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THE BUILDERS' JOURNAL

AND ARCHITECTURAL ENGINEER

APPEALING TO THOSE ENGAGED IN

THE ART OF BUILDING.

IT is our aim, our ambition, our aspiration even, to build our Journal worthily and well, not for the hour only, but for future years; for the few men in the forefront of an enduring and a laborious art; for the disciplined ranks of a distinguished profession; for the young men—Architects to be—and for all who love a clustered column or a flying buttress, a traceried window or a Greek frieze; for the man, too, who honestly plumbs a jamb . . . .

6, GREAT NEW STREET,
LONDON.

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See also indices to "Fire," "Contractors'" and "Concrete and Steel" Supplements.

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Standard Specification for Steel. The Engineering Standards Committee have just published a British Standard Specification for structural steel for bridges and general building construction. The standard lists of rolled sections for structural purposes was published some time ago. This present specification deals with the process of manufacture to be employed, the standard sizes and shapes of test pieces, and the tests to which they shall be subjected. The specification will no doubt meet with the approval of architects. The sectional committee on bridges and general building construction which has drawn up this specification submitted the draft to the Science Standing Committee of the Royal Institute of British Architects, and as a result of this co-operation certain modifications were made. The specification was adopted by the sectional committee on May 23rd, and the report was approved by the main committee on June 19th. The chief points in the specification are briefly as follows:—Plates and rivet bars and sectional material for bridges can be made by the open hearth, acid or basic processes, but must not show on analysis more than ·06 per cent. of sulphur or phosphorus. Sectional material for building construction may, however, be made by the Bessemer process in addition to the others above referred to, but while it may not show a greater percentage of sulphur than stated above, the percentage of phosphorus may be increased to ·07. Plate sections and bars should be free from defects, and they must not vary from the calculated weight more than $2\frac{1}{2}$ per cent. above or below. The standard test-pieces should be cut lengthwise or crosswise in the case of plates and lengthwise in the case of sectional material and bars. They should be similarly and simultaneously treated with the material before being tested. None of the material is to be despatched from the works until the tests have been made by the representative of the architect, engineer or purchaser, and the mill sheets signed by him. Illustrations and particulars are given of the standard test-pieces. For plates and sectional material the steel is required to show a tensile breaking strength of 28 to 32 tons per sq. in., with an elongation of not less than 20 per cent. Bend tests only are required for material under $\frac{5}{16}$in. thick. Rivet bars are required to show a tensile strength of 26 to 30 tons per sq. in., with an elongation of not less than 25 per cent. They may be tested the full size as rolled. One tensile test is to be made from every cast, or every 25 tons, whichever is least. For both the cold bend and the temper bend tests the material must withstand, without fracture, being doubled over until the internal radius is not greater than $1\frac{1}{2}$ times the thickness of the test-piece and the sides are parallel. Bend tests may be made by pressure or by blows. Such tests are not required for rivet bars; rivets are tested by bending the shanks cold and hammering until the two parts of the shank touch each other without fracture on the outside, while the heads of the rivets are required to stand being flattened when hot until their diameter is $2\frac{1}{2}$ times the diameter of the shanks, without cracking at the edges. All plates and sectional material is required to be branded with the maker's name or trade-mark, the place where made, and with number or identification marks by which they can be traced to the cast from which made. With small pieces a metal tag attached to the bundle is sufficient. The representative is to have free access to the works at all reasonable times and to inspect the manufacture at any stage. The material for testing is to be supplied free of charge and the maker is required to supply the testing appliances and labour, or if facilities do not exist at the works, to bear the cost of carrying out the tests elsewhere. Where no inspection takes place at the works the maker must supply to the purchaser a signed test sheet giving the results of the mechanical tests, and, when required, the analysis of each particular cast.

A Record of the Congress. In our issue for last week we referred to the exhibitions which are to be held in connection with the International Congress of Architects, which opens on Monday, July 16th, and continues throughout that week. These exhibitions, we may again remind our readers, will consist, firstly, of photographs and models of notable buildings in this country and, secondly, of photographs of modern work by living British architects. We referred to the highly interesting nature of these exhibitions as forming a history of English architecture superior to any that has ever been attempted before. It is satisfactory to know that there will be some permanent record of these exhibitions. We still hope, however, that this collection will not be seen for the first and last time at the Congress, but that it will become a permanency. Nevertheless, even if the collection is not available for future students of architecture, the record will not be lost; for our contemporary, THE ARCHITECTURAL REVIEW, has arranged to publish many of the photographs that will be exhibited, together with a short historical résumé written by Mr. E. S. Prior, Mr. J. A. Gotch and Mr. Mervyn Macartney, who, it will be remembered, are partly responsible for the collection and arrangement of the historical exhibition. The number will also contain reproductions of the models of St. Paul's Cathedral (Wren's first design), and other interesting models which have been lent to the Congress Committee, as referred to in our note of last week. In the same issue of THE ARCHITECTURAL REVIEW there will be a catalogue raisonné of the exhibits. This should be of great value, as it will give information that can only be obtained at present by laborious research in a number of books. This catalogue will contain lists of the various authenticated works of the various masters of architecture, and also of the works which have been ascribed to them, but which were probably designed by their pupils or their imitators. In addition there will be a number of reproductions of photographs of fine examples of architecture that have never before been published; these have been specially taken for this number. It is obvious therefore that the "Congress Issue" of THE ARCHITECTURAL REVIEW will form the most compact illustrated history of British architecture that has yet been published, besides constituting a most valuable souvenir of the first International Congress of Architects held in England. We feel its importance warrants reference in these columns. The number will be published on July 17th, and the price will be 5s.

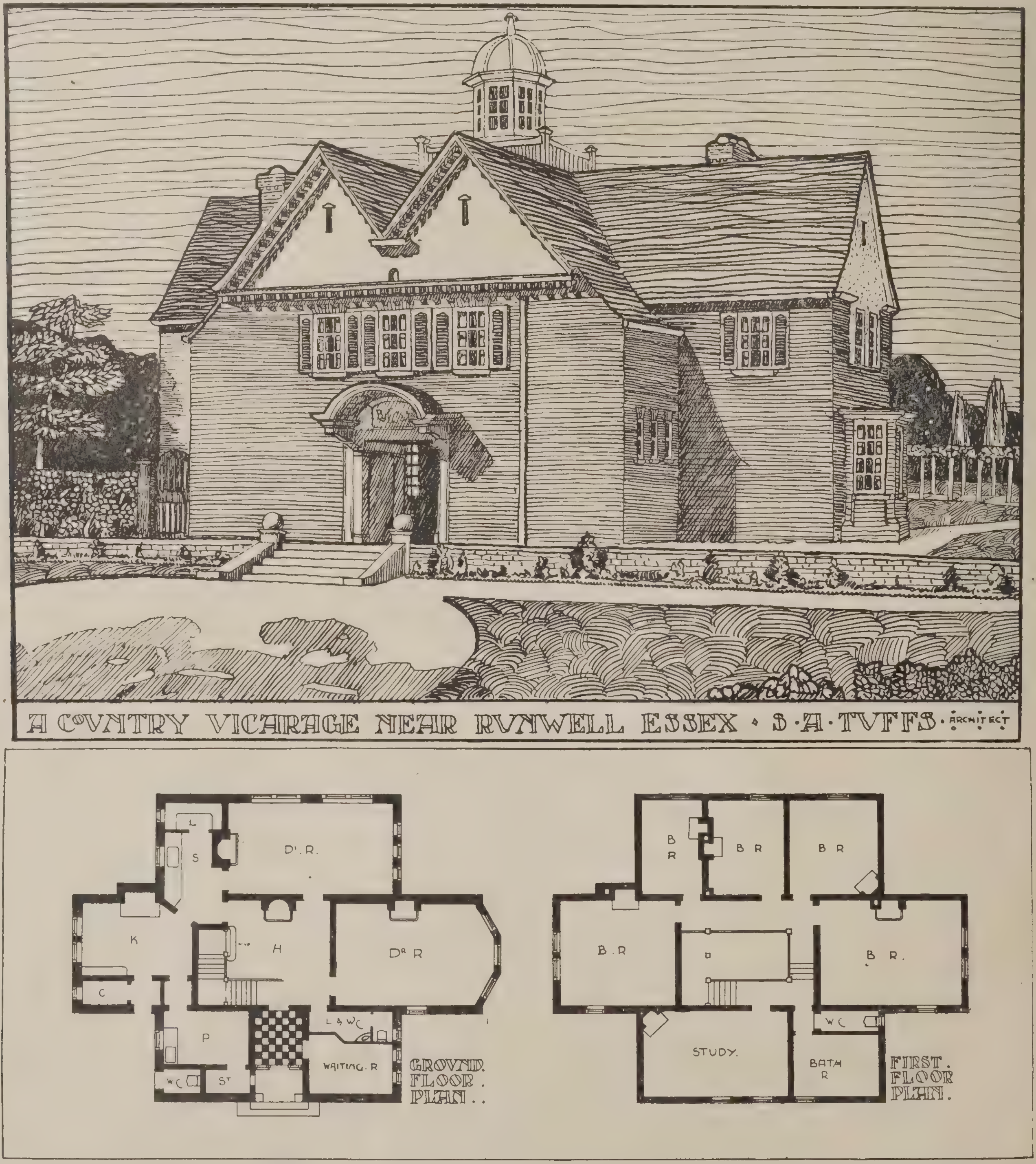
THE TWO METHODS OF DESIGN.

THE June issue of the "Architectural Record" of New York contains a very interesting article by Mr. Russell Sturgis on "School and Practice Designing." First there is, he says, the method common throughout the United States, namely, the following very closely of certain types which are embodied in Italian buildings of the sixteenth and seventeenth centuries, and are laid down in Italian, French and English books of different periods: this method having for its primal and originating force a close study of Roman colonnades, Roman proportions, Roman ornamentation.

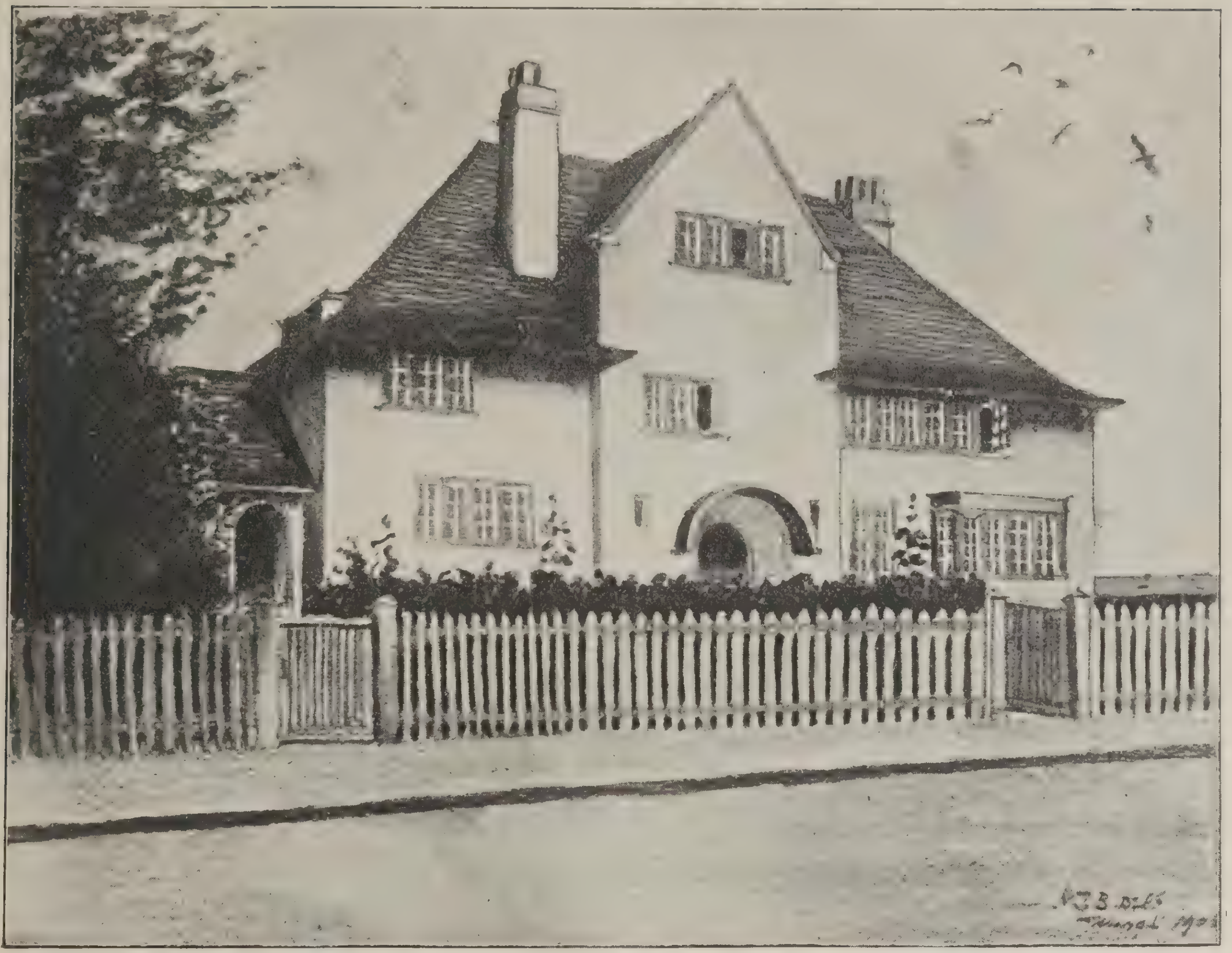
"Many of us heard a member of one of our great architectural societies state in a speech, and dealing with a building of his own, that 'he knew the details were good Renaissance because they were taken right of the theatre of Marcellus'—which is an ancient Roman building of the prime. The English, and American writers following them, spoke of any modern building as 'Renaissance,' using the word as an adjective. The English Renaissance was supposed to include St. Paul's and Somerset House, while the Renaissance in France covered the *Ecole Militaire*, built in 1751, and even the Panthéon, twenty years later, at the very door of the Revolution."

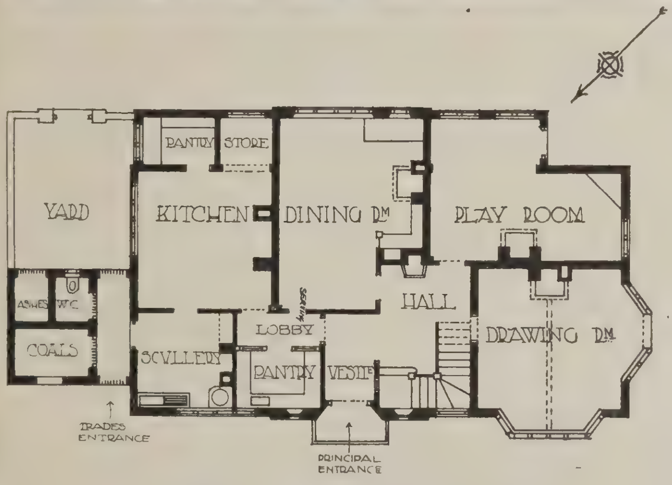
At all events, says Mr. Sturgis, the above is an attempted description of a certain method of designing, a method based upon authority, although the "authority" is of doubtful origin in many cases.

A Man who builds Roman Colonnades may very well be uncertain whether he is following the temple of Mars Ultor, restated for him by photographs from the ruin, or whether he is following the plates in some folio on his office shelves, and purporting to represent that great work of Augustus. The man who is designing, in a sense, Greek anthemions and Ionic capitals may well be uncertain whether they are the plates of Stuart & Revett which he is following or a memory helped by a photograph of some part of the Erechtheum. "The English are inclined to follow Palladio, who died in 1580. The French are more inclined to study the works of Vignola, who died in 1573. To a certain extent the architects of our time are influenced by much more trustworthy representations of Greco-Roman buildings. To a very great extent they are swayed by their own memories of the years spent in the school of art in which they were taught, and by the *projets*—the school-competition

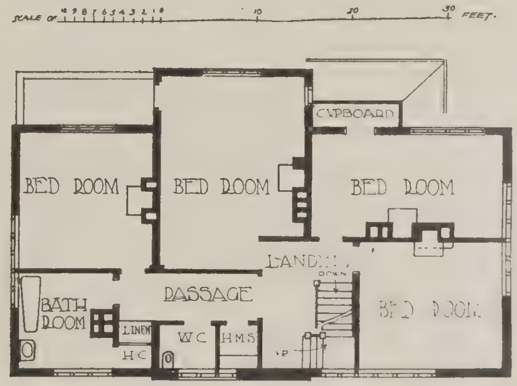


This vicarage is designed to be executed in local red bricks, rough-cast in gables, and roofed with green slates. Timber porch constructed of teak, with top of hood covered with lead. Shutters painted green, other woodwork white. The accommodation provided includes a central hall (lighted from above), with dining- and drawing-rooms, waiting-room and lavatory, and the usual offices on ground floor; while on the first floor there are study, lavatory and bathroom, and five bedrooms. The architect is Mr. S. A. Tuffs, of 42, Horace Road, Forest Gate, E.





The GROUND PLAN.



The CHAMBER PLAN

HOUSE AT BRIDLINGTON, YORKS. HERBERT T. BUCKLAND AND E. HAYWOOD-FARMER, ARCHITECTS.

This house is modelled upon one erected by the same architects at Edgbaston some years ago. The instructions were to build a house as nearly as possible like it in external appearance and plan. The difference in aspect and view, and other circumstances, necessitated the complete turning round of the plan, and certain rearrangement of other portions. The walls are built of brick, rough-casted externally with Portland cement, the roofs being laid with Hartshill sand-faced tiles. Internally the plaster is finished with a wood float, and distempered. The joinery throughout is of red deal painted, with the exception of the dining-room, which has panelling in English oak round the ingle-nook. The total cost will be from £1,150 to £1,200.

lesigns which they made in those sunny days f youth. The Frenchmen who came to hicago in 1893 exclaimed with one voice, vhen they saw the plaster façades surrounding the Court of Honour, that those were the ame old *projets d'Ecole* – and so they were."

That, then, is one method of designing.

The other Method

onsists in summoning up from the resources f the memory such architectural forms as eem best fitted to the larger task about to be imposed upon the designer. The constructor has only the safety of his work to consider: the architectural artist has to think in terms of architecture as well, and to use them in a new composition. This is the free method of designing. "If the designer has a great public library to build, it will not enter very seriously into his scheme that a great and very costly colonnade should form the whole principal front of it, using up a space of 6,000 sq. ft. of the precious city plot, and giving nothing in return except an out-of-door shelter which ten people a month may use in the hot weather, or might use if police regulations would allow. It is not so that he will go at his task. He will think, rather, of how he may provide a spacious interior. It is true also that he will be thinking all the while of what his exterior will be like; but he will recognize that exterior as a dependent part of the work—a result of the interior. And the result he obtains will be then less grandiose but more intelligible; far less costly in proportion to the result, much more expressive of the purpose of the building; and incomparably more original."

To call the first of these methods the traditional one is to deny the use of that term to the second method; and yet the second method, the free method, may be traditional also.

The School Idea.

Let us try the effect of the terms "school method" and "practice method" as descriptions of the two methods of design. The one is that which (for our sins) is mainly taught to the young architects of the period in their schools. They are taught in this way because no other way is so convenient. You are a professor in a school of architecture; you have to submit a problem to a class. It will be very much easier for you to say, "Let us design a pavilion by the waterside, not to exceed so many feet in dimension"—much easier to say this than to give the requirements of a private man about to build a small country house, or of a church committee about to undertake a small village church. But the pavilion by the waterside runs inevitably to grandiose reminiscences of the splendid European monuments shown in the books, which are, of course, at the disposal of the designer, or which have been at his disposal. The different designs for it can be compared with relative ease. The accuracy, according to the accepted authority, of the Ionic or the Roman Doric colonnade, its accuracy in general proportions and in the larger and the smaller details, according to the standard of this, that or the other recognized authority, is easy to decide.

It is therefore not amiss to call the first the school method, or school designing. In like manner it may seem rather obvious why the term "practice designing" is used for that other method.

There is no reason why school designing should be almost entirely identified with the different neo-classic styles. It is merely the fashion of the day to try to design as the Italians of the seventeenth century designed, or perhaps as the strong men of France at a later time faced their problems. "In England, fifty years ago, and at a later time than that, the fashion was altogether different, and so far as there were schools of architecture, there and then, they taught Gothic church architecture, almost to the exclusion of other styles. This is reflected in the English books of the day, of which there are many, devoted to the mediæval styles almost exclusively, and to the English styles in the main. In France the classical feeling has always been very largely traditional in the best sense, for the strong artistic leaning in French society has sufficed to make the changes of the Revolution less fatal to the continuous growth of art in the very country of the Revolution than they have proved to be in other European lands. But the teaching of neo-classic art in France is a very different thing from that of the United States. Even the teaching of the art is not wholly in the direction of school designing. There are some of the *ateliers*, or working studios connected with the Ecole des Beaux Arts, in which a rather serious attempt is made to build up a wholly modern system of design; with a classical origin and under classical influence indeed, but without a close adherence to classical forms."

On the other hand, if we were to substitute for our term "practice designing" some such term as designing in the mediæval spirit, we should belie and contradict the facts of history; for there can be no doubt that the people of Greco-Roman antiquity designed as freely as the people of the twelfth century after. The difficulty is that we do not know how those Greco-Roman designers did their work, except in the huge public monuments where cost was disregarded, where splendour was the one thing required. We have no idea at all of the way in which a Roman of the first century would have looked at the problem of a street front; nor do we know how he would have treated a country house with many rooms, if smaller than those conceived by the great millionaires of the metropolis, when building their villas at Tibur, or at Tusculum, or on the Bay of Naples. It does not help us much for our daily duty as architects to know the way in which an Imperial villa was distributed. And, as for the street front, when Viollet-le-Duc was considering, about 1870, the subject of Human Habitation in all Ages, he was compelled to base his own design for a Roman five-storey house, and for a six-storey house across the way, so closely upon what he had seen in different parts of modern Italy that the selection and combination of the details is a little laughable, although one accepts to the full the sincerity and the intelligent reasoning of that most dexterous of the restorers of the past.

NOTES ON COMPETITIONS.

Holborn Borough Offices.

At last week's meeting of the Holborn Borough Council the Establishment Committee reported that they had considered the six designs for new offices which had been sent in by the six architects invited to compete, and they were of opinion that the best to suit the requirements of the council was the design numbered 1. The estimated cost of the building was £19,205. It was decided to exhibit the whole of the designs in the council-chamber, and to consider the report of the committee at the next meeting of the council, to be held to-day. Designs Nos. 5 and 6 were placed second and third respectively. The names of the authors are not yet disclosed.

Carnegie Library, Northampton.

The local architects at Northampton have addressed a petition to the mayor and members of the town council in reference to the proposed Carnegie library to be built in their town at a cost of £15,000. They ask that all architects practising in Northampton be invited to submit competitive designs, and that the competition be limited to themselves. The borough engineer, Mr. Alfred Fidler, has prepared a design for the building, and it is against this the petition of the local architects is particularly directed. A correspondent sends us an illustration of the front elevation. It is not blatant, but merely dull and stodgy. The architects of Northampton claim to do better, but the special point with them seems to be one of principle—that borough engineers should not be entrusted with work of this class. With that claim we are in entire agreement. Borough engineers may be very good engineers (but with few exceptions) they are very bad architects. Of course some "architects" are just as bad, but they are very much more fitted as a class to undertake architectural design. At the meeting of the Northampton Town Council held on Monday this matter of the Carnegie library came up for discussion. At the time of going to press we have not heard the decision of the councillors, but as the design for the library was put in the hands of the borough engineer with the special object of saving money, we shall not be at all surprised to hear that his effort is to be approved, and that the local architects can retire to spend their wrath among themselves.

Library at Swadlincote.

The award of the assessor, Mr. Thomas Cooper, F.R.I.B.A., of Birmingham, for this building is:—First premium (£25), Mr. A. Macpherson, Derby; second (£15), Messrs. Walton & Thomas, Tamworth; third (£10), F. B. Cooper, Leicester.

Competitions Open.

The following is a list of competitions open:—

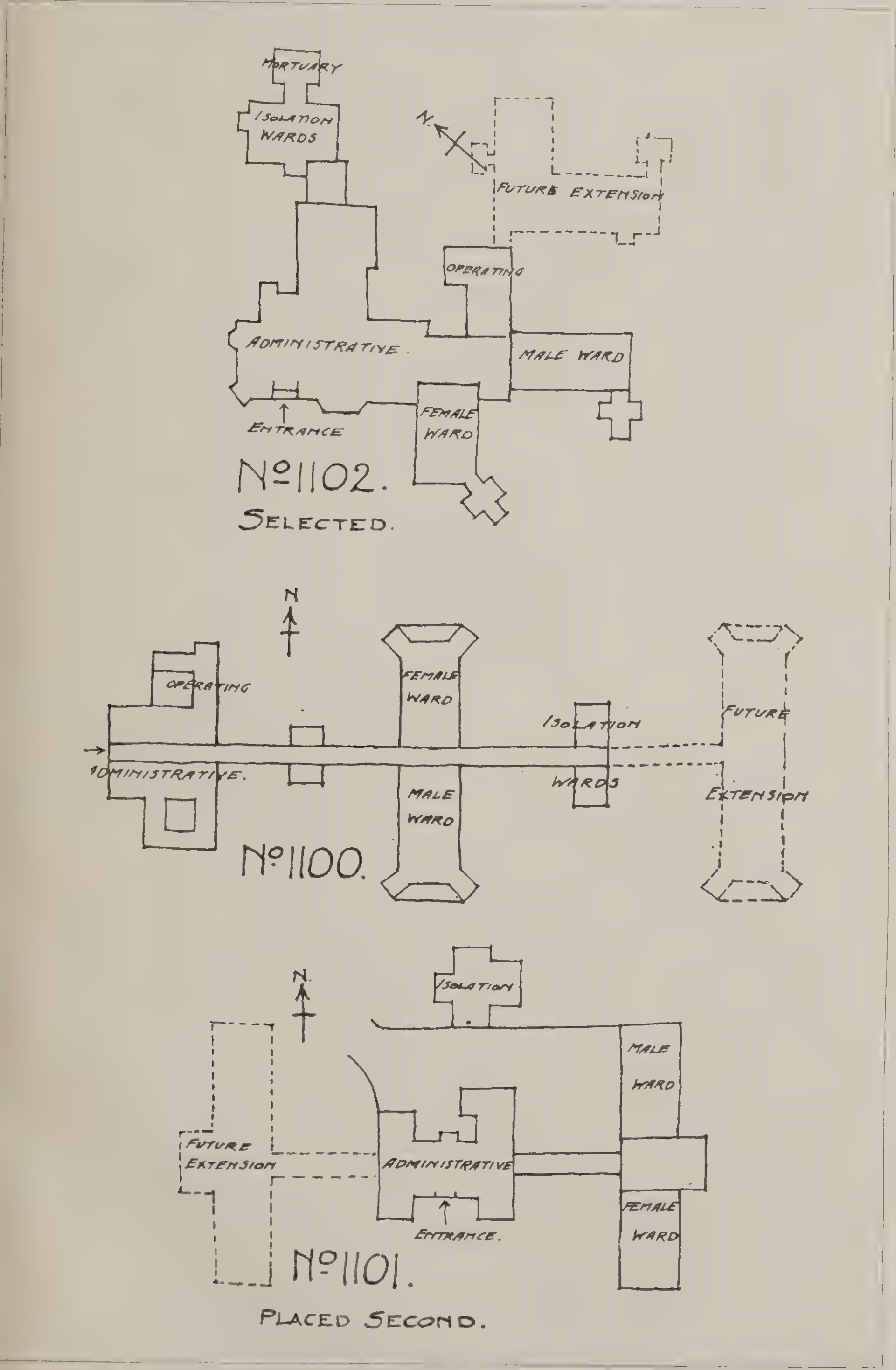
DATE OF DELIVERY.	COMPETITION.
July 4	SCHEME OF SEWERAGE AND SEWAGE-DISPOSAL WORKS AT WARBLINGTON. Premiums of £100 and £50. Particulars from Mr. J. W. Loader Cooper, clerk to the U.D.C., Queen Street, Emsworth.
Oct. 1	ALPHABET COMPETITION. Prizes of £20, £10 and £5. For particulars see "Architectural Review."
„ 31	BOURSE AT CAIRO.—Premiums of £E250 and £E100. International competition. Designs to be submitted to the "Corporation des Agents de Change," Cairo, Egypt.
—	NEW MUNICIPAL BUILDINGS AT STIRLING (to cost £12,000). Premiums of £100. Particulars from Town Clerk, Borough Buildings, King Street, Stirling.

St. Pancras Library.

Mr. Belcher will shortly be making his award in this competition.

Finchley Cottage Hospital.

If the object of a competition be to obtain the best scheme, by careful selection from a number of designs illustrative of the ingenuity and skill of an equal number of architects, the Finchley Hospital Committee may be said to have failed in attaining it. If, on the other hand, a competition be intended to serve one or other of those numerous and mysterious purposes the objects of which are incomprehensible to any but the initiated, then Finchley may be congratulated on the complete success of its venture. This is the conclusion which must have forced itself upon the minds of impartial observers of the five sets of drawings which have recently been on view in the council's schools. The sub-committee appointed to report on the designs consisted of Mr. E. A. Woodrow, F.R.I.B.A., Chairman of the General Committee, Dr. Lazarus Barlow (of Middlesex Hospital), Chairman of the Medical Committee, and Mr. W. H. Cross (late of St. Bartholomew's Hospital), Chairman of the Building Committee. The competitors were nominees of the sub-committee and were selected, so it was understood, on account of their experience in hospital planning. The inclusion in the committee of an architect of some standing inspired confidence that the interests of the competitors would not lack a champion. It is but fair to assume that the medical view has outbalanced the architectural one, and once again is proved the futility of a form of assessing which contains, as one of its elements, the lay opinion. The following are the names of the competitors and the numbers with which their designs were distinguished:—1100, Messrs. Russell & Cooper; 1101, Messrs. Young & Hall; 1102, Mr. E. B. I'Anson; 1103, Mr. A. O. Collard; 1104, Messrs. Yetts, Sturdy & Usher. Design No. 1102 is the selected one, and No. 1101 is placed second. The site is a rectangular one measuring about 368ft. from west to east, and 240ft. from north to south. A road exists on the western boundary, and it is proposed to make another on the eastern boundary. The conditions required a cottage hospital of twenty beds, ten for males, eight for females, and two for isolation cases; sleeping accommodation for the staff; an operating room with north and west lights and top light; ante-room, committee room, matron's sitting-room, nurses' dining and sitting room, box-room, surgery and dispensary, and mortuary. The cost was given at £4,500, to include building, fittings, fencing and gates. The selected design is a bewildering arrangement of wards and rooms suggesting, in the block, a country house with numerous wings which have been added from time to time according to the whims of its owners. The building is badly placed as regards aspect, and the accesses to the isolation wards and future extension are most unsatisfactory. The elevations are as bewildering as the plan. The design placed second shows decided evidence of a knowledge of hospital planning, and the award of twenty guineas obtained by its authors, in compliance with the conditions, as being the second best design, is fully justified. By far the best scheme, however, is No. 1,100, and why it has been relegated to oblivion is one of those mysteries to which reference has been made. The entrance is approached direct from the existing road. The wards, administrative departments, &c., are symmetrically placed on either side of a central covered way. The general scheme is designed to render the present portion complete in itself and to permit of the extension being executed without disturbance. The administrative block faces the existing road, and the ward blocks have their long axes north and south so that they may receive the maximum of sunlight on all sides. The ward offices and ablution room are placed in two blocks at the end of each ward, where they do not interfere with light or air; they are cut off from the wards and cross-ventilated. These are arranged in such a manner that a spacious verandah occupies the intervening space at the end of the wards, through which patients can obtain access to the grounds. The administrative offices and the operating room are all conveniently placed, and the bedrooms upon the first floor of the administrative block are comfortably arranged. The buildings are designed in a simple domestic type with Georgian feeling emphasising the institutional nature of the building, but retaining at the same time the character of a cottage hospital. The three plans commented upon are here illustrated in outline blocks with sufficient information marked on them to render comparison easy. A letter of protest against the award has been written by a competitor to the hon. secretary of the Hospital Committee, to which the following reply has been received: "In reply to yours of to-day's date, I beg to remind you that you accepted the conditions of the competition."



FINCHLEY COTTAGE HOSPITAL COMPETITION.

Correspondence.

Norwich Shirehouse Competition.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—I note in your last issue that the tenders for the above work correspond very closely to the "architect's estimate," but this latter is a very different figure from that submitted by the same architect when his plans were sent in! How do the Norwich ratepayers feel about such an absolute fulfilment of the prophecy in your issue for January 17th? —Yours truly,

"JUSTICE."

Stone Preservation.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—On p. 314 of your issue for June 13th there is a paragraph under the heading of "Stone Preservation" which has reference to Mr. Alexander Muir's report upon the treatment of the Glasgow municipal buildings with "Szerelmey stone liquid." The wording of the second part of the paragraph, "although some stones are showing decay since they were treated, yet Mr. Muir considers they should have been cut out and replaced by new masonry," may, we think, convey an erroneous impression of the actual facts. It should be made clear that these stones were of inferior quality, and should not have been placed in the building. Mr. Alexander Muir's opinion as to the treatment is expressed in the concluding remark in his report, namely, "Looking over the whole building I see nothing even to suggest that the treatment is likely to prove anything but a thorough success."—Yours truly,

N. C. SZERELMEY & Co.

LONDON.

Professional Assessors.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—It is really refreshing to find a man who has had so much to do with competitions as Mr. Bonner letting himself go in print as he does in your issue for June 20th, and it is an interesting coincidence that Mr. Gammell should be tilting at the same windmill at the same moment within the sacred walls of No. 9, Conduit Street itself.

That the conduct of competitions will be a subject for acrimonious discussion so long as there are successful and disappointed architects is, I think, certain, but it is a hopeful sign when attacks on the system and its development on the lines laid down by the Institute come from the inside of that body.

I am entirely in sympathy with both Mr. Gammell and Mr. Bonner, but I think it is probably a mistake to assume that there are more Martin Chuzzlewits than Pecksniffs in the world. That the former do exist, with some years' more training than Pecksniff seems to have had, is obvious, but the class is not numerous. That there are many of the latter, however, no man of experience in the profession will deny. I know one notorious member of the family whom both Mr. Bonner and I have served in the past. He was a F.R.I.B.A. and once figured in your series of "Men who Build." I believe I am safe in saying that during the whole course of his professional career (he joined the majority some time since) he never made a single design, although he enjoyed an income, in my time, of about £3,000 a year from his practice, which was almost entirely the result of competition work gained for him by others.

Does not such an instance form a strong argument for registration, which would give a governing body powers to deal drastically with such men, instead of being, as the Institute is and always has been, an impressive-looking animal with its teeth drawn.

I have not indulged much on my own account in competitions, but when I did my experience of the Institute assessor was discouraging. Here is an instance. A work to cost £5,000 was awarded to a man whose design, cubed at a low figure—4d., I think—worked out at £10,000, and the lowest tender subsequently obtained exceeded that amount. Result: scheme abandoned.

With regard to unlimited competitions, I remember in my personal experience about 450 designs sent in for a small job. Result: most commonplace design accepted, to the accompaniment of howls of indignation from all the building journals.

I believe registration—or, in other words, a close profession—is the only cure for the ills from which we suffer, both from unsatisfactory competitions and adventurers of the Pecksniff order, as in the first place it would give the public a respect for the architect which at present it does not feel, and would consolidate the profession so that in matters of competitions it could enforce that respect, while in the other case it would strike off the rolls men who traded upon other men's brains and were guilty of dishonourable practices.

Though, for my part, I doubt if a finer design could have been obtained than that which Sir Aston Webb has produced for the Victoria Memorial, still I do not think it can be denied that for a national memorial the principle of the open competition is the right one; but that all competitions should be unlimited is, I think, an absurdity, and likely to be productive of most undesirable results.

Is it too much to hope that the Institute will drop its dog-in-the-manger attitude towards registration and, for the sake of the profession it claims to represent, put its back into the work and get the necessary Bill through Parliament? I trust not—Yours truly,
R. W. SAMPSON.

SIDMOUTH.

The A.A. Evening Studio.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—My attention has been called to the comment on the above in your issue for last week. In a letter received by me on April 4th last, the A.A. Council write: "It has been definitely decided to amalgamate the evening studio with the evening school, as it is evident that the evening studio can never be self-supporting now the day school is so firmly and successfully established. While there is an increased attendance at the day school, it follows naturally that the entries for the evening studio must decrease. The Council has therefore come to the conclusion that this change must be made after the close of the current session."

From this I understand that the evening studio has ceased to exist, and students would be asked to join the evening continuation school, which was established to carry on the work of the day school. I therefore hope you will see your way to inserting this letter in your next issue, as I think that the statement I made was a perfectly fair inference from the Council's letter: the fact that students of the evening studio are now invited to join the evening continuation school only emphasizes the accuracy of my conclusion.

I invited the hon. secretaries to attend the last meeting and state what provision would be made for students to carry on their work. Had this been done the matter would have been clear.—Yours truly,
WILLIAM G. B. LEWIS.

LONDON, N.E.

TWO NEWCASTLE BUILDINGS.

ON his visit to Newcastle-on-Tyne next week His Majesty the King will formally open two important new buildings just completed there. These are the new infirmary and the Armstrong College extension. The architect of

The New Infirmary

is Mr. H. Percy Adams, F.R.I.B.A., with whom is associated Mr. W. Lister Newcombe, F.R.I.B.A., of Newcastle. The general scheme comprises an administration building centrally placed, with eight ward pavilions grouped on either side, and the usual other buildings disposed about the site. The main front faces the Leazes Park. The ward pavilions are two storeys high and are arranged with the surgical wards (and operating theatres) on the ground floor and the medical wards on the first floor. The central hall of the administration block is panelled throughout with teak and leather, with plaster enriched ceiling and emblazoned arms on the windows. On the highest part of the site is the nurses' home, a fine block providing eighty bedrooms for nurses and six for housemaids. The ward pavilions are not less than 80ft. apart, and being axially north and south secure a maximum of sunlight and air. All the large pavilions are similar in detail, being designed for twenty-four beds each. Next to the entrance of the ward on one side is the ward kitchen and on the other the sister's room; a day room with bay window is provided to each ward, also two single-bed wards, examination room, linen-room, small larder, and a room for patients' clothes.

The ward walls are lined with pale blue tiles to a height of 5ft., cemented above and finished with enamel paint. Floors are laid with teak blocks, wax polished, and all angles and corners rounded. The windows have double-hung sashes with a low deep rail so as to ventilate at the meeting rail, with a hopper above having glass sides. At the end of the wards on one side are the bathrooms and on the other side sink rooms and w.c.'s, these annexes being cut off by cross-ventilated lobbies. Each large ward is 102ft. by 27ft. by 13ft. high, containing 35,802 cub. ft., or 1,500 cub. ft. per bed. The wall-space is 8ft. from centre to centre of the beds. The children's wards are only 24ft. wide, and the walls are lined with tile pictures. The wards are heated by open stoves and hot-water radiators; exhaust flues are arranged next the ceiling, each ward having independent flues.

The large operating theatre is octagonal in shape and has a marble gallery for students entered from the main first-floor corridor; underneath is a lecture theatre accommodating 100 students.

Perhaps the most successful part of the whole scheme is the chapel with its dome lined with gold mosaic. The library is also admirably designed.

A special series of thirty full-page illustrations of the new infirmary will be included in THE ARCHITECTURAL REVIEW for July, ready on Monday next.

The Armstrong College.

The other building to be opened by His Majesty is the extension of the Armstrong College, between the Leazes Common and Barras Bridge. This extension comprises the principal front, 300ft. in length, with the Sir Lowthian Bell Tower (120ft. high) and the examination hall. The buildings are four storeys high. The examination hall, 70ft. by 50ft., is on the ground floor, while on the first floor are the library (60ft. by 45ft.) and various classrooms, with other classrooms and laboratories on the floors above. Mr. W. H. Knowles, F.S.A., of Newcastle, is the architect for the work, and Mr. T. Lumsden the builder, the contract amounting to more than £50,000. The first portion of the college was opened in 1888, comprising the north-east wing; the south-east and south-west wings having been opened in 1894. The north-east wing contains the Herschel physical laboratory, the Johnstone chemical laboratory, the Armstrong electrical laboratory, &c.; the south-east wing includes the Royal Jubilee Exhibition tower; and the north-east wing accommodates the George Stephenson engineering laboratory.

ARCHITECTS IN RUTS.

THERE is always a big difficulty in trying to get life into anything technical, but somehow or other the Americans seem to "get there" very often. Here is an example of the latest we have come across, from a paper which we have never heard of before—the "New York Commercial":—

Architects certainly run in ruts, but then who does not? A certain form of plan of a house, and well suited for a certain locality, happens to strike the fancy of a man. He likes it and tells his architect so, and that gentleman is going to work that plan for the remainder of his days. He is going to work it in the country, in the city; he is going to try to make a church out of it, or a bowling alley. There seems to be little resourcefulness in the composition of the average practitioner. He runs in ruts, and besides that is inconsistent in little things and in big things. If he happens to see some glass effects, for instance, that please him, he goes daft on glass effects, and puts some particular glass decorator upon every one of his clients, and the result is that you will see a lot of buildings literally plastered over externally and internally with glass mosaic, stained glass, glass everything. Or it will be iron, and then you will have grilles and wonderful interlacings of iron, and in the most unforeseen and extraordinary places.

The Little Inconsistencies.

Not only is there lack of real taste in this thing, but gross inconsistency. For instance, how many houses will you see in the city with front windows, even the basement ones, beautiful expanses of plate glass, absolutely unprotected? Then, right alongside of them will be the doorway, with perhaps two dimunitive windows lighting the hall flanking that doorway. The glass in the door and in the windows, yes, even in the transom over the door, will be most artistically protected with bristling, spiked and riveted and strongly welded iron or bronze gratings. Some think it pretty, but the natural purpose of all this protection would seem to be to keep out burglars and uninvited guests. What keeps them out of the other windows?

Architects on Hire.

The profession has made great strides, but a lot of its practitioners certainly are behind the times, with scant resourcefulness. And this has its effects upon the people. They are not satisfied. They study and observe and are getting into the notion of trying to find out for themselves what they do want and what is the proper thing, and the result is that many a man or woman makes his or her own plans and "hires an architect to design a front."

It is only a question of time when he will be dispensed with for even that. There was a time, and still is occasionally, when an architect is high lord executioner and everything else on a building, but in probably one-half the big building projects to-day the owner deals very directly with prominent construction companies and has an architect to do a portion of the technical work and visit the building as more or less of a formality: and it would also seem to be but a question of time when such companies will employ their own specialists, designers, &c., and the architect as an independent practitioner will be a matter of bygones, a sort of Anno Domini affair. It really behoves the the profession to wake up.

NEW LONDON BUILDINGS.

AT yesterday's meeting of the London County Council the Building Act Committee reported the following applications under the London Building Act, 1894, their recommendations as to consent or refusal being appended in *italics* :—

Extension of the periods within which the erection of detached houses on the east side of Mycenæ Road, Westcombe Park Road, Greenwich, was required to be commenced, on the application of Crickmay & Heath. (*Consent.*)

Wood and glass conservatory over the entrance porch at No. 1, College Terrace, Fitzjohn's Avenue, Hampstead, without the walls under such conservatory being thickened, on the application of R. Smith & Son, on behalf of Dr. H. Roger Smith. (*Consent.*)

Two-storey building in front of No. 2, Loampit Vale, Lewisham, on the application of Stocker & Roberts, on behalf of A. C. Coates. (*Consent.*)

Wooden porch in front of No. 50, St. German's Road, Forest Hill, on the application of S. C. Haine, on behalf of J. Taylor. (*Consent.*)

Deviation from the plan approved on 17 October, 1905, for the erection of a projection stone porch and balcony at No. 51, Upper Brook Street, St. George, Hanover Square, so far as relates to the erection of glass screens at the sides and iron gates in front of the porch, on the application of R. G. Hammond, on behalf of J. Garlick. (*Consent.*)

Porches in front of houses in Stapleton Road, Wheatlands Road and Tooting Bec Road, Wandsworth, on the application of W. C. Poole, on behalf of F. Eaton. (*Consent.*)

Retention of a showcase in front of No. 18, Beauchamp Place, Brompton Road, Kensington, on the application of Pauline & Co. (*Consent.*)

Additions to No. 24, Cottesmore Gardens, Kensington, to abut upon Stanford Road, on the application of F. E. Williams, on behalf of F. Arnold Baker. (*Consent.*)

Retention of a conservatory addition at the rear of No. 179, Hither Green Lane, Lewisham, to abut upon Ennersdale Road, on the application of F. N. Shillingford. (*Consent.*)

Bakehouse at the rear of No. 1, Central Market, Stanstead Road, Catford, to abut upon Fermor Road, on the application of Norfolk & Prior, on behalf of E. W. Hodge. (*Consent.*)

Oriel window at No. 60, Fenchurch Street, City, to abut upon Fenchurch Street and London Street, on the application of J. S. Gibson, on behalf of J. Carmichael. (*Refusal.*)

Two storey building with stable at rear on the southwestern side of Moyser Road, Streatham, with the flanks in advance of the line of buildings in Nimrod Road, on the application of H. R. Thorp. (*Refusal.*)

One-storey shop in front of No. 2, High Street, Kensington, on the application of A. Mitchell-Husbands, on behalf of F. W. Bateman. (*Refusal.*)

Projecting shelter at the Hammersmith District Railway Station, The Broadway, Hammersmith, on the application of J. Carter, on behalf of the Metropolitan District Railway Co. (*Refusal.*)

Retention of four one-storey shops in front of Nos. 65, 67, 69 and 71, Westcote Road, Streatham, on the application of J. Harding. (*Refusal.*)

Open wooden porch at "The Lymes," Dulwich Wood Park, Dulwich, on the application of W. Griffiths, on behalf of J. Bowyer & Co. (*Consent.*)

Clock tower in the centre of St. George's Circus, Southwark, on the application of J. F. Groll, on behalf of W. B. & F. Faulkner. (*Consent.*)

Three oriel windows to Nos. 13, 13A, 14 and 15, York Buildings, Adelphi, on the application of Thompson & Walford, on behalf of the Clinical Research Association, Ltd. (*Consent.*)

New out-patients' department and nurses' home at the West London Hospital, Hammersmith Road, with the external walls at less than the prescribed distance from the centre of the roadway of Elm Grove, on the further application of W. Harvey, on behalf of the Committee of the West London Hospital. (*Refusal.*)

New street for carriage traffic to lead from Chatsworth Road to Idmiston Road, Norwood, on the application of C. J. Bentley, on behalf of himself and the trustees of the late Charles Blake. (*Consent.*)

New street for carriage traffic to lead from Idmiston Road to Lancaster Road, Norwood, on the application of C. J. Bentley, on behalf of himself and the trustees of the late Charles Blake. (*Consent.*)

Modification of the provisions of that section with regard to open spaces about buildings, so far as relates to the proposed erection of Nos. 12 and 14, Manwood Road, Brockley, with irregular open spaces at the rear, on the application of H. Lillywhite. (*Consent*)

Buildings abutting upon a proposed street for foot traffic only, to lead from Southampton Road to Vernon Place, Holborn, the said buildings to exceed in height the width of such proposed street, on the application of R. J. Worley, on behalf of the Selected London Properties Co. (*Consent.*)

The Theatres and Music Halls Committee also reported the following :—

Drawings submitted by E. Monson & Sons, showing certain proposed alterations and additions to the St. Clement's Parish Hall, Fulham Palace Road. (*Consent.*)

Drawings, submitted by W. D. Caroe, of the Working Men's College in Crowndale Road, St. Pancras. (*Consent.*)

At last week's meeting of the Council the following applications were reported :—

Retention of a photographer's showcase erected on the forecourt of No. 154, Holland Park Avenue, Kensington, on the application of A. Langfier. (*Consent.*)

Bay window, balconies and porch at No. 1, Albert Terrace, Regent's Park, on the application of S. G. Castleman, on behalf of Sir William Collins, M.P. (*Consent.*)

Buildings on the western side of Thrale Road, Streatham, southward of Clairview Road, on the application of W. Bartholomew, on behalf of Antill & Squires. (*Consent.*)

Retention of a projecting illuminated sign at the "Red Cow" public-house, Hammersmith Road, Hammersmith, on the application of Bull & Bull. (*Consent.*)

Retention of an iron and glass shelter at the Adelphi Hotel, John Street, Adelphi, on the application of Jeffries & Co., on behalf of Flower & Sons, Ltd. (*Consent.*)

Four houses on the eastern side of Garrad's Road, Wandsworth, between Tooting Bec Road and Prentis Road, on the application of J. S. Gibson, on behalf of J. Carmichael. (*Refusal.*)

Shop front in the passage-way leading to the railway arches (Nos. 33x and 34x) on the western side of Brixton Road, Brixton, and the roofing over of a portion of such passage-way, on the application of H. Tanner, jnr., on behalf of S. Sanders & Co. (*Refusal.*)

Shop front in front of the railway abutment between Nos. 456 and 462, Brixton Road, Brixton, on the application of H. Tanner, jnr., on behalf of Sanders & Co. (*Refusal.*)

One storey motor-house and an iron and glass covered way at No. 20, St. John's Wood Road, St. Marylebone, to abut upon Grove Road, on the application of A. W. G. Harding. (*Refusal.*)

Addition at No. 3, Acacia Road, St. John's Wood, on the application of W. R. Phillips, on behalf of J. M. Swan, R.A. (*Refusal.*)

Covered way in front of No. 36, Abercorn Place, St. John's Wood, on the application of J. Danson, on behalf of A. Wood. (*Refusal*)

Retention of four one-storey shops in front of Nos. 65, 67, 69 and 71, Westcote Road, Streatham, on the application of J. Harding. (*Refusal.*)

Retention of the forecourt fence-wall in the front of three houses on the southern side of Bolton Gardens, South Kensington, at less than the prescribed distance from the centre of the roadway of such street, on the application of Cooper & Bake, on behalf of F. G. Minter. (*Consent.*)

Boundary fence at the "Hatcham" school for physically defective children, Canterbury Road, Old Kent Road, at less than the prescribed distance from the centre of the roadway of Wagner Street, on the application of T. J. Bailey, on behalf of the Education Committee of the Council. (*Consent.*)

Further deviation from the plan approved on July 11, 1905, for consent to the erection of a two-storey building on land at the rear of Nos. 20, 22, 24 and 26, St. John's Road, Battersea, with external walls at less than the prescribed distance from the centre of a roadway leading out of the south side of St. John's Hill, so far as relates to an alteration in the height of such two-storey building, and of the addition to such building, approved on March 27, 1906, on the application of E. S. Barr. (*Consent.*)

Working-class dwellings at the rear of No. 184, Camberwell Grove, Dulwich, to abut upon Stories Road, with external walls at less than the prescribed distance from the centre of the roadway of Stories Road, on the application of A. Laycock. (*Refusal.*)

Urinal in Cambridge Mews, Southwick Street, Paddington, at the rear of the "Marquis of Clanricarde" public-house, on the application of W. H. Collins, on behalf of the City of London Brewery Co., Ltd. (*Consent.*)

Retention of an oriel window in front of No. 7, Wood Street, City, at less than the prescribed distance from the centre of the roadway of such street, on the application of W. H. Waterman. (*Consent.*)

Nine houses with shops on the western side of Askew Road, Hammersmith, northward of "The Sun" public house, on the application of F. J. Brewer, on behalf of A. Gard. (*Consent.*)

Retention of an iron sign erected on the forecourt of Nos. 139A and 139B, Finchley Road, Hampstead, on the application of E. T. Morriss & Co. (*Consent.*)

Projecting balconies in front of a proposed building between Nos. 10 and 12, Bosworth Road, Kensington, on the application of Chapman & Shepherd, on behalf of the Bosworth Temperance Club. (*Consent.*)

Open porches in front of Nos. 1 to 23 (odd numbers only) inclusive, Kingsbridge Road, St. Quintin Estate, Kensington, on the application of Trant Brown & Humphreys, on behalf of Daley & Franklin. (*Consent.*)

Projecting bays with gables over, and porches to Nos. 19 to 65 (odd numbers only) inclusive, and Nos. 22 to 44 and Nos. 48 to 70 (even numbers only) inclusive, High Lever Road, St. Quintin Estate, Kensington, on the application of Trant Brown & Humphreys, on behalf of Daley & Franklin. (*Consent.*)

Retention of a greenhouse in the garden of "Hyndford House," Inglemere Road, Forest Hill, Lewisham, abutting upon Bampton Road, on the application of G. Hayward & Co. (*Consent.*)

Houses with shops on the western side of Norwood Road, and dwelling houses on the northern side of Trinity Road, Norwood, on the application of T. L. Fearon. (*Consent.*)

Retention of a projecting iron and glass shelter at the entrance to No. 152, Victoria Street, Westminster, extending beyond the general line of buildings in the street, on the application of G. Odone. (*Consent.*)

Retention of the bases to five projecting pilasters on the Piccadilly frontage and to five projecting pilasters on the Old Bond Street frontage of buildings upon the site of Nos. 44, 45 and 46, Old Bond Street, and Nos. 57, 58, 59 and 60, Piccadilly, on the application of Callard, Stewart & Watt, Ltd. (*Consent.*)

Obituary.

Mr. John Wills, architect, of Derby, died recently, aged 61.

Sir Wyke Bayliss, president of the Royal Society of British Architects, who died on April 5th, left estate which has been proved at £2,640.

Mr. Stanford White, partner in the well-known firm of McKim, Mead & White, architects, was shot in New York on Monday last week.

The late Mr. Joseph Gornall, builder and contractor, of Bolton, who died on September 23rd last, left property which has been valued at £20,000.

Notes and News.

The Palais de Justice, Paris, is to be enlarged.

Messrs. Measures Brothers, Ltd., constructional engineers, of London and Croydon, are paying an interim dividend at the rate of 5 per cent. per annum.

Restoration at Heidelberg.—Protests are being made against the proposals of the Baden Government to renovate the ancient castle of Heidelberg. The suggestion is that a roof shall be put over the ruined building of Otto Heinrich (1556), the finest portion of the edifice, and it is urged that the magnificent façade should be pulled down and rebuilt in detail, but on renewed foundations.

Work Abroad.—The July circular of the Emigrants' Information Office, 31, Broadway, Westminster, states that in New Zealand, at Auckland, the building trades absorb all efficient workmen, but no more are wanted. In Cape Colony the supply of labour is in excess of the demand, and the same applies to Natal. Workmen are warned, too, against going to the Transvaal at the present time in search of work.

Workmen's Compensation.—In the City of London Court last Thursday a bricklayer named Leman claimed £340 from Messrs. Patman & Fotheringham, Ltd., builders, for injuries caused through a brick falling upon him while in their employ on a building in Cheapside. Leman was having his dinner with his fellow workmen when the brick suddenly fell upon him from a board 35ft. above. He was awarded £150 compensation.

South-Western Polytechnic, Chelsea.—The lectures on architectural history given by Mr. Banister Fletcher, F.R.I.B.A., and arranged under the auspices of the University of London Extension Board, held during the past session, have been very successful. The total number of students who entered for the course was sixty. For the next session, which opens on October 1st, a series of visits to important buildings and museums around London is being arranged.

End of the Vienna Building Strike.—The lock-out in the Vienna building trade has been ended, after seven weeks. It affected about 60,000 men and women—women being largely employed in Austria as bricklayers' assistants. Although the employers' ring has successfully resisted the bricklayers' demand for a minimum daily wage of five kronen (approximately 4s. 2d.), it has been obliged to concede 4·66 kronen (3s. 10½d.) for the rest of the current year and the first four months of next year, and to promise a wage of 5·4 kronen (4s. 2½d.) for the remainder of 1907 and the whole of 1908. The highest previous wage was four kronen (3s. 4½d.).

A new Roman Catholic Church at Godalming, dedicated to St. Edmund, has just been completed.

Bruce House, now being completed in Kemble Street, near Drury Lane Theatre, is a kind of "Rowton House," built by the London County Council. It is five storeys in height, excluding the basement, and is built of red brick relieved with Portland stone dressings. Accommodation is provided for 699 working men.

The Queen's Sanatorium.—Plans for this building, to be built at Davos, have now been definitely adopted, the architects being a Zurich firm. The building will provide about sixty beds, with public rooms and offices adapted for eighty or more in addition. The total estimated cost of building and furnishing is £22,000, towards which £17,500 has still to be collected. It is hoped to begin building next spring.

Westminster Abbey: Reparation of Stonework.—Repairs to the outside stonework of Westminster Abbey have just been commenced, and will take about five years to complete. A start has been made on the clearstory of the north transept, where extensive scaffolding is being erected. The decayed Bath stone is to be replaced by Portland stone. Mr. Micklethwaite is the architect in charge.

Architectural Models.—We have received from the London Drawing and Tracing Office, 98, Gray's Inn Road, W.C., a handy little booklet on models of buildings, &c. Mr. John B. Thorp, who makes a speciality of these, has prepared a large number of models for architects, especially of models in connection with light and air cases. His work is carried out in a most careful way, and as the use of models is now becoming so common we have no doubt that many readers will be glad to know where they can get them prepared.

Dry-rot: The Legal Aspect. — In the "Law Times" for June 23rd is an article dealing with the removal of dry-rot, in its legal aspect. A summary of cases affecting the question is given. It is often a delicate point to decide as to who shall bear the expense of remedying dry-rot when it has been discovered, and the cases suggest that the task of getting the Courts to sanction the expenditure of capital for the purpose is not by any means an easy one, except where the work can be brought within the ambit of "alterations" to facilitate letting, or within the limits of the indulgence extended to cases of rebuilding a mansion-house.

Rebuilding of St. George's Hospital.—At a meeting of the governors last week the question of the removal or the rebuilding of St. George's Hospital at Hyde Park Corner was discussed. Mr. A. W. West, one of the treasurers, stated that there were three alternative schemes—(1) To remain where they were, carrying on their work as well as they could, which would cost £37,700; (2) to buy up the leasehold interest of the houses at Knightsbridge, which would cost £120,000; and (3) to rebuild the hospital on the present site, which would cost £350,000. This last has been adopted. Mr. H. Percy Adams, F.R.I.B.A., is the architect for the rebuilding.

OUR PLATES.

Two West-End Houses.

The two West-End houses illustrated in this issue have recently been built on the Howard de Walden estate, for private clients, from the designs of Mr. W. Henry White, F.R.I.B.A., of No. 14A, Cavendish Place, W. No. 27, Harley Street was built by Mr. George R. Shaw, of No. 8, Wigmore Street, W., and No. 25, Queen Anne Street, by Mr. D. Prosser of No. 23, Charlotte Street, W., and in each case the work has been extremely well done. The perspective views are hung in this year's Royal Academy exhibition.

GARGOYLES.

RELATIVELY unimportant compared with many other features of Gothic, the gargoyle has always appealed to popular fancy. It is a detail than can scarcely be overlooked, owing to its position and the grotesque forms it has been made to assume.

There is something fascinating in the appearance of a cathedral church during a rainstorm, when the whole building is alive with little jets of water issuing from the jaws of dragons and wyverns, goblin birds and writhing cobolds.

The number and variety of roofs on Gothic churches of large extent, and the need of draining even much smaller surfaces than are found on the actual roofs, are supposed to furnish the reason for the many spouts that end in gargoyles, or have gargoyles associated with them as a decorative feature. As the Gothic developed, gargoyles increased with the greater care expended on decorations and the protection of the stonework.

But it is not necessary to speak of gargoyles in the past tense, for they are commonly introduced on modern churches, and occasionally are still in demand for secular buildings. It is true that modern construction for the relief of roofs from water, combined with modern drainage, no longer exacts the decorated waterspout as a working feature. They need be "practical" no longer. But for three centuries the gargoyle remained so fixed a feature of Gothic architecture that a decent feeling for consistency demands its presence in modern examples, just as the hat retains its band and the coat its lapels, though band and lapel are no longer working parts. The once useful feature has become an integral part and holds its own as a decoration.

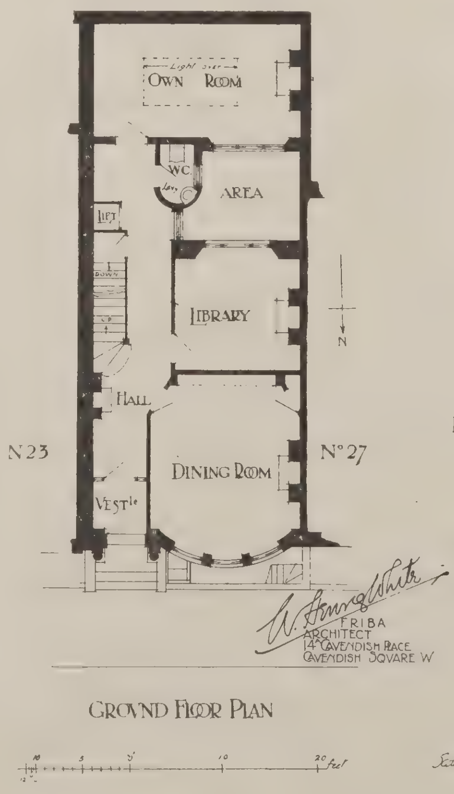
It would be difficult to say when the gargoyle first made its appearance; perhaps in opposition to the view of Viollet-le-Duc it was coincident with elaborate stone structures, and in a less striking form belonged to the Romanesque before it blossomed in the Gothic.

Nowhere more clearly than in the gargoyles of Gothic churches does one perceive that a wooden prototype has been repeated in stone. It is plain that a log bored or channelled lengthwise to form a waterspout has been finished in some eccentric shape—a chimæra, a harpy, a nondescript beast—and when required for a structure all in stone has been transferred to that material.

At the same time it is worth noting that we have no certain records of gargoyles until after the Crusades, and that fact leads us to the Orient for the fashion in gargoyles that meets us in the thirteenth century. Greek and Roman architecture are not without examples. But it is in the extreme Orient that we find exact parallels—in Ceylon, rainy Burmah and Siam.

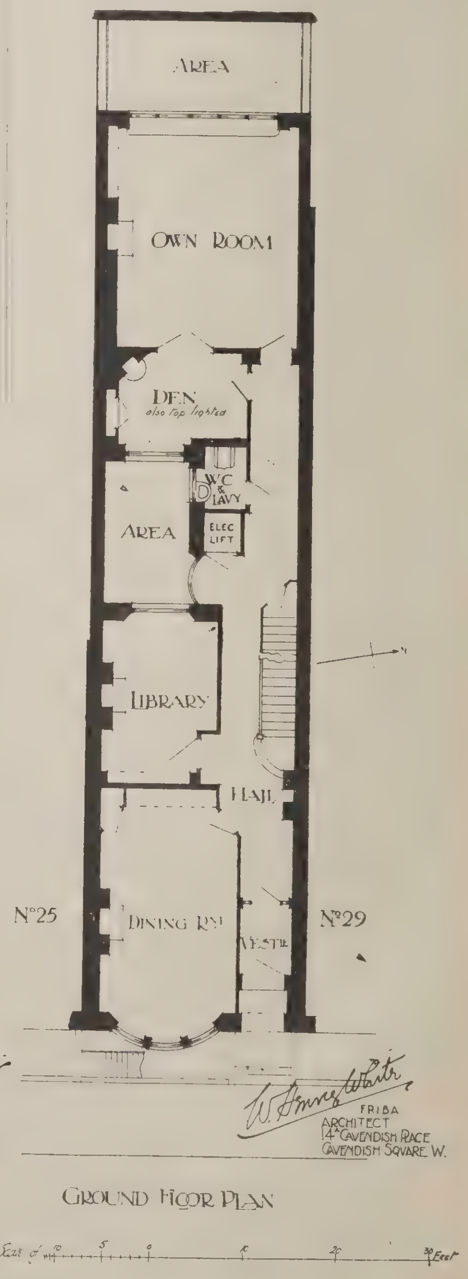
Taken by themselves, divorced from their subordinate positions, gargoyles strike us a trifle coarse with the grotesquery of their distorted masks and muzzles. But seen in connection with the figures of divine beings and saints as they stand on their pedestals under their canopies, the whole combining to make a façade such as that of Rouen or Chartres appear like an intricate field of lacework, the gargoyles form a contrast at once pleasing and in harmony with good sense; they are minor parts of a great intricate whole, and should not be thought of separate from the other sculpture.

N°25 QVEEN ANNE STREET. W:



GROVND FLOOR PLAN

N°27 HARLEY STREET. W:



GROUND FLOOR PLAN

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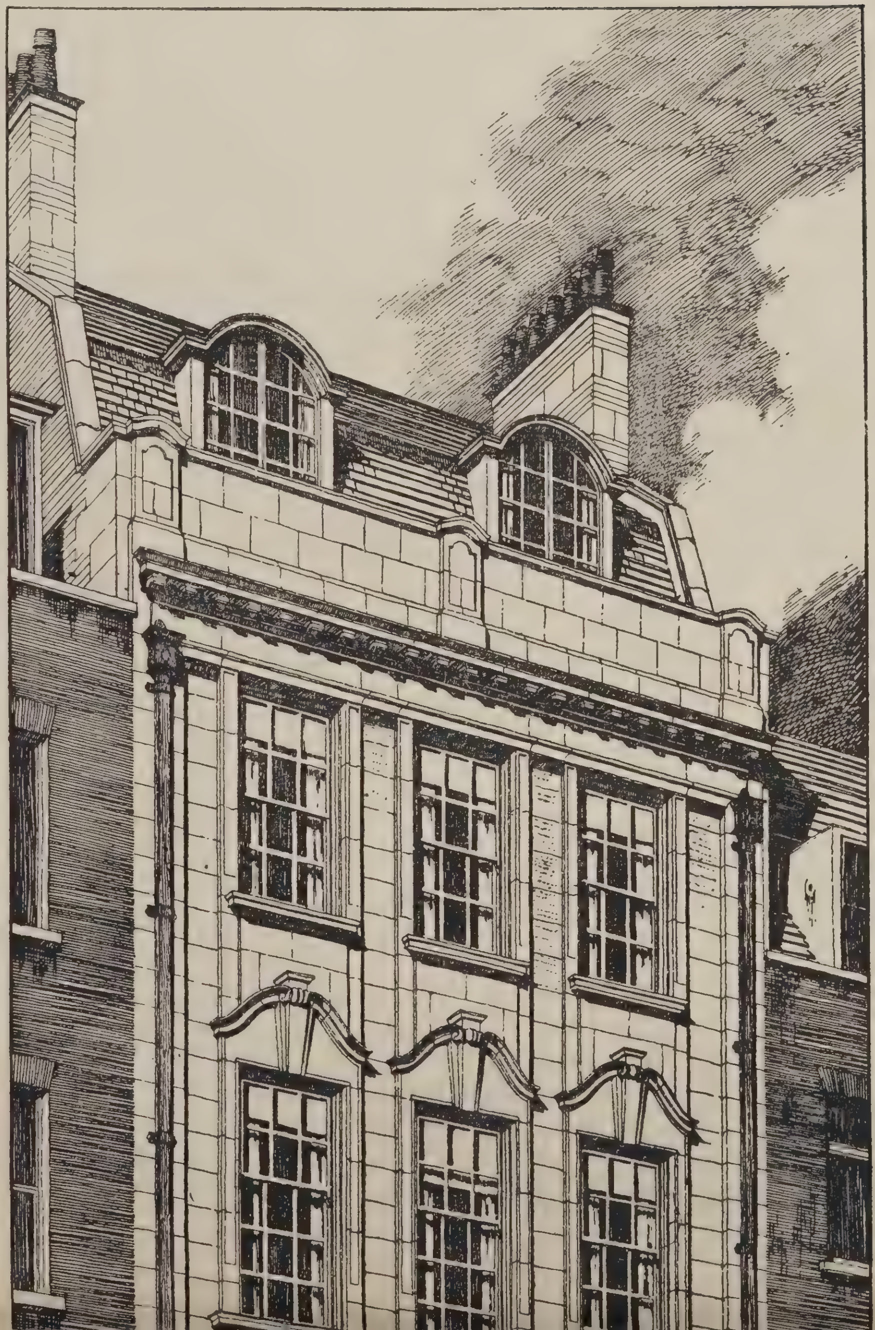
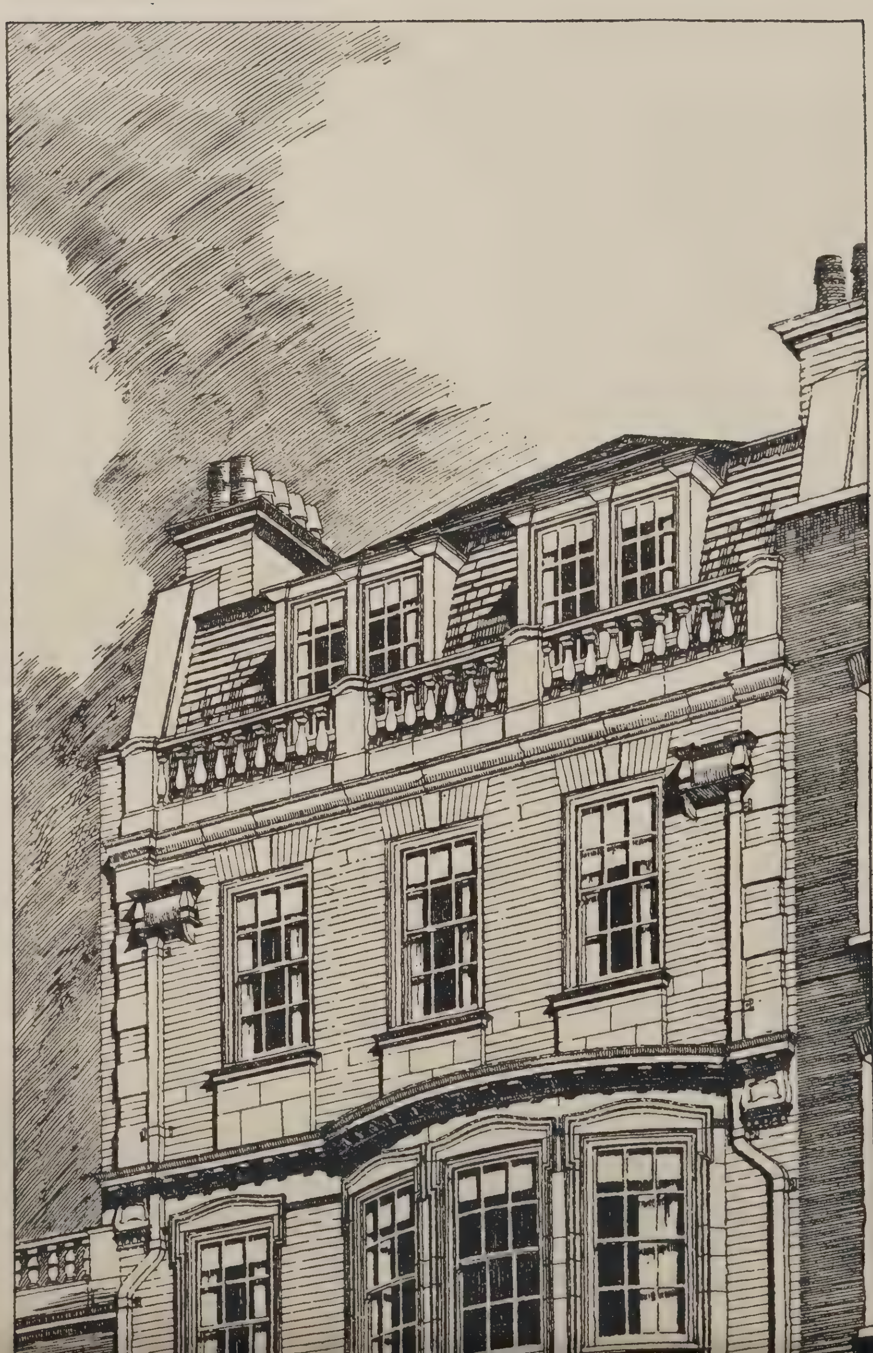
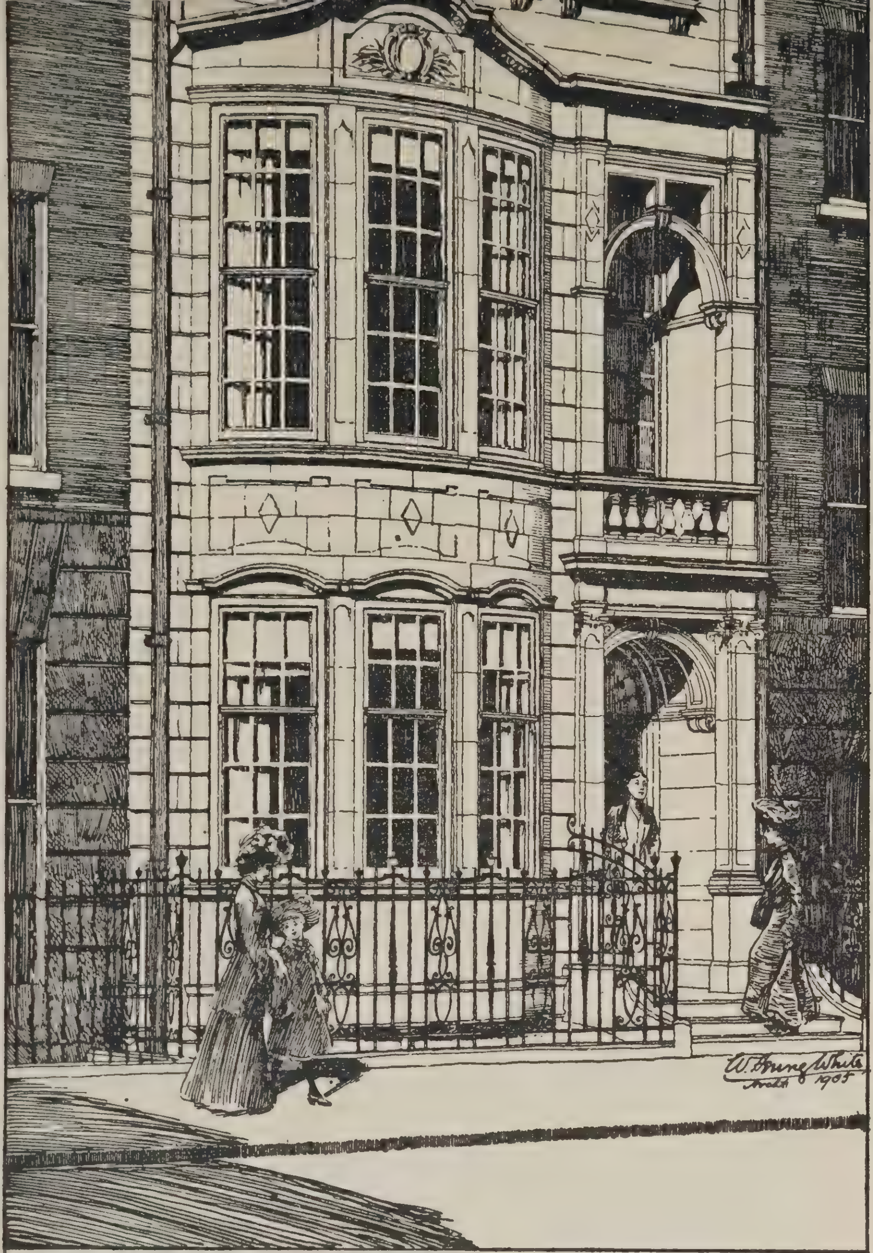
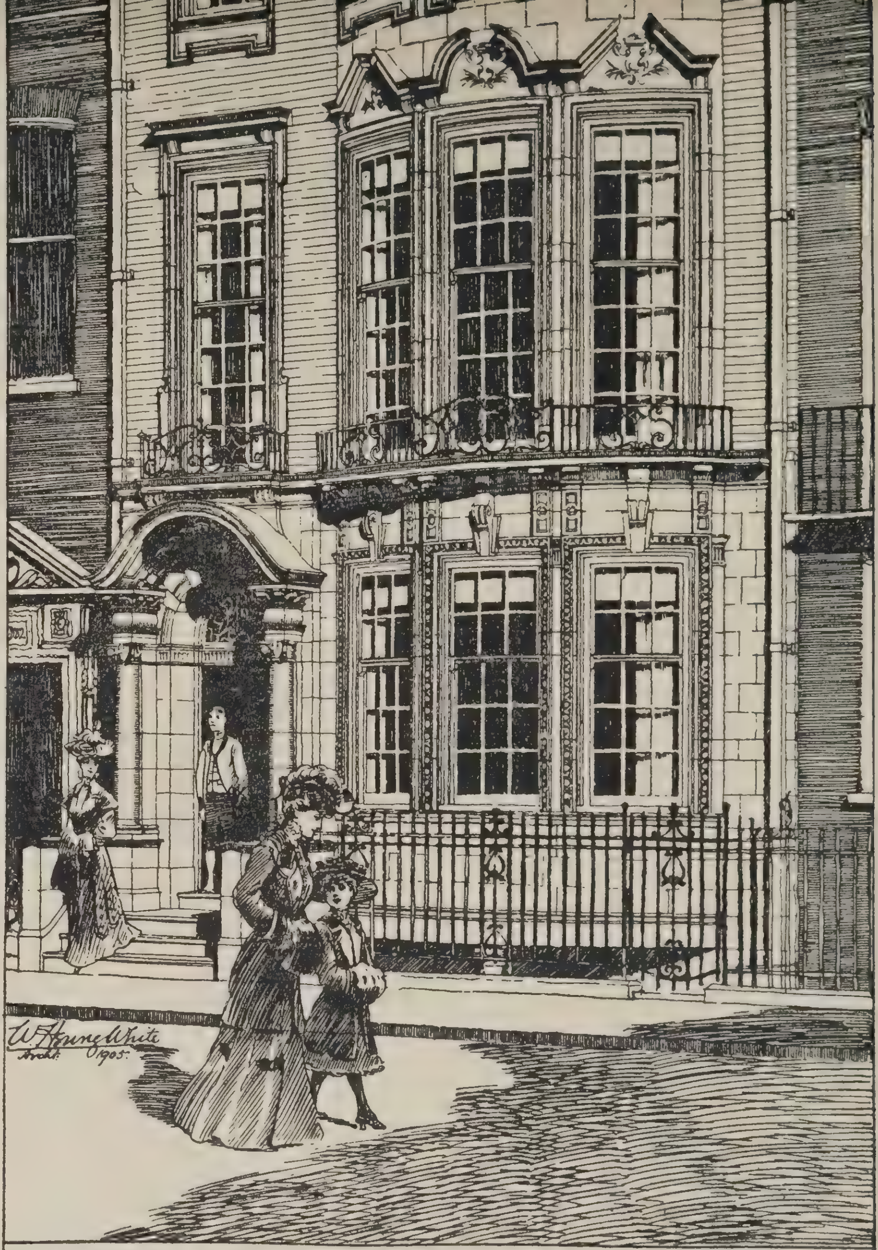
Supplement to
THE BUILDERS' JOURNAL AND ARCHITECTURAL ENGINEER,
Wednesday, July 4th, 1906.







N° 27 HARLEY STREET. W W HENRY WHITE F.R.I.B.A. ARCHITECT
14A CAVENDISH PLACE CAVENDISH SQre W


W. Henry White Archt. 1905.

N° 25 QUEEN ANNE St. W. W HENRY WHITE F.R.I.B.A. ARCHITECT
14A CAVENDISH PLACE CAVENDISH SQre W

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Enquiries Answered.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

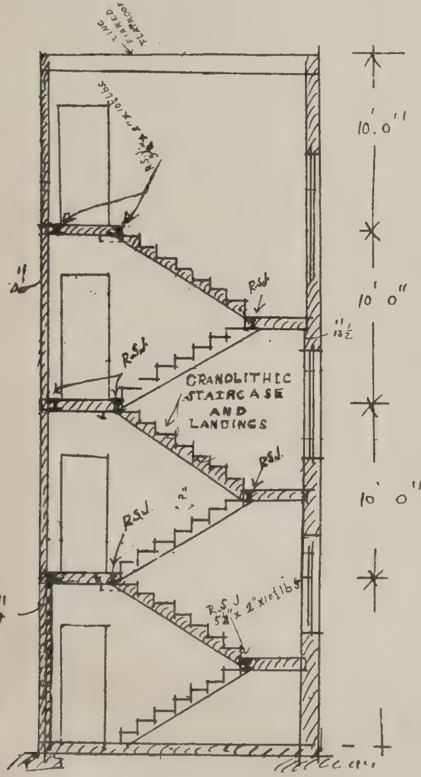
Underpinning Old High Wall on Bad Ground.

N. C. writes: "Which is the most economical and safest manner in which to underpin two brick walls of an old building? The brickwork is bad. The walls in question are about 6oft. in height, but are not carrying any floors or roof. They stand on a clay and soft sandy soil. The purpose for the underpinning is to place new concrete foundation under the walls."

This is a case in which advice can only be given after a personal examination of the walls and site. HENRY ADAMS.

Stability of Staircase Walls.

London.—Old Reader writes: "Please give a simple method for calculating the weight of a granolithic and concrete staircase constructed as shown by accompanying sketch. (2) Would the internal 4½in. walls be sufficiently strong enough for the purpose?"



A half-brick wall 1oft. high without any load on it is bad enough, but in this case it is proposed to carry half-brick walls 3oft. high to support a granolithic staircase with a rolled joist at each landing. The weight of the steps and landings may be taken at 126 lbs. per ft. cube, and the live load upon them 84 lbs. per ft. super. If a pier to take the ends of the rolled joists is bonded to and built out from the walls, either in front or behind, of such section that the total load upon it at any level does not exceed 3 tons per ft. super., the structure may then be regarded as safe. HENRY ADAMS.

Soundproofing.

Noiseless writes: "Which is the more effective method of making a soundproof wooden floor—(1) laying hair bitumen felt between the joists and floor boards; (2) laying 1½in. layer of slag wool on rough boards between joists?"

You should do both, *i.e.*, put felt (it need not be tarred) under the joists, and use slag-wool pugging between. Another, and very effective method, would be to use Cabot's deafening quilt, supplied by Messrs. Arthur L. Gibson & Co., 19-21, Tower Street, Upper St. Martin's Lane, London, W.C.

Strixton Church.

Northants.—Cymro writes: "Is the east end of Strixton Church, Northants, suitable for measuring as a testimony of study for the R.I.B.A. intermediate examination?"

The east end of Strixton Church is a very suitable subject to measure for a testimony of study for the R.I.B.A. intermediate examination. It is very simple in character; but it is an exceedingly fine example of Early English work dating from 1220 A.D. There is much fine detail to be studied in this church. H. Y. M.

Architects' Charges.

S. H. S. S. writes: "A building has been erected from my plans, specification and quantities, but during the erection certain structural modifications were made, necessitating alterations to the plans and details, and the measuring-up of the whole of the works. These alterations were ordered by the clients, and in no way is it suggested that I was responsible for them. There are numerous extras, but these were ordered and approved by my clients, who are perfectly satisfied, and the total cost (between £3,000 and £4,000) comes well within my original estimate. Can I reasonably charge (1) a lump sum for altering plans, &c.; (2) a percentage for the second bill of quantities? If so, what would be a fair charge? My own idea is 25 guineas for the former and 2 per cent. for the latter."

The Royal Institute of British Architects has sanctioned a scale of fees, and it has been generally accepted and has been in force since 1872. I advise you to procure a copy. You are only entitled to charge percentage for one bill of quantities, and that should be the "bill" for the work actually executed. You are, however, entitled to charge a fee for special work and for measuring and adjusting extras and omissions. Your charges appear to be fair ones, but 2½ per cent. is more usual than the 2 per cent. you mention. F. S. I.

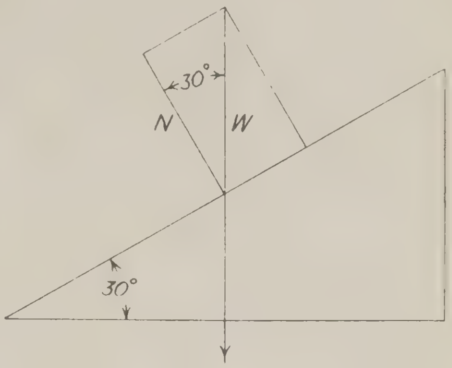
Painting and Papering Clauses in Lease.

Portsmouth. — Mecca writes: "(1) In some hotel premises most of the woodwork has been grained and varnished (much of it quite recently) and is in a generally good condition. Under terms of expiring lease lessor can require painting two coats in last year of period. Can he also require regraining and varnishing? (2) Papering is not specifically mentioned, but some of it is bad, including some papers now varnished. In repapering, must new papers be varnished where present ones are?"

(1) I am of opinion that if graining is not specifically mentioned in the lease, it cannot be insisted upon (on quitting) under an ordinary painting clause. If the lessee is liable for repainting it is customary either to paint the grained work (if much defaced) as the other work, or to touch up and re-varnish it if in good enough condition. (2) Papering has to a large extent been regarded as merely "decorative" work, and a lessee's liability under this head is not a heavy one. If there is no special mention of repapering it is somewhat doubtful whether such work can be required at all. It was laid down in the case of *Proudfoot* v. *Hart* in 1890 (L.R. 25 Q.B.D., 42) that "if repapering is necessary, tenant need not put on a paper of equal value to the old; his paper need not be of a richer character than would satisfy a reasonable man within the definition." I am of opinion, therefore, that the "varnishing" cannot be insisted upon. F. S. I.

A Problem in Mechanics.

London.—Subscriber writes: "A body of mass 10 lbs. is placed on a rough plane whose coefficient of friction is $\frac{1}{\sqrt{3}}$ and whose inclination to the horizon is 30 degs. If the length of the plane be 4ft. and the body be acted on by a force parallel to the plane, equal to 15 lbs. weight, find the time that elapses before it reaches the top of the plane."



There appears to be a little doubt as to the terms of the question. A mass of 10 lbs. is resting on the plane, and a force of 15 lbs. weight is drawing it up the plane. Assuming that mass and weight are used synonymously, I should work as follows: $-N = W \cos 30$, $\mu = \frac{1}{\sqrt{3}}$. Retarding force $= W \cos 30 \times \frac{1}{\sqrt{3}} = 10 \times \frac{\sqrt{3}}{2} \times \frac{1}{\sqrt{3}} = 5$ lbs. Force free to act $= 15 - 5 = 10$ lbs. $a = \frac{f}{M} = \frac{10}{10} = 1$ft. per sec. $s = \frac{at^2}{2}$. Therefore $t = \sqrt{\frac{2s}{a}} = \sqrt{\frac{2 \times 4}{1}} = \sqrt{8} = 2{\cdot}828$ secs.

HENRY ADAMS.

Lead Waste for Lavatories.

New Wandsworth.—H. F. writes: "Would you recommend lead waste pipe for lavatories and sink where hot water is used on six floors? If so, what size and weight of pipe, and how fixed? What weight for 2in. (internal diameter) lead waste pipe per foot run? Sketch sent (not reproduced)."

The vertical main down-pipe on the wall had better be of cast-iron, as the great weight of lead for the 70ft. or so of height will be difficult to hold up, and the downward drag tends to open the joints. If lead be used the thickest and strongest should be at the top, and it should be lessened at every floor and a half, or at most every two floors, as it goes down. The weights may be 20, 15 and 10 lbs., or the nearest obtainable in your district, for the top, middle and bottom lengths; the tacks or clasps to the wall may be at 3ft., 4ft. and 5ft. centres respectively. Bends of a good size in the pipe from basin to main will take all the expansion due to hot water. O. W.

American Partition Slabs.

Clapham Common.—A. H. A. writes: "Kindly give me some information respecting various American fire-resisting partition slabs (fireclay or terra-cotta), with the names and addresses of the British agents for same."

We can only recollect one American block partition that has been put on the English market. That is a terra-cotta one supplied by the National Fireproofing Co., whose address is 27, Chancery Lane, London, W.C.

Measurement in Canada and the States.

COATBRIDGE.—C. L. writes: "Is there any particular 'mode' of measurement in Canada or U.S.A.—whether for a slump sum or measurement after erection, or whether the tradesmen measure the work themselves?"

The contractors almost invariably take out their own quantities.

Paint for Roof.

MARKET RASEN.—R. F. G. writes: "Which is the best paint or other material to use for the preservation of a corrugated iron church roof which has not been painted previously?"

There are several rustproof paints on the market which we could recommend. One of the best is Messrs. Wailes, Dove & Co.'s "Bitumastic" enamel and solution.

Books on Physics and Mechanics.

WIGAN. — A STUDENT writes: "What books on physics and mechanics are most suitable for the R.I.B.A. preliminary examination?"

"Lessons in Elementary Physics," by Balfour Stewart, and "Elements of Mechanics," by Mansfield Merriman (price 4s. 6d. each post free from our offices).

Building Trade in Canada.

COATBRIDGE.—A. G. writes: "I am an architectural draughtsman. Can you advise any particular town in which building trade is good in Canada?"

There is plenty doing all over Canada. You would find it useful to apply to the Canadian Emigration Office in Whitehall for information. We should not advise the older towns in the east, but would suggest striking out west, say, to Regina, the capital of Saskatchewan, or Edmonton, the capital of Alberta.

Position in County Architect's Office.

DARLINGTON.—H. B. writes: "I am desirous of obtaining a junior position in one of the county council architectural offices, in Yorkshire or Durham if possible, preferably for school work, of which, however, I have no practical experience. I am twenty-three years of age, and have been mostly engaged on domestic and alteration work to country hotel and inns. (1) Do you advise me to try for such a post? (2) How is admission gained? (3) To whom should I apply in the counties of Yorkshire or Durham?"

(1) Yes, by all means. (2) By applying in answer to advertisements, writing or calling to show examples of your work in view of possible openings. (3) The surveyor to the East Riding County Council, Beverley; the surveyor to the North Riding County Council, Northallerton; the County Architect to the West Riding County Council, Wakefield; the surveyor to the Durham County Council, Durham.

Knotting in Paintwork.

PIETERMARITZBURG. — NATAL writes: "Why is it that knotting (or is it the resin from the knots?) works through paintwork a few months after completion? This has happened in many instances in local work, and painters attribute it to the climate and say it cannot be prevented. In some instances it has happened where the knotting appears to have been properly executed. Would it be the fault of the knotting or the method of application?"

The trouble is due to the hot climate, which overcomes the resistance of the shellac varnish to keep in the resin. Large knots or those running with resin should be cut out and replaced by sound wood, but with small knots resort may be had to tinfoil, which should be stuck over the knots with shellac varnish before painting.

Park Pavilions.

ASSISTANT writes: "What are the general requirements for a pavilion or shelter, with caretaker's house, in a small public park? Have designs for the above appeared in any of your back numbers?"

We have only published photographs, without plans, of park pavilions. It is not always advisable to combine the park keeper's house with the pavilion. If the site necessitates it, the house should be at the back of the shelter, so that the residents may not be overlooked. The lodge if separate will prevent this, and yet enable the park keeper to survey the park to some extent, and so see if his services are needed. The pavilion may be simply a shelter, or may have refreshment-rooms, waiting-rooms and conveniences. It all depends upon local circumstances.

Rough-cast.

PLYMOUTH.—ROUGH-CAST writes: "What are the best materials and proportions for rough-cast on hollow brick walls to finish white?"

Walls constructed with a single thickness of hollow brick blocks would be better coated with Portland cement rough-cast than with the usual lime rough-cast, although the latter offers considerable resistance to damp if well done. We suggest a rough-cast made of 2 Portland cement, 1 gravel, 2 of white limestone dust and $\frac{1}{10}$th powdered whiting or ground chalk. There is no necessity to apply in two coats (as is advisable with lime rough-cast) if only the hollow-blocks are keyed or grooved on the surface, or brick-joints are raked out, and the surface is clean and thoroughly wetted.

Efflorescence on Brickwork.

LEE.—SUBSCRIBER writes: "What is the cause of the white substance appearing on the face of red brickwork?"

This is known as efflorescence, and is variable in composition. It may be due to salt, gypsum or magnesia, singly or together. These are all soluble and crystallize on the face. In time, of course, the efflorescence will disappear.

Buildings to Study near Darlington.

DARLINGTON.—A STRANGER writes: "I am staying in Darlington for a short holiday and would like to measure some buildings of architectural interest in or within a short walk of the town. Please mention some."

After Durham Cathedral, St. Cuthbert's Church, Darlington, is one of the finest and most spacious ecclesiastical buildings in England and is of special interest to architects as exhibiting very clearly the transition from the Norman to the Early English style. The tower was built above the roof ridge and the spire added in 1350-1375; the weight caused the piers below to give way, which led to the walling up of the two windows in the south transept and to the erection of a massive rood-loft to give strength to the piers. The lepers' window, the bold and massive carved choir stalls and the "Easter Sculpture" should be specially noticed. The church of Haughton-le-Skerne contains some Norman work. The balustraded seventeenth-century piers, the tower and fragments of wonderful Saxon crosses at Aycliffe Church are worth noting. The quadruple shafts and foliated caps (restored) of the nave arcading of Sedgefield Church, which place is about 10 miles by rail from Darlington, are worth studying. This church also contains some good Decorated and Elizabethan work. Heighington Church has some Norman windows in its towers and a fine Norman arch to the chancel decorated with a billet label. There is also a fine pre-Reformation pulpit here. High Coniscliffe Church is chiefly of the Early English period with a good spire and some beautiful carved choir stalls. Gainsford contains a church dating from about 1200 A.D. Croft Church is chiefly Decorated in style, with some good sculpture in the chancel. Portions of the church are of Norman date. The fine Decorated sedilia and piscina are well worth measuring or sketching. H. Y. M.

Architectural Tours.

NORTHERN writes: "I should be glad if you could suggest subjects of study for a ten days' architectural tour in the vicinity of (1) Norwich and (2) Gloucester, it being intended to use one of these places as a centre of operations."

Norwich cathedral contains work of the Norman and all the Gothic periods. Norwich Castle is a very fine example of Norman fortified work. The council chamber of the Guildhall contains the fittings of a "Court of Justice," which remain almost exactly as in the days of Henry VIII., having carved panels, stained glass and an open timber roof. St. Andrew's Hall, formerly the nave of a Dominican convent church, is a fine example of late Perpendicular work. The three portals, known as the Erpingham Gate, St. Cuthbert's Gate and the Bishop's Gate, are well worth studying. The Bishop's Palace contains work of the Norman, Early English and Decorated periods. The grammar school is worth a visit. Norwich contains more churches than any other cathedral city in England, there being thirty-five in all, which are for the most part Perpendicular in style, ranging in date from 1350 to 1500; many of them possess lofty towers. The most interesting of these churches are St. Peter's Mancroft and St. Andrew's, but most of the others are worth studying. Carrow, a suburb of Norwich, contains the remains of a fine Benedictine Priory. Magnificent coloured and carved wood screens are to be found at Ranworth and Fritton churches. Fine churches are also to be found at Acle, Winterton, East Dereham, Ludham, Yarmouth, Oulton, Lowestoft, Beccles and Wickhampton. Haddiscoe Church possesses one of the finest round towers in the country. At Gloucester there are the cathedral, the deanery, the palace, and three fine churches. The cathedral contains work of the Norman and the three Gothic styles. The Norman chapel of the deanery is well worth studying. The palace is chiefly of the fifteenth century, and contains a fine Decorated room known as the Abbot's Hall. The church of St. Mary de Crypt is chiefly of Perpendicular date with Early English and Decorated portions. The only remains of St. Mary de Lode are the tower, the chancel, and a curious wooden pulpit. The church of St. Nicholas contains work of the Norman, Early English and Perpendicular periods. The priory of St. Oswald is interesting, being of an Early French character with an apsidal chapel. Round about the church of St. Mary are remains of the Grey and Black friars. Under the Fleece Inn is a crypt of the twelfth century. A Perpendicular vault is to be found under the Saracen's Head Inn. New Inn in Northgate Street contains some fine chestnut timber work of the thirteenth century with some curious antique carving. At Deerhurst is a good example of a Saxon church. Bridgeworth Church is a fine example of work of the Decorated period. Norman and Perpendicular work are to be found at Barnwood Church. A church built in the reign of Edward III., containing an example of a Norman font, is to be seen at Leckhampton. A graceful Decorated spire is to be found at Standish Church. Hempstead Court, which is of fifteenth-century date, contains some fine art treasures. Hempstead Church possesses a Perpendicular tower of rather peculiar construction and a good Decorated chancel. Matson House is an example of Elizabethan architecture. Brimpsfield Church is worth a visit. If the Gloucester district is chosen for your tour, a visit should be arranged to Tewkesbury Abbey. H. Y. M.

MILAN EXHIBITION.

ON this page we give a photograph of the "Pavilion of the Simplon," which forms the chief entrance to the exhibition now open at Milan. This is, of course, quite of the exuberant exhibition class of architecture, but in these buildings there are none of the sobering influences which control buildings for serious life. The general effect of this entrance block is rather happy, though some of the detail is far from pleasing—as, for example, on the capitals of the piers; but here and there about the façade there are a great many *motifs* treated in a fresh manner. Sculpture has been brought into play considerably, the Rodinesque feeling predominating, but the figure of wingèd Mercury seems too classic for juxtaposition with the works of the latest Italian school. The majority of the other buildings of the exhibition, judging by the photographs we have seen, are purely rampant.

MANCHESTER NOTES.

(*By our own Correspondent.*)

THE Platt Hall Estate at Rusholme, Manchester, the finest open space so near the city, has been offered for sale and withdrawn at £46,300. The history of the estate dates back eight centuries. The present hall was built 142 years ago. The total area is seventy-seven acres, with a considerable frontage to Wilmslow Road, one of the finest roads out of Manchester. Mr. C. W. Previs, the auctioneer, stated that the sale was the most important since the Trafford Park estate was offered.

Mr. John Ely, F.R.I.B.A., of Manchester, has prepared plans for the new Hospital for Women and Children to be erected at the corner of Oxford Street and High Steeet, Manchester. The hospital is to accommodate 84 women and 27 children.

Mr. Hamo Thorneycroft, R.A., has reported to the committee of the Manchester War Memorial that the group, which is already in plaster, will be completed in six months. Mr. Thorneycroft's description of the memorial is as follows: "It consists of a group of two soldiers as in the midst of a hand-to-hand fight; one of them down on the ground wounded, resting on one hand, while with the other he hands his last cartridge to his brave and stalwart companion, who stands above with firmly planted feet and tightly gripped rifle in the action of defence. The figures are larger than life—what is known as 'heroic' size, about 6ft. 8ins.—and are placed on a rocky plinth about 2ft. 6ins. deep; so the whole group is about 9ft. in height. This will be placed on a granite pedestal, which will be enriched with panels inscribed with the names of the men of the Manchester Regiments who fell in the late war."

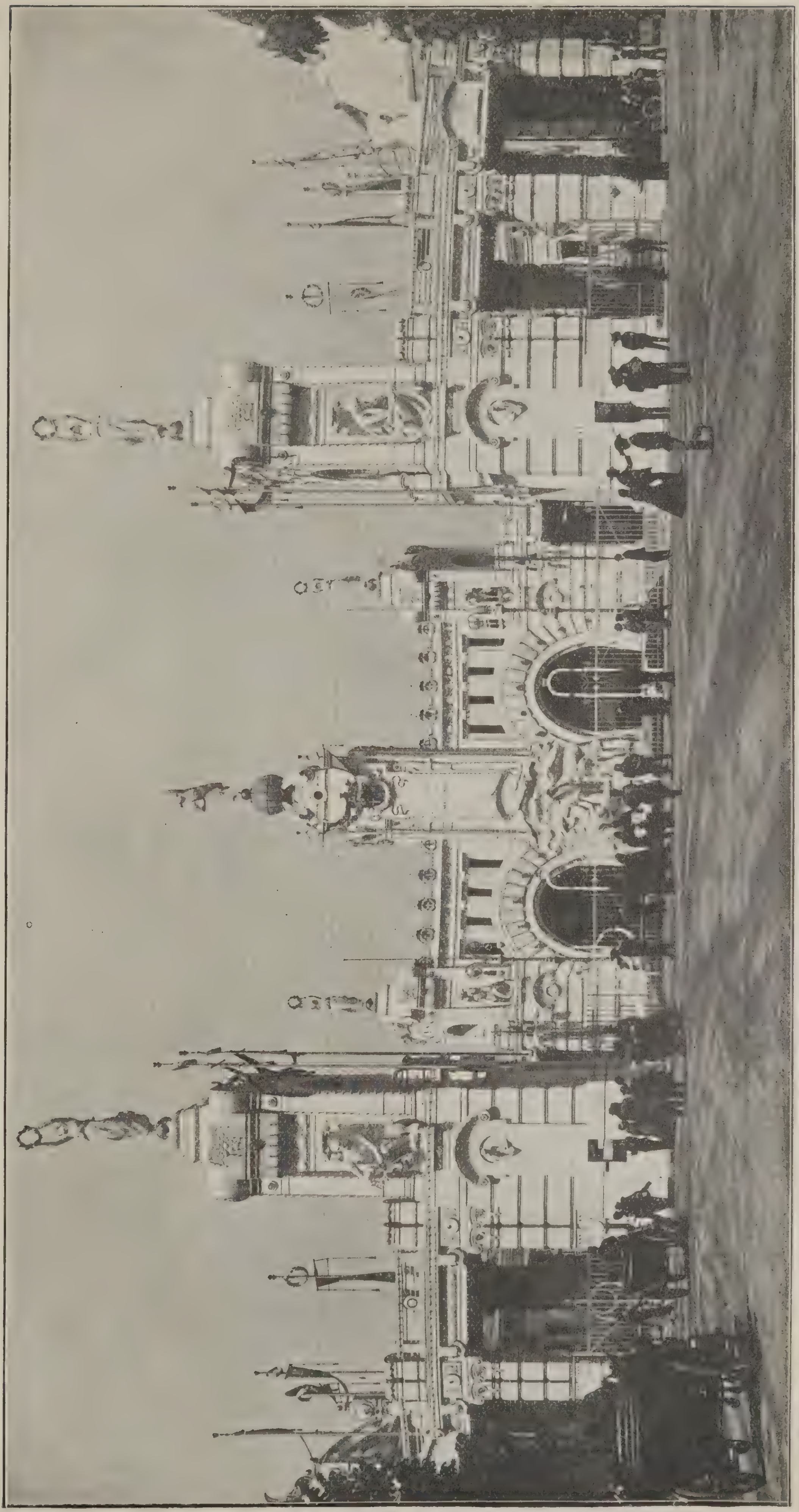


Photo: Romieux.

MILAN EXHIBITION: THE PAVILION OF THE SIMPLON.

Complete List of Contracts Open.

WITH a few exceptions, news of Contracts Open are not repeated after they have been published once in these columns, so that readers will find particulars in our previous issues of other contracts that still remain open.

Unless expressly stated to the contrary all deposits required for bills of quantities, &c., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair-wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

July 5. Beverley.—*Additions and alterations* to the Council School at Hemingbrough. Persons desirous of tendering for the work may see the drawings, specification and obtain forms of tender on application to the Building Surveyor, County Hall, Beverley, or at the above school during the usual hours. Tenders, endorsed "Hemingbrough School," to John Bickersteth, clerk to the East Riding Education Authority, County Hall, Beverley, not later than July 5.

July 5. Devonport.—*Erection of a new administrative building* at the Infectious Diseases Hospital, near North Prospect. Plans specifications, and conditions may be seen and forms of tender and quantities obtained on application to the Borough Surveyor, 29, Ker Street, Devonport, to whom tenders must be delivered, properly endorsed, on or before 10 a.m. on July 5. The sum of £1 1s. will be required as a deposit. Fair wages clause.

July 5. Bingley.—*Erection of a washhouse* at Bingley. Plans can be seen and quantities obtained at the offices of Samual Jackson & Son, Tanfield Chambers, Bradfield, from June 30 to July 5.

July 5. Dewsbury.—*Erecting about 217 yds. of brick walling* at the workhouse at Staincliffe. Specification and particulars to be obtained from the master of the Workhouse. Tenders to be delivered to Joseph Peace, clerk to the Guardians, Union Offices, Wellington Street Dewsbury, not later than July 5.

July 5. Belfast.—*Erection of workmen's cottages* on the Mill Town Road, Purdysburn. Plans and specifications can be seen at the offices of Young & Mackenzie, architects, Scottish Provident Buildings. Sealed tenders, endorsed "Tender for Cottages," to be lodged in the Town Clerk's Office, before 11 a.m. on July 5.

July 5. Cardiff.—*Erection of shops and premises* according to the plans of E. H. Bruton, F.R.I.B.A., Cardiff, for G. A. Spencer, The Square, Senghenydd, where plans and specification may be seen on June 27, and to whom tenders are to be sent not later than July 5.

July 5. London.—*Erection of* seven coal offices at Finchley Road, London, for the Midland Railway Co. Plans and specifications may be seen, quantities and particulars obtained on application at the Engineer's Office Derby Station. Sealed tenders to be forwarded by post to the Secretary of the Way and Works Committee, Midland Railway, Derby, not later than 9 a.m. on July 5.

July 5. Gosport. — *Erection of a new school* in Clarence Square, Gosport, to accommodate 330 boys. Plans and specifications may be seen at the offices of the architect, H. Frost, surveyor to the District Council, Gosport, and quantities and forms of tender obtained on payment of a deposit of £5. Sealed tenders, endorsed "Clarence Square School," should be delivered to George R. Walker, secty., Education Offices, High Street, Gosport, not later than noon on July 5.

July 5. St. Keverne.—*Erection and completion of proposed residence* at St. Keverne, for Dr. E. Leverton-Spry, according to plans and specification, which may be seen by appointment at the proprietor's residence or at the office of Sampson Hill, architect, Green Lane, Redruth, from whom all particulars relating to the work may be obtained. Sealed endorsed tenders are to be sent to the proprietor, St. Kevern, R.S.O., on or before July 5.

July 5. Devonport.—*Erection of* a new administrative building at the Infectious Diseases Hospital, near North Prospect. Plans, specifications and conditions may be seen and forms of tender and quantities obtained on application to the Borough Surveyor, 29, Ker Street, Devonport, to whom tenders must be delivered, properly endorsed, on or before 10 a.m. on July 5. The sum of £1 1s. will be required as a deposit, which amount will be returned on receipt of a *bona-fide* tender.

July 6. Dublin.—*Erection of* vestry and heating arrangements to mortuary chapel in Deans Grange Cemetery. Plans and specifications can be seen at the Cemetery (Registrar's Office) during office hours, 8.30 till 4 o'clock. Tenders to be delivered at Deans Grange Cemetery on or before July 6.

July 6. Newton Abbot.—*Erection of a six-stall stable* at Newton Abbot, for the Great Western Railway Co. Plans and specification may be seen and forms of tender and bills of quantities obtained at the office of the Engineer at Plymouth Station, between 10 and 4. Tenders, addressed to G. K. Mills, secty., Paddington Station, London, and marked outside, "Tender for Stable, Newton Abbot," will be received on or before July 3.

July 7. Stafford.—*Alterations and improvements to Stretton Council School*, near Burton. Builders desiring to tender for the work should apply to Graham Balfour, Director of Education. Quantities will be supplied, for which a deposit of £1 1s. will be charged. The drawings and specification can be seen at the offices of the Education Committee at Stafford.

July 7. Eccles.—*Erection of the Carnegie Public Library* in Church Street. A copy of the bill of quantities, general conditions and form of tender may be obtained at the Town Clerk's Offices on depositing the sum of £2 2s. The plans may be inspected and further particulars obtained at the office of the architects, Potts, Son & Hennings, 34, Victoria Buildings, Victoria Street, Manchester. Tenders, endorsed "Tender for Carnegie Library," to be delivered to Edwin Parkes, town clerk, Town Hall, Eccles, not later than noon on July 7.

July 7. Truro.—*Alterations and additions* to the Bella Vista College, Truro, according to plans and specifications which may be seen at the County Education Office, Truro, or by appointment at the office of Sampson Hill, architect to the Committee, Green Lane, Redruth, from whom all particulars relating to the work may be obtained. Sealed endorsed tenders, on official forms, which may be had from the Secretary or the Architect, are to be sent to F. R. Pascoe, secty., Education Office, Truro, on or before July 7. The alterations to the building are to be completed before September 29 next.

July 7. Eastwood.—*Erection of a new school* at Eastwood, near Southend-on-Sea, to accommodate 160 children, and also for certain alterations and additions to the existing school. Contractors desirous of tendering are required to communicate with S. I. Adams, M R.S.I., architect and surveyor, Weston Chambers, Weston Road, Southend-on-Sea, not later than noon on June 21, enclosing cheque for £2 2s. Plans and specification may be seen at the offices of the Architect between 10 a.m. and 4 p.m. (Saturdays 10 a.m. to 12 noon) after June 30. Tender, sealed and endorsed "Tender for Eastwood School," are to be sent to J. F. Ingram, secty., Bank Chambers, Weston Road, Southend-on-Sea, by 10 a.m. on July 7.

July 7. Cwmduad. — *Renovation* of Cwmduad Baptist Chapel, in the parish of Conwil. Plans and specifications may be seen at Cilarddu, Conwil. Tenders, sealed and endorsed, to be sent to the Secretary, Baptist Chapel, Cwmduad, on or before July 7.

July 7. Swansea. — *Conversion* of Old Bethany Chapel, Edward Street, Swansea, into a warehouse. Plans and specifications may be seen and quantities obtained at the offices of the architect, Charles T. Ruthen, Bank Chambers, Heathfield Street, Swansea, upon payment of £1 1s. Tenders to be sent, addressed to Spillers & Bakers, Ltd., millers, Cardiff (Engineering Department), endorsed "Tender for Warehouse, Swansea," on or before July 7.

July 7. Old Trafford.—*Work and materials* required in the erection of a caretaker's house at the Council Offices, Old Trafford, for the Stratford U.D.C. The work is an instalment of a larger scheme of office extension ; and the drawings may be seen and specification, with schedule of quantities and form of tender, obtained on application to Ernest Worrall, the Council's surveyor, any day during office hours on payment of a deposit by cheque of £2 2s. Sealed tenders, on the form supplied, endorsed "Caretakers' House," and addressed to the Chairman, are due at the Council Offices by July 7.

July 7. Killay. -*New schoolroom* in connection with Siloam Baptist Chapel. Plans and specifications can be seen and all particulars obtained of Charles S. Thomas, architect and surveyor, Wind Street, Swansea. Sealed and endorsed tenders to be sent to Evan Williams, Goitre Fawr, Killay, on or before July 7.

July 7. Llanfihangel-y-Creuddin.—*Alterations, repairs and erection of boundary walling, gates, &c.*, at the school. Plan and specification, or copies of the same, can be seen at the school building in charge of the headmaster or at the office of G. Dickens-Lewis, M.S.A., county architect, 12, Terrace Road, Aberystwyth. Tenders, sealed and endorsed "Llanfihangel y-Creuddin School Estimate," are to be delivered not later than midday on July 7 at the office of R. J. Roberts, District Education Committee, Cambrian Chambers, Aberystwyth.

July 7. Cofadail.—*Alterations, additions and repairs* to the school and master's house adjoining. Plans and specification, or copies of the same, can be seen at the school building in charge of the headmaster, or at the office of G. Dickens-Lewis, M.S.A., county architect, 12, Terrace Road, Aberystwyth. Tenders, sealed and endorsed "Cofadail School Estimate," are to be delivered not later than midday on July 7 at the office of R. J. Roberts, clerk to the District Education Committee, Cambrian Chambers, Aberystwyth.

July 7. Brynherbert.—*Alterations and repairs* to the school building. Plans and specification or copies of the same can be seen at the school building in charge of the headmistress, or at the office of G. Dickens-Lewis, M.S.A., county architect, 12, Terrace Road, Aberystwyth. Tenders, sealed and endorsed "Brynherbert School Estimate," are to be delivered not later than midday on July 7 at the office of R. J. Roberts, clerk to the District Education Committee, Cambrian Chambers, Aberystwyth.

July 7. Cardigan.—*Alterations* to the offices and drains and the fixing of automatic flushing latrines at the school. Plan and specification, or copies of the same, can be seen at the school building in charge of the headmaster, or at the office of G. Dickens-Lewis, M.S.A., county architect, 12, Terrace Road, Aberystwyth. Tenders, sealed and endorsed "Cardigan School Estimate," are to be delivered not later than midday on July 7 at the office of Ivor Evans clerk to the District Education Committee, Cardigan.

July 7. Donacloney.—*Erection of* new manse. Plans and specifications may be seen at the office of W. W. Larmor, architect, Banbridge, or Howard Lyttle, Ballymenally, Donacloney. Tenders to be sent to Howard Lyttle, Donacloney, on or before July 7.

July 7. Bangour.—*Construction of* a timber meat larder at Bangour Village Asylum. Schedules may be obtained on application to the architect, Hippolyte J. Blanc, R.S.A., 25, Rutland Square, Edinburgh, where the drawings, specification and general conditions of contract will be exhibited. Schedules to be priced and extended and lodged with James Kyd, clerk and treasurer, Edinburgh District Lunacy Board, Castle Terrace, Edinburgh, not later than July 7.

July 9. Edinburgh.—*Brick, joiner, plumber and slater work* for the erection of new firewood factory buildings, Craigleith Poorhouse, Comely Bank, Edinburgh, for the Parish Council. The plans can be seen and schedules of quantities obtained on application to R. M. Cameron, architect to the Council, 53, Great King Street, Edinburgh. Sealed tenders are requested to be addressed, delivered and endorsed, to the Clerk, Parish Council Offices, Castle Terrace, not later than 10 a.m. on July 9.

July 9. Newark.—*Alterations and additions* at the Union Infirmary, Bowbridge Road, Newark, for the Guardians. Persons desirous of tendering for the alterations and additions thereto are requested to forward their names and addresses and a cheque for £2 2s. as a deposit to A. J. Franks, clerk to the board, Union Offices, Newark, on receipt of which form of tender and bills of quantities will be forwarded. Plans and specifications may be inspected at the office of the architect, Arthur Marshall, A.R.I.B.A., King Street, Nottingham. The deposit will be returned upon receipt of a bona fide tender upon the form to be supplied. Sealed tenders endorsed "Alterations at Infirmary," must be sent in to the Clerk not later than July 9.

July 9. Birmingham.—*Reconstruction of a portion of the tramway depot* in Kyott's Lake Road. Applications for forms of tender and bills of quantities may be made on or before June 28, at the office of the quantity surveyor, Anthony Rowse, King's Court, Colmore Row, Birmingham. Before obtaining the bills of quantities, it will be necessary to deposit a sum of £3 3s. for which a receipt will be given. The drawings may be seen on and after the same date at the office of the architect, Frank Barlow Osborn, F.R.I.B.A., 13, Bennett's Hill, Birmingham. Fair wages clause. Tenders must be delivered not later than noon on July 9 in sealed envelopes, addressed to the Chairman of the Tramways Committee, Council House, Birmingham, endorsed "Tender for Tramway Depot."

July 9. Limerick.—*Erection of twelve farmhouses* at Mount Shannon, near Limerick for the Irish Estate Commissioners. Plans and specifications can be obtained from the secty., Estates Commissioners, on receipt of £1. Tenders should be enclosed in a sealed envelope, marked "Tender" in left hand corner, and addressed to The Secty., Estates Commissioners, 26, Upper Merrion Street, Dublin. The latest date for the receipt of tenders will be noon on July 9.

July 9. Hastings.—*Alterations and additions to the existing grammar school buildings* and for the erection of a workshop. Plans and specification may be seen and quantities obtained at the offices of the architects, A. W. Jeffery & Son, 5, Havelock Road, Hastings, on payment of a fee of £1 1s. Sealed tenders, endorsed "Grammar School Tender," to be addressed to "The Clerk, Education Committee," 18, Wellington Square, Hastings, not later than noon on July 9.

July 9. Southampton.—*Works* of external and internal repairs, gravelling, lavatory accommodation, rebuilding, lighting, ventilation and new offices to Grately School. Tenderers may see plans and conditions of contract, and obtain specification at the office of W. J. Taylor, county surveyor, The Castle, Winchester. Plans and conditions of contract may also be seen at the school. A deposit of £1 1s. will be required for a copy of the specication. Deposits must be made by cheque payable to Hants County Council, and crossed Bank of England, or particulars will not be sent. Tenders, endorsed "Proposed work, Grately Council Schools." are to be delivered to H. Barber, clerk to the County Council, The Castle, Winchester, on or before July 9.

July 9. Penarth.—*Private street improvement works* in Harbour View Road and Lane, Salisbury Avenue Lane, and Clinton Lane, for the U.D.C. Plans and specification may be seen and bills of quantities obtained from Edgar J. Evans, A.M.I.C.E., surveyor, Council Offices, Penarth. Sealed tenders, endorsed "Tender for Street Works," must be delivered not later than noon on July 9.

July 9. Kiffig.—*Repairing the tower and interior* of Kiffig Church, near Whitland. Plans and specification to be seen with D. Raymond, Waun Farm, Kiffig, Whitland. Endorsed tenders to be sent in not later than July 9.

July 10. Pontgarreg.—*Alterations and repairs* to the school. Plan and specification or copies of the same can be seen at the school building in charge of the headmaster, or at the office of G. Dickens-Lewis, M.S.A., county architect, 12, Terrace Road, Aberystwyth. Tenders, sealed and endorsed "Pontgarreg School Estimate," are to be delivered not later than midday on July 10 at the office of T. Thomas, clerk to the District Education Committee, Llandyssul.

July 10. Pontshan.—*Repairs and the erection of a new classroom and cloakrooms* at the school. Plan and specification or copies of the same can be seen at the school building in charge of the headmaster, or at the office of G. Dickens Lewis, M.S.A., county architect, 12, Terrace Road, Aberystwyth. Tenders, sealed and endorsed "Pontshan School Estimate," are to be delivered not later than midday on July 10 at the office of T. Thomas, clerk to the District Education Committee, Llandyssul.

July 10. Exeter.—*Alterations and additions* to Nos. 4 and 8, Higher Summerlands, Exeter, for the Guardians. Plans and specifications may be seen, and bills and quantities, together with form of tender, obtained at the offices of the architect and surveyor to the Guardians, R. M. Challice, 14, Bedford Circus, Exeter, upon payment of £1 1s. Sealed and endorsed tenders on the above form must be sent to Arthur Snell, clerk, New Buildings, Castle Street, Exeter, on or before July 10.

July 10. Isle of Wight.—*Repairs* to the Havenstreet School. Plans and specifications may be seen at the County Education Offices, Newport, I.W., or at the offices of the County Surveyor, St. Thomas's Street, Ryde, I.W. Sealed tenders, endorsed "Havenstreet School," should reach F. G. Flux, secty., County Educational Offices, Newport, I.W. not later than July 10.

July 10. Croydon.—*Erection of a school* for 1,200 children, proposed to be built in Davison Road, Croydon, in accordance with the drawings prepared by H. Carter, Pegg, F.R.I.B.A., of Thornton Heath. Bills of quantities and forms of tender can be obtained at the Committee's Office, upon payment of £1 1s. Applications should reach James Smyth, clerk to the Committee, Education Office, Katharine Street, Croydon, not later than June 20, and tenders must be delivered not later than noon on July 10, Tenders will only be received subject to the plans, specification and the terms of the draft contract, which will be deposited at the Committee's office and may be inspected during office hours.

July 10. London, S.W.—*Erection of two public elementary schools*, one to accommodate 836 children on the Lawn Lane site, South Lambeth Road, S.W., and the other to accommodate 804 children on the Franciscan Road site, Tooting Graveney, S.W., for the L.C.C. Persons desiring to submit tenders may inspect the drawings and specification and obtain the bills of quantities, forms of tender, and other particulars, at the Education Offices (Architect's Department), Victoria Embankment, W.C., upon payment to the Cashier of the sum of £5 in each case. Fair wages clause. Each tender must be enclosed in the envelope provided and delivered at the Education Offices, Victoria Embankment, W.C. (Room No. 119), not later than 11 a.m. on July 10, after which hour no tender will be received. Any tender which does not comply with the printed instructions for tender may be rejected.

July 10. Trewen.—*Improvements and repairs* to the school building. Plan and specification, or copies of same, can be seen at the school building in charge of the headmaster, or at the office of G. Dickens-Lewis, M.S.A., 12, Terrace Road, Aberystwyth. Tenders, sealed and endorsed "Trewen School Repairs," are to be delivered not later than midday on July 10 at the office of T. Thomas, clerk to the District Education Committee, Llandyssul.

July 11. Glamorgan.—*Erection* of (1) new mixed and infants' school at Kingsbridge, Gorseinon, near Swansea; (2) new offices and heating chamber, and converting existing privies into waterclosets, laying drains, &c., at Panteg Council School, near Ystalyfera; (3) building new cloak-rooms and heating chamber, and various alterations at Dunvant Council School, near Swansea; (4) building a new heating chamber at Gendros Infants' School, Swansea; (5) heating the following Council schools with low-pressure hot-water system:—Port Talbot Central, Panteg, Gendros (infants'), Coedfranc (girls), Glais (near Clydach), Tynewydd (Ogmore Vale and Miskin Village; (6) cleaning and painting various Council schools. Plans or documents for all the works may also be seen or obtained from T. Mansel Franklen, clerk of the Glamorgan County Council, Glamorgan County Offices, Westgate Street, Cardiff, to whom tenders must be delivered by July 11.

July 11. London, S.W.—*Alterations* in connection with two wards at the South-Western Fever Hospital, Landor Road, Stockwell S.W., for the Metropolitan Asylums Board. A copy of the specification, conditions of contract, bills of quantities, and form of tender can be obtained at the Office of the Board, Embankment, E.C., on payment of a deposit of £1. The drawings can be seen by intending contractors at the office of T. W. Aldwinkle & Son, architects, 20, Denman Street, London Bridge, S,E., on production of the specification or form of tender. Tenders, endorsed in accordance with the instructions on the form of tender, must be delivered at the Office of the Board by 10 a.m. on July 11.

July 11. Wolverhampton.—*Structural alterations* at two manual instruction centres and the erection of new centres at the rear of the Higher Grade School, New Hampton Road, Wolverhampton. Particulars and conditions may be obtained on application to T. H. Fleeming, architect to the Education Committee, 10, Queen Square, Wolverhampton. Tenders, addressed to "The Chairman, Sites Buildings and General Purposes Sub-Committee, Education Offices, Town Hall, Wolverhampton," must be received not later than noon on July 11. A deposit of £1 1s. must be forwarded with the application for bills of quantities and form of tender for which a receipt will be given. Fair wages clauses.

July 11. Newcastle-on-Tyne.—*Remodelling and extending* the Mason Dinnington (Mixed) Council School, situate near Newcastle-on-Tyne, also for the erection of a new infant Council school to accommodate 150 scholars, to be erected immediately adjoining the existing mixed school buildings, for the County Council Education Committee. Contractors will be required to tender for both works, and those desirous of tendering should forward their name and address to the undersigned not later than June 28, together with a deposit of £2 2s. Plans of both works may be inspected at the Committee's offices, and sealed tenders, endorsed "Tenders for Dinnington New School and Improvements," must be forwarded to C. Williams, secretary to the Education Committee, Pearl Buildings, Newcastle-on-Tyne, not later than 10 a.m. on July 11.

July 12. London, S.E.—*Repointing and external painting* at Melvin Road School, Penge, S.E. The specification may be seen and forms of tender obtained on payment of £1 1s. at the offices of the surveyor to the Committee, H. W. Longdin, Town Hall, Anerley, S.E. Sealed tenders, endorsed "Tender for Repointing ar Painting Melvin Road School," to be sent to C. Gordon Liddle, clerk to the Committee, the Court House, Anerley, S.E., by noon on July 12.

July 12. Wareham.—*Repairs and alterations* at the Workhouse. Specifications and particulars can be seen at the offices of W. W. Fookes, architect and surveyor, Wareham. Sealed tenders, endorsed "Tenders for Workhouse Repairs," to be sent to E. S. Clark, clerk, Union Offices, Wareham, not later than 10 a.m. on July 12.

July 12. Llanerchymedd.—*Additions and alterations* to the Council school, together with new infants' school, out-offices, boundary walls, &c. Plans and specifications may be inspected at the Llanerchymedd Council School, and at the office of J. Owen, F.R.I.B A., county architect, Menai Bridge. Tenders, endorsed "Llanerchymedd School," (on forms which will be supplied by the Architect), to be delivered to R. H. Williams, secretary of education, Education Offices, Llangefni, not later than 10 a.m. on July 12.

July 12. Dewsbury.—*Erection of a new head post-office* at Dewsbury. Drawings, specification and a copy of the conditions and form of contract may be seen on application to the Postmaster between 10 a.m. and 5 p.m. Bills of quantities and forms of tender may be obtained at the Office of Works on payment of £1 1s. Tenders must be delivered before noon on July 12, addressed to the Secretary, H.M. Office of Works, &c., Storey's Gate, London, S.W., and endorsed "Tender for Dewsbury Post-office."

July 13. Norwich.—*Enlargement* of Great Dunham School. Builders desirous of tendering should send in their names to the Secretary, Norfolk Education Committee, 57, London Street, Norwich, at which office plans and specifications can be inspected and bills of quantities obtained on and after July 6. A deposit of £1 1s. will be required. Tenders must be delivered by noon on July 13, addressed to "The Secretary," at the above address, and endorsed "Tender for Great Dunham School."

July 13. New Mills.—*Erection of a new boardroom* at the Workhouse, New Mills. Bills of quantities can be obtained, and plans and specifications inspected at the office of A. Walker, clerk to the Guardians of the Hayfield Union, Spring Bank, New Mills, to whom tenders must be delivered by July 13.

July 14. Manchester.—*Erection of* a manager's house at the Withington Sewage Works, Chorlton-cum-Hardy. Drawings may be inspected and bills of quantities and tender forms may be obtained on application to the Secretary of the Rivers Department, Town Hall, Manchester. Tenders must be enclosed in the official envelope provided expressly for the purpose (otherwise the tender will not be considered), and delivered at the above office not later than 10 a.m. on July 14.

July 14. Blackpool.—*For the whole of the work in the erection of a lecture-hall* at Claremont Congregational Church, Blackpool; also separate tenders for the various trades. Bills of quantities and other particulars may be obtained and plans inspected at the offices of the joint architects, Walter Wade, Bank Chambers, St. Anne s-on-Sea, and William Fielding, 12, Birley Street, Blackpool. Tenders, sealed, and endorsed "Tender for New Lecture Hall," must be addressed to the chairman, Rev. A. H. Boyden, B.A., B.Sc., 22, Clevedon Road, Blackpool, and delivered not later than July 14.

July 14. Coleford.—*Erection of* a transept to St. John's Parish Church, Coleford, Glos. Tenders to be delivered on form provided by July 14 next to Arthur H. Pearson, architect, Ross.

July 16. London, W.—*Erection of* new school, Drayton Green, West Ealing. The drawings and specification may be seen, and forms of tender, together with bills of quantities and other particulars, may be obtained from Charles Jones, M.I.C.E,, borough engineer, Town Hall, Ealing, W., any day during office hours, upon payment of a deposit of £5 5s. Sealed tenders, in the envelopes provided, endorsed "Tender for New School, Drayton Green," must be delivered at the office of J. B. Johnson, secty., Education Office, Town Hall, Ealing, W., not later than noon on July 16.

July 16. Beckenham.—*Erection of* extensions to and the modernization of the existing boys', girls' and infants' departments of the public elementary schools, Bromley Road, Beckenham, for the U.D.C. Drawings may be seen and bills of quantities, and forms of tender obtained on application to John A. Angell, surveyor, on the production of a receipt from the collector (who attends his office daily from 9 to 10 only, except on Tuesdays, when his hours are from 9 to 1) for a deposit of £5. Fair wages clause. Tenders, duly sealed and endorsed "Tenders for Bromley Road Schools," to reach F. Stevens, clerk of the Council, Beckenham, not later than 4 p.m. on July 16.

July 16. Cleckheaton.—*Four-storey mill and offices* at Prospect Mill, Cleckheaton, for Critchley, Sharp & Tetlow, Ltd. Plans may be seen and bills of quantities obtained at the offices of Howorth & Howorth, architects, Old Bank Chambers, Cleckheaton. Sealed and endorsed tenders to be sent to the office of the architects not later than noon on July 16.

July 16. London, W.—*Erection of* new school, Drayton Green, West Ealing. The drawings and specification may be seen and forms of tender, together with bill of quantities and other particulars, may be obtained from Charles Jones, M.I.C.E., borough engineer, Town Hall, Ealing, W., any day during office hours, upon payment of a deposit of £5 5s. Sealed tenders, in the envelopes provided, endorsed "Tender for New School, Drayton Green," must be delivered at the office of J. B. Johnson, secty., Education Office, Town Hall, Ealing, W., not later than noon on July 16.

July 16. Brithdir.—*Construction of roads and surface-water drains and the erection of ninety-nine* (*or less*) *houses*, in four blocks, at Brithdir, for the Cefn Brithdir Building Co., Ltd. Drawings and specification and bill of quantities of the roads, may be obtained at the offices of J. Llewellyn Smith, architect and surveyor, Merthyr and Aberdare. Sealed endorsed tenders to be sent to the secretary, H. Seymour Berry, 30, Victoria Street, Merthyr Tydfil, on or before 4 p.m. on July 16.

July 17. Rochester.—*Pulling down and removal* of certain houses in High Street, Strood Intra. Particulars and conditions of contract and form of tender can be obtained of William Banks, A.M.I.C.E., city surveyor, Rochester. Tenders are to be delivered at the Town Clerk's Office before 4 p.m. on July 17.

July 17. Edmonton.—*Alterations and additions* to the Brettenham Road School, together with the annual cleansing and repairs at their Brettenham Road and Croyland Road Schools. Persons desirous of tendering should send their names to the architect, Henry W. Dobb, Town Hall, Lower Edmonton, on or before Monday, July 2, when specifications, plans and form of tender will be forwarded. Fair wages clause. Tenders must be delivered to John Moule, secty., Education Offices, Brettenham Road, Upper Edmonton, on or before noon on July 17.

July 17. Llancadle.—*Re-seating, &c.*, Penmark Calvinistic Methodist Chapel, for the trustees. Plans and specifications may be seen with the Rev. D. Wynne Rees, Llancadle. Sealed and endorsed tenders to be sent to the Rev. D. Wynne Rees, The Manse, Llancadle, near Cardiff, on or before 5 p.m. on July 17.

July 17. Llancadle.—*Re-seating, &c.*, St. Athan Calvinistic Methodist Chapel, for the trustees. Plans and specifications may be seen with the Rev. D. Wynne Rees, Llancadle. Sealed and endorsed tenders to be delivered to the Rev. D Wynne Rees, The Manse, Llancadle, near Cardiff, on or before 5 p.m. on July 17.

July 19. Cultra.—*Erection of* a dwelling-house near Cultra Railway Station. Plans and specification may be seen and copies of the bill of quantities obtained at the office of Graeme-Watt & Tulloch, architects, 77A, Victoria Street, Belfast, on payment of a deposit of £1 1s., which will be returned to those contractors who submit a *bona-fide* tender. Sealed and endorsed tenders to be delivered at the above office not later than 10 a.m. on July 19.

July 24. Douglas (Isle of Man).—*Alterations and additions* to the Tynwald Street Schools (Girls Department). For plans and specifications apply to G. & W. R. Kay, architects, Athol Street, Douglas. Fair wages clause. Full particulars as to the time of the commencement and completion of the work and conditions upon which tenders will be received may be had from the Clerk of the School Board or the Architects. Sealed tenders, endorsed "Tenders for Alterations to Tynwald Street School," to be delivered at the Office of the Board on or before July 24.

July 25. Honiton.—*Taking down and removal* of the old brick arch and parapets, re-building the present abutments to a new line, and supplying and fixing an iron bridge. The plans, specification and form of contract can be seen at the office of the County Council at the Castle of Exeter, where tenders are to be sent on or before July 25.

July 25. Birmingham.—*Erection of six homes for epileptics and other works* on the Monyhull Hall Estate, near King's Heath, Birmingham, according to plans and specifications prepared by C. Whitwell and Son, architects to the Joint Committee. Builders desirous of tendering must apply to R. J. Curtis, clerk to the Joint Committee, Guildhall Buildings, Birmingham, in writing, and deposit the sum of £25 on or before June 30. Bills of quantities will then be forwarded, together with instructions as to the inspection of plans and drawings. The amount of the deposit will be returned by the Joint Committee's cheque to those who deliver a bona fide tender to me on or before July 25. No tender will be definitely accepted until the Local Government Board has finally approved the plans and estimates.

July 26. London, N.E.—*Erection of a central library building* in Mare Street, Hackney. Plans and specifications may be seen and bills of quantities, with conditions, form of tender and form of contract may be obtained at the offices of the architect, H. A. Crouch, A.R.I.B.A., 12, Gray's Inn Square, W.C., on and after July 6, on payment of £1 1s. Tenders, sealed and endorsed "Tenders for Central Library Buildings," to be deposited with W. A. Williams, town clerk, Town Hall, Hackney, not later than 5 p.m on July 26.

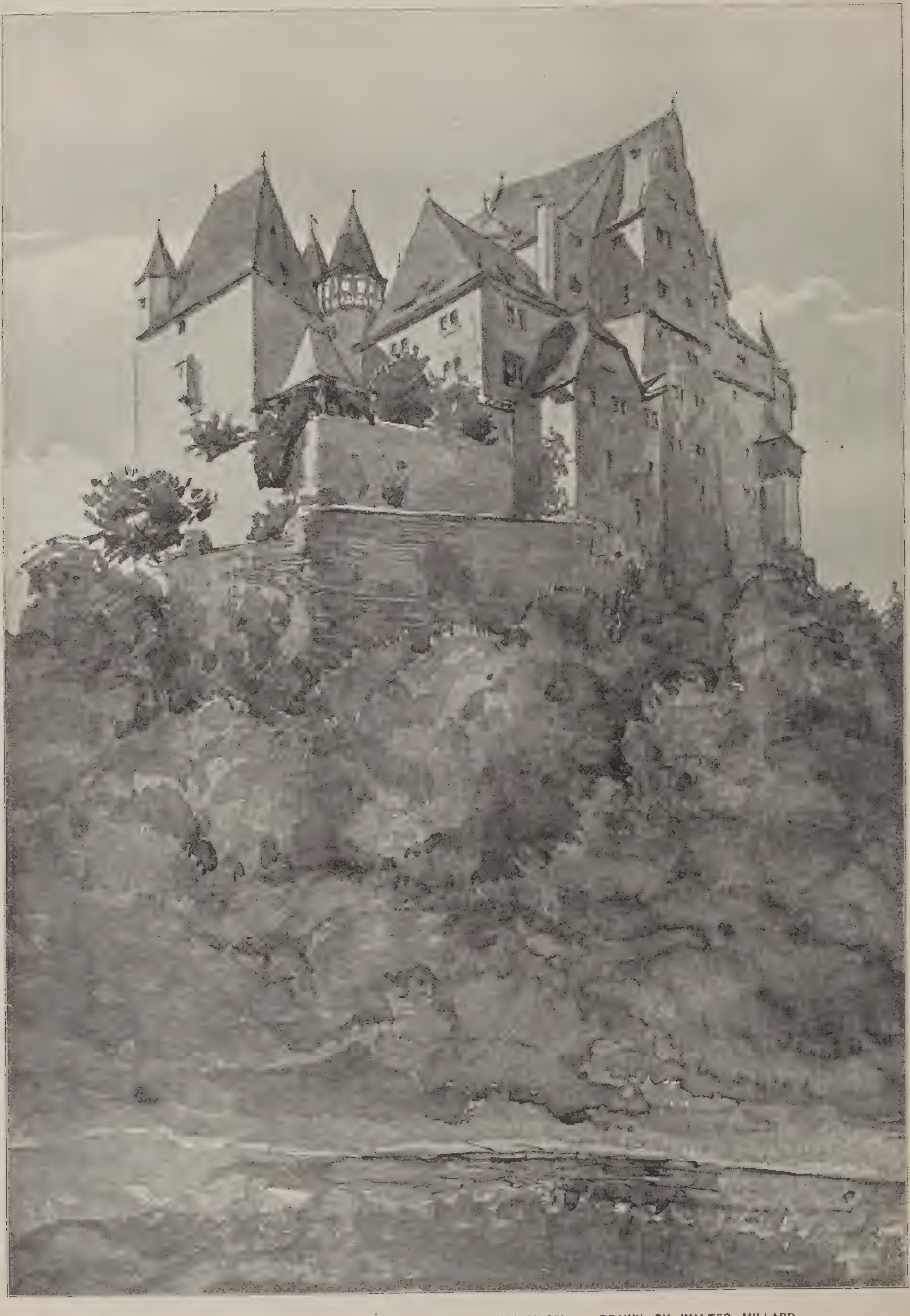
August 16. Antwerp.—*Reconstruction of* the Government Bonded Warehouses, known as the "Nord-Ancien and Nord-Nouveau." The specification ("*Cahier des charges*," No. 1,144) relating to the contract may be obtained from the Hôtel de Ville, Antwerp, at a cost of 2 francs. All tenders should be sent in sealed registered envelopes, addressed "A Monsieur le Bourgmestre en l'Hôtel-de-Ville d'Anvers," and should reach the Hôtel de Ville not later than August 16. A deposit of £1,000 is required to qualify any tender. A copy of the specification may be seen at the offices of the Commercial Intelligence Branch of the Board of Trade, 73, Basinghall Street London, E.C.

No date. Starnthwaite.—*Erection of* a laundry a the Training Home for Epileptic Children. Plans and specifications can be seen and other information obtained by applying at the offices of John Stalker, M.S.A., architect, Kendal.

No date. Hyde.—*Alterations* to galleries, &c., and new rostrum, for the Wesleyan Chapel, Norfolk Street, Hyde. Plans and specifications can be seen and quantities obtained on receipt of half-a-guinea (which amount will be returned when *bona-fide* tender is received) to Joseph Lindley, architect and surveyor, Town Hall Chambers, Hyde.

No date. Shenfield.—*Erection of a pair of cottages* adjoining the "Eagle and Child" at Shenfield, Essex. To inspect plans, &c., apply to R. Burgess, Red House, Shenfield.

(*Continued on p.* xxii.)



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WARINGS, having at their manufactories at Hammersmith, Liverpool, and Lancaster, machinery of an unequalled character, are able to execute Panelling, Carved Woodwork, Parquet Flooring, and Wood Chimney-pieces, in the best style and of the best workmanship, at exceptional prices.

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THE PERFECTED ENAMEL PAINT,

Has succeeded in a remarkable manner. Architects are now specifying it, discriminating decorators who have used it are unanimous in their agreement with us that:

1. It is cheaper than any first-class enamel obtainable.
2. It is not excelled in quality by the highest price enamel on the market.
3. The excellent spreading power possessed by **Japonika** (1 gallon will cover 70 to 90 square yards) renders it a very cheap material apart from its cost per gallon.

To DECORATORS.

You will doubtless be called upon during the coming season to carry out many jobs in which enamel will be required. Make yourself acquainted with the merits of **JAPONIKA now. Its use will enable you to maintain your reputation for high-class work, and at the same time save money.**

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(Colour Department)
NOTE NEW ADDRESS:
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LONDON, W.C.

Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, *Great New Street, Fetter Lane, E.C.*

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Bridestowe.—For the erection of a new Bible Christian Church at Bridestowe, near Okehampton. Mr. Francis J. Worden, architect and surveyor, Okehampton :—

Pethick & May, Lidford	£969	0	0
Avery & Blatchford, Okehampton	906	10	0
White & Dawe	868	5	0
N. C. Worden	863	0	0
White & Blatchford*	789	0	0

* Accepted. [Rest of Bridestowe.]

Burnley.—Accepted for the erection of a new school in Fulledge, for the Education Committee. Mr. G. H. Pickles, borough surveyor :—

Brickwork—Mullen & Durkin	£7,890
Joiners—Clegg Brothers	2,595
Plumber—J. Smith	930
Slater—W. Schofield	797
Plasterers—Rawlinson & Son	742
Ironfounder—W. Walton	505
Painter—W. Hill, Nelson	361

[Rest of Burnley.]

Cefn Hirgoed.—For the erection of a small-pox hospital at Cefn Hirgoed, near Bryncethin, Bridgend, for Ogmore Small-pox Hospital Committee. Mr. H. Dawkin Williams, architect, Blackmill. Quantities by architect :—

F. C. Williams	£4,180
D. W. Davies	4,090
P. Gaylard,* Bridgend	3,695

* Accepted.

Draycott.—For Victoria Mills extension, Draycott. Mr. F. S. Antliff, architect and surveyor, Draycott. Quantities by architect :—

E. Hind	£7,955	0	0
H. Vernon	7,940	0	0
W. Gell & Son	7,922	11	0
Walker & Slater	7,797	0	0
W. Woodsend	7,705	0	0
R. Weston & Son	7,637	0	0
A. Smith	7,619	0	0
W. Maule & Co.	7,600	0	0
J. Parker & Son	7,356	0	0
J. Brown & Son	7,295	0	0
F. Messom	7,286	0	0
F. Perks & Son	7,277	0	0
T. W. Youngman	7,275	10	0
H. Vickers & Son	7,270	0	0
W. Ford & Sons	7,237	0	0
J. Dickinson	7,198	0	0
J. Wright	7,155	0	0
T. Barlow & Co.	6,860	0	0
J. & J. Warner, Mickleover, near Derby	6,840	0	0

* Accepted.

Lanchester.—Accepted for the erection and completion of new branch store at Lanchester, co. Durham, including three shops, warehouse, manager's house, stabling, &c., for the Annfield Plain Industrial Co-operative Society :—

W. Lodge, Durham	£2,867	5	0

Langwith Bassett.—For the erection of a new mixed school at Langwith Bassett, for the Derbyshire County Education Committee. Mr. H. Tatham Sudbury, architect, Estate Offices, Ilkeston. Quantities by architect :—

Haskard, Rudkin & Beck	£3,560	0	0
G. G. Middleton	3,325	0	0
H. Chattle	3,260	0	0
G. Haynes	3,249	8	0
W. Ford & Sons	3,217	0	0
Moule & Co.	3,199	0	0
A. Earnshaw	3,172	0	0
J. Greenwood	3,149	0	0
A. Eastwood & Sons	3,120	0	0
C. Vallance	3,090	0	0
H. Vickers & Son	3,067	0	0
Lund & Swan	3,019	0	0
D. Roberts	2,989	0	0
J. & J. Warner	2,966	0	0
Lee & Kirk	2,965	0	0
F. H. & J. W. Moore	2,900	0	0
Harris & Hunt,* Ripley	2,850	0	0

* Accepted.

London.—Accepted for the erection of new board-room and offices, for the St. George's Guardians :—

C. Dearing, Islington	£22,737

London, E.—For the erection of shop in Gun Street, E. Messrs. H. W. & E. J. Caston, surveyors, Ulleswater Road, Palmer's Green, N. :—

Johnson Brothers	£653
G. F. Brady & Son	651
S. Blow	630
A. E. Symes	531
J. V. Kiddle & Son	529
G. Barker*	519

* Accepted.

London, S.W.—For the erection of two patients' blocks, recreation hall, and supplementary staff accommodation at Tooting Bec Asylum, for the Metropolitan Asylums Board :—

J. Barker & Co., Kensington	£39,766
Foster & Dicksee, Rugby	39,639
R. Wilkins & Sons, Bristol	38,844
Leslie & Co., London, W.	37,873
Cropley Brothers, Epsom	37,837
Stephens & Son, Exeter	37,796
W. Smith & Sons, Croydon	37,548
Edwards & Medway, Kennington	36,855
Perry Brothers, London, E.C.	35,977
Perry & Co., Bow	35,550
Martin, Wells & Co., Vauxhall	35,190
McCormick & Sons, Canonbury	£35,158
Rowe & Co., Clapham	34,900
Patman & Fotheringham, Islington	34,678
Galbraith Brothers, Camberwell Green	34,675
Turtle & Appleton, Clapham Junction	34,633
Thomas & Edge, Woolwich	34,590
J. Allen & Sons, Kilburn	34,500
W. Moss & Sons, Loughborough	34,364
Wisdom Brothers, Isleworth	34,050
H. Lovatt, Ltd., Wolverhampton	34,030
J. & C. Bowyer, Upper Norwood	33,920
J. & M. Patrick, Wandsworth	33,669
W. Johnson & Co., Wandsworth Common	33,660
W. Lawrence & Son, Waltham Cross	33,484
Kirk & Randall, Woolwich	33,398
B. E. Nightingale, London, S.E.	33,230
F. & H. F. Higgs, Herne Hill	33,180
T. Rowbotham, Birmingham	32,727
E. Wall, Tooting, S.W.	32,700
G. E. Wallis & Sons, Maidstone	32,230
Rowley Brothers, Tottenham	32,000
C. Wall, Ltd., London, E.C.	31,800
T. J. Hawkins & Co., London, S.W.	31,312
J. Garrett & Sons,* 83, Balham Hill, S.W.	31,295
E. J. Clayton,† London, W.	29,300

[Engineer-in-chief's revised estimate, £33,000.]

* Recommended for acceptance. † Withdrawn.

London, W.—Revised tenders for the proposed motor-car works (Messrs. Panhard & Levassor), showrooms and offices, &c., Uxbridge Road and Worple Way, Acton, W., for Mr. Harvey du Cros, M.P. Mr. Harry Percival, architect, 12, Craven Street, W.C. Quantities by Mr. F. A. Bruin, 12, Craven Street, W.C. :—

Spencer, Santo & Co.	£14,197
J. C Richards & Co.	13,479
Minter,* London	13,257
J. Dorey & Co.	13,154

* Further reduced and accepted at £12,975.

Maidenhead. — For the erection of new Council schools, for the Corporation of Maidenhead. Mr. E. J. Shrewsbury Queen Street Chambers, Maidenhead : —

W. E. Theaker	£8,430
C. W. Cox & Sons	8,397
W. Creed	8,397
J. K. Cooper & Sons	8,195
Silver & Sons	7,995
F. Bissley*	7,920

* Accepted.

Okehampton.—For the erection of a residence in Station Road, for James Oag. Mr. Francis J. Worden, architect, and surveyor, Okehampton :—

W. Chapman	£1,050	0	0
S. T. Geen, Son & Co.	1,045	10	0
J. J. Sleeman	999	0	0
G. K. Blatchford	989	0	0
J. Kerslake & Son*	980	0	0

* Accepted. [All of Okehampton.]

Okehampton.—For the erection of gates and fencing to pleasure-ground, for Okehampton Borough Council. Mr. Francis J. Worden, architect and surveyor, Okehampton :—

Day & Sons	£240	0	0
G. K. Blatchford	229	0	0
Avery	200	10	0
Farse & Sons*	197	12	0

* Accepted. [All of Okehampton.]

Rottingdean.—For the erection of two pairs of farm labourers' cottages on land adjoining the Warren Farm Schools, in the parish of Rottingdean, for the Brighton Board of Guardians :—

W. Brown & Sons	£1,395	0	0
H. J. Penfold	1,347	0	0
Sattin & Evershed	1,325	0	0
Hockley & Co.	1,290	0	0
C. Duke	1,222	0	0
W. Olliver	1,129	13	0
Saunders Brothers	1,099	0	0
J. & W. Simmonds,* Ashford Road	1,089	0	0

* Accepted. [All of Brighton.]

Whittington.—Accepted for the erection of a school at Gobowen, for the Elementary Education Department. Messrs. Shayler & Ridge, architects, Oswestry :—

W. H. Thomas, Salop Road, Oswestry	£2,992

Wrekenton.—For the erection of a new Wesleyan chapel and school. Mr. J. Orwin, architect and surveyor, 20, Collingwood Street, Newcastle-on-Tyne :—

D. Elliott	£1,595	0	0
J. Nulne	1,527	14	0
Glen & Moffitt	1,516	19	8
W. Hall	1,455	10	7
Arnell	1,399	6	2
Bolam	1,375	0	0
J. White	1,353	0	0
North Durham Stone Co.	1,329	0	0
W. E. Hall	1,269	0	0
E. Dyson	1,225	12	6
W. H. Ayton	1,200	0	0
R. Davidson,* Felling	1,196	0	0

* Accepted.

HALL'S SANITARY WASHABLE DISTEMPER

The Modern Wall Covering.

The most popular wall covering of to-day is Hall's Sanitary Washable Distemper. It works easily, sets hard and dries with a uniform surface, equal to flatted oil paint.

It is made in 73 colours, including rich dark as well as light shades.

One cwt. of Hall's Distemper mixed with water to the consistency of cream, will cover double the surface of one cwt. of pure White Lead Paint and save 40 per cent. of the cost of labour.

"**Sisco" White Japan** is the correct material for painting Doors, Picture Rails, and all Woodwork of rooms decorated with Hall's Distemper. "Sisco" Japan is a pure white decorators' enamel, which dries with a hard, smooth lustrous surface. It lasts for many years with beauty unimpaired.

Samples and full particulars on application to
SISSONS BROTHERS & Co., Ltd.,
HULL,
Manufacturers of Colours, Varnishes, Paints and all materials for Decorators' use.

London Office—
199B, Boro' High Street, S.E.

Current Market Prices

FORAGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	13	0	1	16	0
Clover, best	per load	4	0	0	4	7	6
Hay, good	do.	3	12	6	3	17	6
Sainfoin mixture ...	do.	3	10	0	4	0	0
Straw	do.	1	8	0	1	14	0

MISCELLANEOUS.

		£	s.	d.	£	s.	d.
Bricks Stocks, d/d to job	per 1,000	1	15	0	—		
Do. Flettons on rail ...	do.	1	5	0	—		
Do. Pressed Wire Cuts, d/d to job ...	do.	1	17	0	—		
Do. Blue brindled wire cuts	do.	1	2	0	—		
Do. do. wire cuts ...	do.	1	6	0	—		
Do. do. pressed facings	do.	1	17	6	—		
Coke Breeze, into carts at gasworks ...	per load	0	2	0	—		
Do. d/d to job ...	do.	0	4	0	—		
Sand	per yard	0	7	6	—		
Ballast	do.	0	6	6	—		
Granite Chippings ...	do.	0	10	6	—		
Do. do. ¾in.	do.	0	11	6	—		
Granite Broken, 1½in. ...	do.	0	15	6	—		
Do. do. 2in. ...	do.	0	15	0	—		
Do. do. 2½in. ...	do.	0	14	6	—		
Do. Kerb, Norwegian, 6×12 and 12×6 in river	per foot	0	1	2	—		
Do. do. do. circular	do.	0	1	5	—		
Do. do. do. 12×8 in river	do.	0	1	5	—		
Do. do. do. circular	do.	0	1	8	—		
Do. do. Guernsey, 6×12 in river	do.	0	1	4	—		
Do. do. do. circular	do.	0	1	6	—		
Do. do. do. 12×6 do.	do.	0	1	6	—		
Do. do. do. do.	do.	0	1	8	—		
Do. do. do. 18×8 do.	do.	0	1	8	—		
Do. do. do. do.	do.	0	1	10	—		
Do. Pitchings, Norwegian, 3×6	per ton	1	8	0	—		
Do. do. do. 3×7	do.	1	10	0	—		
Do. do. do. 3×5	do.	1	9	0	—		
Do. do. do. 4×5	do.	1	8	0	—		
Do. do. do. 4×4	do.	1	13	0	—		
Do. do. do. 4×6	do.	1	5	0	—		
Do. do. do. 5×6	do.	1	4	0	—		
Do. do. do. 5×7	do.	1	4	0	—		
Do. do. do. Special, 4×6	do.	1	11	0	—		
Do. do. do. do. 5×7	do.	1	18	0	—		
Do. do. Guernsey, 3×6	do.	1	10	0	—		
Do. do. do. 3×7 & 3×9	do.	1	8	6	—		
Do. do. do. 3×5	do.	1	10	0	—		
Do. do. do. 4×5	do.	1	10	0	—		
Do. do. do. 4×4	do.	1	13	0	—		
Do. do. do. 4×6	do.	1	9	0	—		
Do. do. do. 4×7	do.	1	6	6	—		
Do. do. do. 5×6	do.	1	6	0	—		
Do. do. do. 5×7	do.	1	5	0	—		
Do. do. Specials add.	do.	0	6	0	—		
Glass, English Sheet, in crates of stock sizes, 15 oz., 2nds	per sq. ft.	0	0	3½	—		
Do. do. do. do. 3rds,	do.	0	0	2½	—		
Do. do. do. 21 oz. 2nds	do.	0	0	5	—		
Do. do. do. do. 3rds	do.	0	0	3½	—		
Do. do. do. 26 oz. 2nds	do.	0	0	6	—		
Cement	per ton	1	12	0	—		
Lime	do.	1	4	0	—		
Castor Oil, French ...	per cwt.	1	1	10	1	2	0
Colza Oil, English ...	do.	1	6	3	—		
Copperas	per ton	2	0	0	—		
Lard Oil	per cwt.	2	15	0	2	17	0
Lead, white, ground, carbonate	per ton	16	0	0	—		
Do. red	do.	15	0	0	0	19	0
Linseed Oil, barrels ...	per cwt.	1	0	3	—		
Petroleum, American ...	per gal.	0	0	6¼	—		
Do. Russian ...	do.	0	0	5¾	—		
Pitch	per barrel	0	8	0	—		
Shellac, orange	per cwt.	10	5	0	—		
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Town	per cwt.	1	7	6	1	8	3
Tar, Stockholm	per barrel	1	5	0	—		
Turpentine	per cwt.	2	5	6	—		

METALS.

		£	s.	d.	£	s.	d.
Standard Copper ...	per ton	81	0	0	81	10	0
Do. Strong sheets...	do.	96	0	0	96	10	0
Lead, Soft Foreign ...	do.	16	10	0	16	15	0
Do. English	do.	16	15	0	17	0	0
Do. pipes	do.	19	15	0	19	17	6
Do. sheets	do.	19	5	0	19	10	0
Galvanised Corrugated sheets	do.	12	12	6	12	15	0
Spelter G.M.	do.	27	0	0	27	10	0
Angles, Scotland... ...	do.	6	15	0	7	0	0
Bars do.	do.	7	17	6	7	19	0
Marked bars, Staffs ...	do.	9	0	0	—		
Common bars do. ...	do.	6	7	6	6	10	0
Angles, M'boro.	do.	6	10	0	6	12	6
Joists do.	do.	6	2	6	6	5	0
Angles, Midlands ...	do.	6	10	0	6	15	0
Joists do.	do.	6	15	0	7	0	0
Girder plates, Midlands .	do.	7	10	0	7	12	6
Angles, Foreign, c.i.f. Thames	per ton	6	12	6	6	14	0
Tees do. do. do.	do.	6	15	0	6	17	6
Joists do. do. do.	do.	6	2	6	6	5	0
Channels do. do. do.	do.	6	7	6	6	10	0
Plates do. do. do.	do.	7	0	0	7	5	0
Tin, Foreign	do.	177	0	0	178	0	0
Do. English ingots ...	do	177	0	0	180	0	0
Zinc, sheets, Silesian ...	do.	30	0	0	30	10	0
Do. do. Vielle Montaigne	do.	30	0	0	—		

TIMBER.

SOFT WOODS.

		£	s.	d.	£	s.	d.
Fir, Dantzic and Memel	per load	3	0	0	5	0	0
Pine, Quebec, Yellow ...	do.	4	0	0	7	0	0
Do. Pitch, American	do.	3	15	0	5	0	0
Laths, log, Dantzic ...	per cu.fath.	4	0	0	6	0	0
Deals, Archangel, White, 2nd, 3×9	per std.	10	5	0	—		
Do. do. do. 2nd, 3×9	do.	10	0	0	—		
Do. do. Yellow, Dry, 3rd, 3×8	do.	10	5	0	—		
Do. do. White, 4th, 3×11	do.	8	15	0	—		
Do. do, Yellow, 4th, 4×9	do.	10	5	0	—		
Do. Mariehill, Yellow, 5th, 3×11	do.	9	0	0	—		
Do. Nederkalix, Yellow, 1st, 3×9	do.	12	5	0	—		
Do. Hudikswall, Yellow and White, 3×7	do.	7	0	0	—		
Do. Mo, Yellow, 5th, 3×7	do.	9	0	0	—		
Do. Quebec, Spruce, Unsorted, 2½×7	do.	8	15	0	—		
Battens, Oscarshamn, Yellow, 1st & 2nd, 2×10	do.	8	15	0	—		
Do. do. do. 1st & 2nd, 2×9	do.	10	0	0	—		
Do. do. do. 1st & 2nd, 2×6½	do.	9	15	0	—		
Do. Ingramport, White, Unsorted, 2½×6½	do.	6	15	0	—		
Do. do. do. do. 2×6	do.	6	15	0	—		
Do. Archangel, Yellow, 5th, 2×9	do.	9	15	0	—		
Do. do. do. 5th, 2×8	do.	9	5	0	—		
Do. Söderhamn, Yellow, Inf., 5th, 2×9	do.	9	0	0	—		
Do. Mo, Yellow, 2nd, 2×7	do.	9	15	0	—		
Do. do. do. Inf., 5th, 2×7	do.	8	15	0	—		
Do. Stocka, Yellow, 2×7	do.	6	0	0	—		
Do. do. do. 2×5	do.	6	0	0	—		
Do. Skutskar, Yellow, 1st & 2nd, 2×4½	do.	9	5	0	—		
Floorings, Mo & Domsjo, Yellow, 1st, 1×7	per square	0	12	6	—		
Do. Gefle, Yellow, 1st, 1×5	do.	0	11	0	—		
Do. do. do. 1st, 1×6	do.	0	11	0	—		
Do. do. do. 3rd, 1×5	do.	0	9	6	—		
Do. do. do. 3rd, 1×7	do.	0	10	0	—		
Do. Sikea, Yellow, 2nd, 1×7	do.	0	11	3	—		
Do. do. do. 2nd, 1×5	do.	0	10	0	—		
Do. do. do. 3rd, 1×7	do.	0	10	3	—		
Do. do. do. 3rd, 1×5	do.	0	9	6	—		
Do. Skutskar, White, 2nd, 1×6½	do.	0	10	3	—		
Do. Sandarne, Yellow, 2nd, 1×6	do.	0	11	3	—		
Do. Fredriksstad, Yellow and White, 1×7	do.	0	8	9	—		
Do. do. do. do. 1×7	do.	0	8	3	—		
Do. do. do. do. 1×6	do.	0	8	6	—		
Do. do. Yellow, Mixed, 1×6	do.	0	9	9	—		

HARD WOODS.

		£	s.	d.	£	s.	d.
Ash, Quebec	per load	4	2	6	7	5	0
Birch, New Brunswick...	do.	2	10	0	5	0	0
Do. Quebec	do.	3	0	0	5	5	0
Box, Turkey	per ton	6	0	0	20	0	0
Cedar, Cuba	per ft. sup.	0	0	6	—		
Do. Honduras ...	do.	0	0	5$\frac{3}{32}$	—		
Do. Tobasco ...	do.	0	0	5⅜	—		
Elm, Quebec	per load	4	2	6	8	10	0
Jarrah, plank	per ft. cu.	0	2	6	0	3	0

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—Adjudication.]

DURING THE WEEK ending June 29th twenty-three failures in the building and timber trades in England and Wales were gazetted.

W. J. CAINE, builder, Headley. Adj. June 23rd.

W. PRICE, builder, Three Cocks. Adj. June 22nd.

J. B. HENCHER, builder, Worcester. Gross liabilities, £212; assets £49.

MYERS & LEWIS, builders, Hull. Liabilities £1,088; assets £42.

WILES & HUNTER, builders, Hull. Liabilities £516 assets £22.

S. PINNIGAR, plumber and house decorator, Wotton-under-Edge. Gross liabilities £188; deficiency £114.

E. H. WALLIS & Co., builders, Fulham. Unsecured debts £4,172; assets £5.

T. & C. PANTER, builders and contractors, Drakes Broughton. Deficiency £956.

M. HOLT, painter, late builder and decorator, Guildford (late Maidstone and Hainetsham) R.O. June 21st.

T. McISAAC, builder and contractor, East Sheen. R.O. June 19th.

M. REECE, plasterer and contractor, Clapham. Adj. June 19th.

T. H. SCOTT, architect and surveyor, Brighton. R.O. June 21st.

J. H. NEAT, painter and decorator, Warminster. R.O. June 21st.

A. BARNES, builder, painter and paperhanger. R.O. June 18th.

T. BARKER & Co., glass, lead, oil and colour merchants, Southall. R.O., June 16th.

A. B. JACKSON, builder and contractor, Crouch End. First meeting, London Bankruptcy Court, July 9th, at 2.30. P.E., same, July 26th, at 11.

A. E. THOMPSON, architect and surveyor, Hull. First meeting, O.R.'s, Hull, July 4th, at 11. P.E., Hull C.C., July 16th, at 2.

FUGE & ROSSER, builders and contractors, Swansea. First meeting, O.R.'s, Swansea, July 5th, at 12. P.E., Swansea Town Hall, July 20th, at 11.30.

Coming Events.

Thursday, July 5.

CHEMICAL SOCIETY.—Ordinary meeting at 8.30 p.m.

NORTHERN ARCHITECTURAL ASSOCIATION.—Annual Excursion to Beverley.

Friday, July 6.

SANITARY ENGINEERS.—Summer meeting, Manchester.

Saturday, July 7.

SANITARY ENGINEERS.—Summer meeting, Manchester.

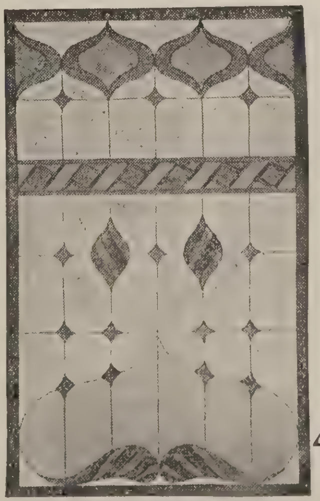
ARCHITECTURAL ASSOCIATION.—Sixth Summer Visit, to Oxford.

Monday to Saturday, July 9 to 14.

ROYAL SANITARY INSTITUTE.—Twenty-third Congress at Bristol.

Monday to Saturday, July 16 to 21.

INTERNATIONAL CONGRESS OF ARCHITECTS, LONDON.



"CLOISONNE GLASS"
WEATHER RESISTING.
Production 1905—25,000 square feet.
The CLOISONNE GLASS CO.
40E Berners St., Oxford St., London, W.
Branch Office:—
23, Old Queen Street, Westminster, S.W.
Prices from 3/- per square foot.

CONTRACT LIST (*continued from p.* 13).

ENGINEERING.

July 6. Wallasey.—*Extension of refuse destructor* (not buildings), for the U.D.C., the specification of which and further particulars may be obtained on application to W. H. Travers, engineer and surveyor, Public Offices, Egremont, Cheshire. A charge of £3 will be made. Tenders, enclosed in sealed envelopes, endorsed "Tender—Refuse Destructor," and addressed to H. W. Cook, clerk and solicitor, Public Offices, Egremont, Cheshire, to be forwarded per post not later than July 6.

July 6. Warwick.—*Construction of covered service reservoir* (capacity about 500,000 gallons), and the provision, laying and jointing of about 500 yds. of 12in. and 8in. cast-iron pipes, together with all special castings and valves required; also for the erection of engine-house and gas-producer house, and other works in connection therewith, in accordance with the plans, sections, detail drawings and specification prepared by the Engineers. Plans and specification may be seen and form of tender and bills of quantities obtained at the offices of the engineers, Wilcox & Raikes, 63, Temple Row, Birmingham, on payment of a deposit of £3 3s. The tenders must be sent in under seal in envelopes supplied, endorsed "Warwick Water Supply, Contract No. 4," to Brabazon Campbell, town clerk, Warwick, not later than noon on July 6.

July 7. Teignmouth.—*Laying and jointing of about* 17,110 *lineal yds. of 9in., about* 1,120 *lineal yds. of 6in., and about* 5,850 *lineal yds. of 4in. British Mannesman steel pipes*, including haulage of pipes from various railway stations (a separate contract having been entered into for the supply of the pipes), together with the erection of a meter-house and the provision of all necessary sluice, air and other valves, washouts, meters, chambers and incidental works, including the crossing of the tidal river Teign, about one-fourth of a mile in width. Plans may be seen and copies of the general conditions, specification, bills of quantities and form of tender obtained on application at the office of C. F. Gettings, engineer, Town Hall, Teignmouth, on payment of a deposit of £5. Sealed tenders, upon the form supplied, addressed to A. Percival Dell, clerk to the Council, Town Hall, Teignmouth, Devon, and endorsed "Teignmouth Water Scheme, Contract No. 2," must be delivered on or before July 7. Fair wages clause.

July 9. New Zealand.—*Tunnel.* Alternative tenders will be received at the Office of the High Commissioner for New Zealand, Westminster Chambers, 13, Victoria Street, London, S.W., for the construction of a tunnel 5 miles 24½ chains in length at Arthur's Pass, through the dividing range between Canterbury and Westland, on the route of the New Zealand Midland Railway. They are to be addressed to the High Commissioner for New Zelaand, 13, Victoria Street, Westminster, S.W., and marked on the outside "Tender for Arthur's Pass Tunnel—60 months" (or "48 months"). Tenders will be received up till noon on July 9. Specifications, conditions, tender forms and other information may be obtained on application to the High Commissioner upon payment of a deposit of £10. Plans can also be inspected at the High Commissioner's Office.

July 9. Dublin.—*Electric works* at the Royal Irish Academy House, Dawson Street, and at the Science and Art Buildings, and Leinster House, Kildare Street, Dublin. The plans and specification can be seen at the Office of Public Works, where also forms of tender may be obtained. The envelope containing the tenders must be endorsed; and tenders must be sent in to the Office of Public Works not later than 10 a.m. on July 9.

July 9. Dublin.—*Supply of sub-station switchboards and accessories, transformer pillars.* Specifications, with general conditions and form of tender, can be obtained from the City Electrical Engineer, Fleet Street, Dublin, on payment of £1 1s, for each specification. Tenders, addressed "Chairman of the Lighting Committee, 3, Cork Hill, Dublin," and marked "Tender for Sub-Station Switchboards, Transformer Pillars, &c.," to be delivered not later than July 9.

July 10. London, W.C.—*Laying of* about 3,000 yds. of water-main from Plumstead Common to Woolwich Common Reservoir, in the Kent District, for the Metropolitan Water Board. Forms of tender, with schedule and conditions of contract, may be obtained on application to the District Engineer at the Board's Offices, Bookmill Road, Deptford, S.E. Such application must be made between 10 and 4 (except on Saturdays). Tenders, enclosed in sealed envelopes addressed to the Clerk of the Board, and endorsed "Tender for Pipelaying, Kent District," must be delivered at the Offices of the Board not later than 10 a.m. on July 10.

July 11. London, S.W.—*Work and materials* required in the construction of the permanent way (for electric traction), bridge work, road widenings, &c., for Contract No. 17, for the Middlesex County Council. Railway No. 1 (Order 1903). A line of double track (with crossovers, contingent works, &c.) to be laid along Green Lanes, in the districts of Wood Green and Southgate, in the county of Middlesex, to a length of 3 miles 0 furlongs, 4 chains, or thereabouts. The plans, conditions of contract, specification of works, &c., for this contract may be seen and schedule of quantities obtained by intending contractors, on payment of £10, on application to H. T. Wakelam, M.I.C.E., county engineer, Middlesex Guildhall, Westminster, S.W. Tenders, properly sealed and endorsed "Tender for Light Railway No. 1," to be delivered to Sir Richard Nicholson, clerk of the County Council, Middlesex Guildhall, Westminster, S.W., not later than noon on July 11.

July 12. Ciney (Belgium).—*Installation of new pumping apparatus* for the water-supply works. Particulars may be obtained from the Secretariat Communal, Ciney Namu. Tenders to be sent in by July 12.

July 12. Bolton.—*Supply, delivery and erection of condensing apparatus.* Specification and form of tender may be had on application to Arthur A. Day, A.M.I.C.E., M.I.E.E., borough electrical engineer and tramways general manager, Spa Road, Bolton. Tenders, endorsed "Condensing Apparatus," to be addressed to the Chairman of the Electricity Committee, Town Clerk's Office, Town Hall, Bolton, and must be delivered not later than noon on July 12.

July 14. Madrid.—*Erection of a cement or "biton" bridge* over the Ebro River at Saragossa. For particulars apply to Direccion General de Obras Publicas, Madrid. Tenders to be sent in by July 14.

July 16. Wallasey.—*Supply and delivery of alternating current transformers* required during the next two years, for the U.D,C. Copies of the specification may by obtained on application to the engineer, J. A. Crowther, at his office, Seaview Road, Liscard. A charge of £1 1s. will be made for each copy of the specification. Sealed tenders on the form provided for the purpose, endorsed "Tender for Transformers," to be delivered to H. W. Cook, clerk and solicitor, Public Offices, Egremont, Cheshire, on or before July 16.

July 17. Birmingham.—*Widening* the Viaduct, &c., between Great Charles Street and Hockley Station, Birmingham, for the G.W.R. Plans and specification may be seen and forms of tender and bills of quantities obtained at the office of the New Works Engineer at Paddington Station, between 10 a.m. and 4 p.m. Tenders, addressed to G. K. Mills, secty., Paddington Station, London, and marked outside "Tender for Widening Viaduct, &c., Birmingham," will be received on or before July 17.

July 20. Leeds.—*Construction of* four filter beds, clear-water tank, meter house, the making of roads, laying of pipes and drains, &c., in connection therewith, at the site of the new filter beds, Otley Road, Headingley, Leeds. Plans may be seen and the specification, bill of quantities, and form of tender obtained at the office of C. G. Henzell, M.I.C.E., waterworks engineer, Municipal Buildings, Leeds, on payment of a deposit of £5. Tenders, endorsed "Tender for New Filter Beds, &c., at Headingley," must be addressed to the Chairman of the Waterworks Committee, and delivered in a sealed cover at the Town Clerk's Offices, Town Hall, Leeds, not later than 10 a.m. on July 20.

July 20. Birmingham.—*Construction of a covered filtered water reservoir and connections* at the Frankley Waterworks, Northfield, near Birmingham. The drawings may be seen and specifications and bills of quantities obtained at the offices, 44, Broad Street, Birmingham, on and after July 2, on the deposit of the sum of £5. The site at Frankley may be inspected by appointment from July 2 to July 6 inclusive. Early application for particulars is necessary, as only a limited number will be given out, and none after July 6. Fair wages clause. Sealed tenders, endorsed "Tender for Works at Frankley," are to be delivered to E. Antony Lees, secty., 44, Broad Street, Birmingham, at or before noon on July 20.

July 24. Thornaby.—*Renewal of the superstructure of the bridge* carrying the passenger lines over the River Tees near Thornaby, Stockton, and the construction and erection of new steel bridge of five spans, of a total length of about 340 feet, including about 360 tons of steel-work for the North-Eastern Railway. The contract will also include the removal and rebuilding of part of the piers in masonry. Plans may be seen, and specification, detailed quantities, and form of tender obtained on personal application at the office of W. J. Cudworth, the company's engineer, at York. Sealed tenders marked "Tenders for the renewal of Tees bridge, Thornaby" must be sent to the secty. at York, before noon on July 24.

July 26. Rhondda.—*Steelwork* of a road bridge of 52ft. span and 40ft. in width, erected complete (to contractor's own design) at Llwynypia, Rhondda Valley, for the U.D.C. Designs and tenders must be received not later than July 26. Plans and sections of the abutments and site and all particulars may be obtained on application to W. Jones, engineer and surveyor, Council Offices, Pentre, Rhondda, on deposit of £1 1s.

August 7. Lancaster.—*Reconstructing and improving the steam-heating arrangements and hot-water service* of the County Lunatic Asylum. The committee is prepared to consider tenders from engineers or firms who are willing to make a survey, free of cost to the committee, and to report on what improvement they would propose to make in the present system. Further information, if required, may be obtained on application to the medical superintendent. Tenders will be received up to the morning of August 7.

Aug. 31. Rio de Janeiro.—*Supply of* 34 *metallic superstructures* for bridges on the Central Railway. A deposit of 5,000 milreis is required. For particulars apply to Intendencia da Estrado de Ferro Central do Brazil, Rio de Janeiro. Tenders to be sent in by Aug. 31.

Oct. 1. Bangkok (Siam).—*Construction of a bridge*, 260 metres long, over the Meram River. For particulars apply to the Siamese State Railways, Bangkok. Tenders to be in by Oct. 1.

Oct. 1. Siam.—*Iron bridge* across the Menam River, Siam, for the Royal Siamese State Railways. Drawings and conditions may be obtained for a payment of 10s. from W. A. Evans, acting financial agent, Siamese Legation, 23, Ashburn Place, S.W. Sealed tenders must be forwarded to L. Weiler, Director-General, Railway Department, Bangkok, Siam, in whose office they will be publicly opened on Oct. 1.

IRON AND STEEL.

July 5. Gravesend.—*Supply and fixing of about* 110 *yds. of wrought-iron fencing.* Plans and specification may be seen at the Borough Surveyor's Office, Town Hall, and tenders, marked "Tender for Iron Fencing," must reach H. H. Brown, town clerk, not later than July 5.

PAINTING AND PLUMBING.

July 6. Manchester.—*Painting various bridges* over the Bridgewater and Rochdale canals and the River Medlock. Specification and form of tender may be obtained on application at the City Surveyor's Office, Town Hall, Manchester, on payment to the City Treasurer of £1 1s. All cheques or postal orders are to be made payable to the order of the Corporation of Manchester. Tenders, enclosed in the official envelope and addressed to the Chairman of the Paving, &c., Committee, to be delivered at the City Surveyor's Office not later than 10 a.m. on July 6.

July 6. Monmouthshire.—*Painting and colouring* the undermentioned Council Schools:—Argoed, Blackwood, Troedrhiwgwair, Dukestown, Middle Rhymney Infants, New Tredegar Mixed, New Tredegar Infants', Cwmsyfiog. Specifications can be seen at the office of C. Dauncey, County Council Offices, Newport, Mon., to whom tenders must be delivered by July 6.

July 6. Warrington.—*Painting and cleaning* of certain schools. Specifications, forms of tender, and all further information may be obtained at the office of the Borough Surveyor, Town Hall, at which place tenders must be delivered before noon on July 6.

July 7. Hove.—*Distempering walls, ceilings, &c.*, at the Hove Sanatorium, Portslade. Further particulars may be obtained at the office of the borough surveyor, H. H. Scott, Town Hall, Hove. Tenders, on forms supplied, addressed to H. Endacott, town clerk, Hove, endorsed "Tender for Distempering, &c., Sanatorium," will be received up to 2 p.m. on July 7.

July 7. Mistley.—*Painting* and other work at the Police Station, Mistley, Essex. Specification can be seen at the Police Station upon application to the Inspector. Sealed tenders, endorsed "Tender for Painting, &c., Mistley Police Station," must reach F. Whitmore, county architect, 73, Duke Street, Chelmsford, not later than July 7.

July 7. Southminster.—*Painting* and other work at the Police Station, Southminster, Essex. Specification can be seen at the Police Station upon application to the Superintendent. Sealed tenders, endorsed "Tender for Painting, &c., Southminster Police Station," must reach Frank Whitmore, county architect, 73, Duke Street, Chelmsford, not later than July 7.

July 9. Liverpool.—*Washing*, preparing, whitewashing and colouring walls, ceilings, &c., painting, papering, &c., at the Royal Southern Hospital. Copies of the specification may be obtained on application to the Superintendent at the hospital. Tenders to be sent in on or before July 9, addressed to the Chairman of the Board of Economy.

July 10. London.—*Cleaning, repainting, &c.*, of Lea Bridge, Clapton, for the L.C.C. Persons desiring to submit tenders may obtain the specification, bills of quantities, form of tender and other particulars, on application to the chief engineer, Maurice FitzMaurice, C.M.G., at the County Hall, Spring Gardens, S.W., upon payment to the cashier of the Council of the sum of £1. Full particulars may be obtained on application at the County Hall previously to the payment of the fee for the specification, &c. Tenders must be upon the official forms, and the printed instructions contained therein must be strictly complied with. Fair wages clause. Each tender is to be delivered at the County Hall in a sealed cover, addressed to "The Clerk of the London County Council, Spring Gardens, S.W.," and marked "Tender for Painting, &c., Lea Bridge." No tender will be received after 10 a.m. on July 10.

July 10. Fleetwood.—*Painting, &c.*, the Fleetwood and Thornton Council Schools in accordance with specifications to be seen at the offices of J. H. Kean, district education clerk, 5, Victoria Street, Fleetwood. Separate tenders in respect to each school must reach the district clerk by noon on July 10.

July 10. Newcastle.—*Cleaning and painting* (two coats of paint and one of varnish) of Nos. 4, 8 and 10 wards, and all the corridors at the Union Hospital, Westgate Road; also alternative tenders for the doing of the same with paripan (two coats, one of body and one of finishing), the work to be completed by the end of August. Further particulars may be obtained on application to the Master at the Union Workhouse, Westgate Road. Tenders, endorsed "Tenders for Painting," must be sent to James Atkinson, clerk to the Guardians, 127, Pilgrim Street, Newcastle-upon-Tyne, not later than noon on July 10.

July 10. Leeds.—*Painting exterior* of temporary small-pox hospital at Killingbeck. Further particulars, specification, and form of tender may be obtained at the Town Clerk's Office, where tenders endorsed "Painting, City Hospitals," are to be delivered not later than July 10.

July 11. Southampton.—*Decorative repairs* and other work at Hartley University College, and the hostels at Bevois Mount House, Lodge Road, and Windsor House, Cumberland Place. Specifications and conditions can be seen at the offices of A. F. Gutteridge, architect and surveyor, 9 Portland Street, Southampton. Tenders endorsed "Tender for Decorative Repairs to College and Hostels," to be sent to D. Kiddle, registrar, Hartley University College, Southampton, not later than 10 a.m. on Wednesday, July 11.

July 11. London, S.W.—*Painting, distempering, general repairs, &c.*, at the Infirmary in the Fulham Road, S.W., and at the Children's Home in Millman's Street, Chelsea, S.W., for the Guardians of St. George's Union. Specifications and all particulars may be obtained from W. Ernest Hazell, A.R.I.B.A., No. 5, Tavistock Square, W.C., between 10 a.m. and 5 p.m. Tenders must be signed, sealed and endorsed "Tenders for Painting, &c., at St. George's Infirmary and Children's Home," and forwarded to Thomas Warlock, clerk to the Guardians, Saint George's (Hanover Square) Hall, Mount Street, W., not later than 11 a.m. on July 11.

July 13. Preston.—*Painting*, &c., public conveniences in various parts of the borough. Specification, form of tender and all other information may be obtained at the office of the Borough Surveyor, Town Hall, Preston, to whom sealed tenders, endorsed "Tender for Painting, &c., Conveniences," must be delivered not later than noon on July 13. Fair wages clause.

July 13. Preston.—*Painting*, &c., required throughout the Cattle Market, Brook Street. Specification, form of tender, and all other information may be obtained at the office of the Borough Surveyor, Town Hall, Preston, to whom sealed tenders, endorsed "Tender for Painting," &c., Cattle Market," must be delivered not later than noon on July 13. Fair wages clause.

July 14. Ilford.—*Cleaning and painting* the exterior of Downshall School, including the interior and exterior of the latrines and play-sheds, and also the boundary railings, during the summer vacation. Copies of the specification and forms of tender may be obtained at the offices of H. Shaw, A.M.I.C.E., engineer and surveyor, Town Hall, Ilford, during usual office hours, upon payment of £1 1s. Sealed tenders, on the proper forms supplied, together with the specification, endorsed "Tender for Painting Downshall School," and addressed to the Chairman of the Education Committee, to be delivered to W. S. Torbitt, secretary to the Committee, Education Offices, Cleveland Road, Ilford, not later than noon on July 14.

July 16. Dorchester.—*Painting, lime-washing and repairing* at the National Schools during the summer holidays. Particulars and forms of tender may be obtained at the Secretary's Office, where sealed tenders, marked "Tender for Repairs," should be delivered before 3 p.m. on July 16.

July 16. Ipswich.—*Painting and decorating work* to be done at all or any of the following Council schools during the August holidays:—Outside painting: London Road Girls' and Infants', St. Mary Elms Boys', Cavendish Street Boys', Nacton Road Mixed. Inside cleaning, colouring and whitewashing: Westerfield (including teachers' house), Whitton (including teachers' house), Trinity Street Girls' and Infants', Springfield Boys', Girls', and Infants' (excluding new classrooms). A copy of the specification and any further particulars may be obtained on application to E. T. Johns, Tower Chambers, Tower Street, Ipswich. The price for each school must be stated separately. Fair wages clause. Tenders, plainly endorsed "Tender for August Work," must be delivered to J. Hepburn Hume, secty., Education Committee's Offices, Tower House, Tower Street, Ipswich, between 10 and 12 noon on July 16.

No date. Wigan.—*Painting, colouring, &c.*, at the various elementary schools. Particulars may be obtained from John W. Horne, secretary to the Education Committee, Education Offices, King Street, Wigan.

ROADS AND CARTAGE.

July 5. Wellingborough.—*Supply of about* 2,000 *tons of granite*, to be delivered at the Midland Railway or London and North-Western Railway Stations at Wellingborough, for the U.D.C.:—Best lamp granite for breaking, about 1,000 tons (to be delivered at the rate of 40 to 60 tons weekly or as required); seconds lump granite for breaking, about 400 tons (to be delivered as above); best broken granite, 2¼ gauge, about 350 tons; seconds best broken granits, 2¼ gauge, about 200 tons; best granite chippings, ⅜in., without dust, 50 tons; Leicestershire 4in. by 4in. granite cubes. Tenders (on forms to be obtained from the Clerk), sealed and marked outside "Granite Tender," to be delivered to J. T. Parker, clerk to the Council, 29, Church Street, Wellingborough, by 5 p.m. on July 5. Samples to be delivered at the same time, carriage paid, at the Council's yard, Church Street.

July 10. Leeds.—*Paving and flagging* the following streets:—Hilton Road, Back Hares Mount, Seaforth Avenue, Seaforth Road, Back Trafford Avenue, Trafford Terrace, Strathmore Street, Strathmore View, Strathmore Avenue, Strathmore Terrace, Seaforth Place, Back Seaforth Place, Seaforth Terrace, Back Seaforth Terrace, Stott Road. Drawings may be seen at the City Engineer's Office, Municipal Buildings. Instructions to persons tendering, conditions of contract, specification, bills of quantities, form of tender and form of agreement may be obtained on application at the Highways Office, Kirkstall Road. Sealed tenders, endorsed "Tender for Private Street Works," and addressed to the Highways Committee, must be delivered at the Town Clerk's Office, Leeds, not later than 10 a.m. on July 10.

July 10. Romsey.—*Steam rolling and scarifying.* Conditions and specifications of the work can be obtained at the Borough Surveyor's Office in the Market Place, Romsey. Sealed tenders, marked "Rolling," must be delivered at the office of B. W. Attlee, town clerk, 2, Portersbridge Street, Romsey, before 5 p.m. on July 10.

July 11. London, W.C.—*Paving of Upper Bedford Place with tarred slag macadam*, agreeably with the specification prepared by the Borough Surveyor, which can be inspected at the Municipal Offices between 10 and 4. Tenders for the above work, which must be on forms to be obtained at the Holborn Municipal Offices, sealed and endorsed "Tender for Paving Upper Bedford Place," must be delivered at the Town Clerk's Office not later than noon on July 11, with the names, residences, and callings of two substantial persons as sureties in a bond of £1,000 for the due performance of the contract. The contract and bond will be prepared by the solicitor to the council, and the contractor will be required to pay the cost of stamping the same.

July 12. East Barnet.—*Supply of granite and gravel*, for the U.D.C., for one year ending Sept. 30, 1907:—Supply of broken granite for roadways; supply of gravel for roadways; supply of hoggin; horsing of water-vans, &c.; general cartage; cartage of granite, gravel, hoggin, &c. Further particulars and forms of tender can be obtained on application to Henry York, C.E., surveyor to the Council. Tenders, which must be on the forms supplied, must be sent in, addressed to the Chairman of the Council, not later than noon on July 12.

July 17. Rochester.—*Supply of road metal* for the period of twelve months ending June 24, 1907:—1,800 tons 2in. broken Quenast, Guernsey, or Aberdeen granite; 400 tons 1¼in. broken Cherbourg quartzite; 350 tons ¼in. granite chippings; 350 tons ⅜in. granite chippings; 500 tons 2¼in. broken Kentish ragstone; 150 cubic yds. Aylesford sand; 150 cubic yds. Aylesford gravel; 500 cubic yds. Thames ballast. Specification and form of tender can be obtained on application to William Banks, A.M.I.C.E., city surveyor, Rochester. Sealed tenders, endorsed "Tender for Road Metal," are to be delivered at the Town Clerk's Office before 4 p.m. on July 17.

July 19. Bristol.—*Roadmaking* at Parson Street, Bedminster. The plans and specifications may be inspected and form of tender obtained at the office of Peter Addie, at the Council House. Tenders, duly endorsed, must be delivered at the Office of the Education Committee, at the Guildhall, by noon on July 19.

No date. Wimborne.—*Steam rolling* the rural main roads of the county. Specification and form of tender and further particulars may be obtained from Walter J. Fletcher, County Surveyor's Office, Wimborne.

SANITARY.

July 6. Brighton.—*Supply of* 1,000 *tons of granite spalls.* The specification and form of tender may be obtained on application at the office of the Borough Surveyor at the Town Hall, Brighton. Sealed tenders, endorsed "Tender for Granite Spalls," must be left at the office of Hugo Talbot, town clerk, Town Hall, Brighton, before .0 a.m. on July 6.

July 7. Hemel Hempstead.—*Cleaning and repairs* at the following schools:—Queen Street, George Street, Two Waters, Apsley, St. John's Road and Cowper Road. Specifications may be seen at the office of Lovel Smeathman, clerk to the Committee, Education Offices, Town Hall, Hemel Hempstead, to whom tenders, marked "Tender for Repairs, &c., to Schools," should be delivered not later than July 7.

July 7. Glasgow.—*Construction of sewer No.* 1 (Contract No. 2), extending from a point in Paisley Road, south of Ibrox Station, to a point in Saint Andrew's Drive, west of Shields Road. Plans, specifications and working drawings may be seen and specifications and schedules of quantities and forms obtained on application to the City Engineer, at his office, City Chambers, 64, Cochrane Street, Glasgow, on payment of a fee of £5 5s. Sealed offers, marked outside "Tender for Sewer No. 1 (Contract No. 2)," must be lodged with A. W. Myles, town clerk, City Chambers, Glasgow, not later than July 7.

July 7. Horwich.—*Drain tiles* required for No. 11 bacteria beds, 69ft. in diameter, for the U.D.C. Plans may be seen and the necessary information obtained from the engineer, Mr. H. L. Hinnell, M.I.C.E., of 41, Corporation Street, Manchester. Sealed tenders, endorsed "Drain Tiles," together with samples of the tiles, to be delivered to Peter Taberner, clerk to the Council, Council Offices, Horwich, not later than July 7.

July 7. Horwich.—*No.* 11 *sprinklers, fittings, &c.*, for bacteria beds, 69ft. in diameter, required at their sewage-disposal works, for the U.D.C. Plans may be seen and full particulars and specification obtained at the office of the engineer, H. H. Hinnell, M.I.C.E., of 41, Corporation Street, Manchester, upon a deposit of £1. Sealed tenders, endorsed "Sprinklers," must be delivered to Peter Taberner, clerk to the Council, Council Offices, Horwich.

July 9. Sunderland.—*Construction of about* 227 *lineal yds. of* 24*in. cast iron pipe sewer outfall* and about 23 lineal yds. of 18in. fireclay pipe sewer, together with drop manhole, &c., across the foreshore and roadway at the end of Sea Lane. Drawings and specifications may be seen and form of tender and bills of quantities obtained at the Borough Surveyor's Office, Town Hall, on payment of £1 1s. Tenders, addressed "To the Chairman of the Health Committee," and endorsed "Tender for Sewer at end of Sea Lane," must be delivered at the office of Francis M. Bowey, town clerk, Sunderland, before noon n July 9.

July 11. London, W.C.—*Construction of new brick sewer* in John Street, Bedford Row, and other works in connection therewith, agreeably with the plan and specification prepared by the Borough Surveyor, which can be inspected at the Municipal Offices between 10 and 4. Tenders for the above work, which must be on forms to be obtained at the offices, sealed and endorsed "Tender for New Sewers," must be delivered at the Town Clerk's Office not later than noon on July 11, with the names, residences and callings of two substantial persons as sureties in a bond of £700 for the due performance of the contract. The contract and bond will be prepared by the Solicitor to the Council, and the contractor will be required to pay the cost of stamping the same.

July 12. Brighton.—*Supplying such glazed drain pipes* as may be required by the Corporation for the year ending July 31, 1907. The specification and form of tender may be obtained on application at the office of the Borough Surveyor at the Town Hall, Brighton. Sealed tenders, addressed to Hugo Talbot, town clerk, and endorsed "Tender for Supply of Drain Pipes," must be left at the Town Hall before 10 a.m. on July 12.

July 12. London, S.E.—*Construction of an under ground convenience* at Kennington Gate. Drawings can be seen and specification, bills of quantities and form of tender obtained at the offices of the borough engineer, Henry Edwards, C.E., 346, Kennington Road, S.E. between 10 a.m. and 12 noon and 2 p.m. and 4 p.m. (Saturdays excepted), on payment of £1 1s. Tenders, duly made on the prescribed form, must be delivered at the Town Hall, Kennington Green, S.E., not later than noon on July 12.

July 17. Basford.—*Construction of sewerage and sewage-disposal works* for the parish of Brinsley, Nottinghamshire, for the R.D.C. The contract comprises 3½ miles of stoneware pipe sewers (chiefly 9in.), with manholes, flushing chambers, and other appurtenant work, construction of screening chambers, sewage tanks, bacterial filter beds, effluent drains, &c. The drawings may be seen at the office of S. Maylan, engineer and surveyor to the Council, and copies of the specification, conditions, bill of quantities and form of tender may be obtained on deposit of a cheque for £2 2s. Sealed and endorsed tenders to be delivered to C. J. Spencer, clerk to the Council, Public Offices, Nottingham Road, Basford, Nottingham, on or before 9 a.m. on July 17.

July 20. Pontefract.—*Sewerage and sewerage-disposal works* for the R.D.C. Contract No. 1:—For the several works and materials required in the construction of 720 yds. or thereabouts of earthenware and cast-iron pipe sewers, 9in. diameter, with the necessary valves, manholes, &c.; also for the several works to be constructed on the outfall field, comprising tanks, levelling of land, distributing carriers, manholes and road to works, with all necessary valves, &c., at New Fryston, in the county of York. Plans and specifications may be seen and bills of quantittes and forms of tender obtained at the offices of the Council's engineer, John Waugh, C.E., Sunbridge Chambers, Bradford, on payment of £4 4s. Tenders must be upon official forms, and the official instructions contained therein must be strictly complied with. Tenders, under cover, endorsed "Tender for New Fryston Sewerage, Contract No. 1," must be sent to J. Dickson Smith, clerk, addressed Union Offices, Pontefract, Yorkshire, on or before noon on July 20.

TIMBER.

July 15. Cairo.—*Supply of* 2,000 *6-metre crossing sleepers* for the Egyptian State Railways Administration n accordance with the specification and general conditions, copy of which may be seen at the offices of the Commercial Intelligence Branch, 73, Basinghall Street, London, E.C. Tenders, accompanied by a stamped paper of 30 millèmes and addressed "Monsieur le Directeur Général des Chemins de fer de L'Etat, Cairo," will be received in Cairo up to July 15. Copies of the specification and form of tender may be obtained from Lieut.-Colonel Western, R.E., C.M.G., Queen Anne's Chambers, Broadway, Westminster, London, S.W., on payment of 2s. each copy.

MISCELLANEOUS.

July 5. Carmarthen.—*For the following works*, for the Education Committee:—Ventilation, Capel Evan Council School; ventilation and dadoes, Cwmbach Council School; repairs to conveniences, Llansadwrn Council School; ventilation and repairs to Cefnarthen Council School; alterations to conveniences, White Mill Council School; alterations to conveniences, Clawddowen Council School; repairs to St. Clears Council School; repairs to Ammanford Council School; painting and colouring Capel Isaac Council School; painting and colouring Llwynhendy Council School; painting and colouring Philadelphia Council School; painting and colouring Bynea Council School. Specifications may be seen and full particulars obtained on application at the above-mentioned schools, or at the office of W. D. Jenkins, M.S.A., M.R.S.I., county education architect, Shire Hall, Carmarthen. Tenders, sealed and endorsed, to be delivered separately to J. W. Nicholas, County Education Offices, Carmarthen, on or before July 5.

July 9. Doddington.—*Erection of a new water-tank* at the Workhouse, Doddington, near March, Cambridgeshire. Plans and specification may be seen at the Board-room, Union Workhouse, Doddington, on any day, Sunday excepted, between 10 a.m. and 4 p.m. Sealed tenders, duly endorsed, must be delivered to George Sharman, clerk, Broad Street, March, free of expense, not later than 4 p.m. on July 9. No official tender form will be issued.

July 10. London, W.C.—*Making, testing and delivering* of 42in. and other sluice valves, &c., for the Metropolitan Water Board. Forms of tender and contract, with specification, may be obtained and the drawings inspected upon application to the Engineer at The Firs, Southern Road, Fortis Green, East Finchley, between 10 and 4 (except on Saturdays). Tenders, enclosed in sealed envelopes, addressed to the Clerk of the Board, Metropolitan Water Board, Savoy Court, Strand, W.C., and endorsed "Tender for Sluice Valves, &c., Fortis Green Reservoirs," must be delivered at the offices of the Board not later than 10 a.m. on July 10.

July 11. London, W.C.—*Providing, laying and fixing* of about 3,500 lin. yds. of water-mains ranging from 4ins. to 7ins. in diameter, and for the construction and equipment of six meter stations, and various works connected therewith, for the Metropolitan Water Board. Instructions for tender and form of tender, with form of contract and schedules annexed, can be obtained and the drawings inspected at the office of Sir A. Binnie & Sons, 9, Great George Street, Westminster, on payment of £1. Tenders, enclosed in a sealed cover and addressed in the manner provided in the instructions for tender, must be received at the office of Sir A. Binnie & Sons, 9, Great George Street, Westminster, not later than 10 a.m. on July 11.

July 17. London, S.W.—*Supply of* 700 *brass boiler tubes and* 1,000 *steel tyres*, for the Southern Mahratta Railway Co., as per specifications and drawings, which may be seen at the offices of the Company, 46, Queen Anne's Gate, S.W. The charge for specification No. 1 is 10s. 6d. and for No. 2, £1 1s., which will not be returned. Tenders must be sent in addressed to the Secretary, marked "Tender for Boiler Tubes," or as the case may be, not later than noon on July 17.

July 26. London, N.E.—*For the supply of the following stores*:—Specification No. 27: Section A, arc lamp pillars; section B, erection of arc lamp pillars and switch pillars: section C, arc lamps and accessories; section D, switch pillars. General conditions, specification, drawings, form of tender, and form of agreement may be inspected at the offices of Robert Hammond, M.I.C.E., the consulting engineer to the Hackney Council, 64, Victoria Street, Westminster, S.W., and may be obtained on making a deposit of £5. Extra copies of the specification may be obtained by *bona-fide* tenderers at a charge of 5s. per copy, which sum will not be refunded. Tenders (sealed and marked "Tender for Arc Lighting Apparatus") must be addressed to W. A. Williams, town clerk, at the Town Hall, Hackney, and be delivered on or before 4 p.m. on July 26. Fair wages clause.

August 3. London, S.W.—*Supply of* 336 *dozen files*, for the Egyptian War Department. Tender forms may be obtained from Lieut.-Colonel J. H. Western, R.E., C.M.G., Queen Anne's Chambers, Westminster, London, S.W., and are returnable to him by August 3. Tenders must hold good for twenty-five days from that date.

No date. Alexandria.—*Quotations required for the following stores*, for the Sudan Government Railways:—Corrugated galvanized iron sheets, per ton, 20 gauge, in sheets, 6ft., 10ft., 11ft. and 12ft. lengths, with necessary screws and washers; Hall's sanitary distemper, per cwt., cards having colours stocked in Egypt to be enclosed; Keen's cement, per ton; plaster-of-Paris, per ton; red oxide paint ground in oil, per ton; rim locks; casement stays, brass or iron; "cock-spurs," in brass or japanned iron; thumb latches, in brass and iron; bolts for French windows; tower bolts; butt hinges; japanned iron "T" hinges; japanned iron or stamped steel brackets for shelves. For particulars apply the Agent, Sudan Government Railways, 4, Cleopatra Street, Alexandria.

New Companies.

Wolverhampton Patent Stone Co., 45, Queen Street. Capital: £1,000.

George Grimwood & Sons, to take over the business of a builder and contractor carried on by F. J. Grimwood at Ipswich. Capital: £10,000.

Birmingham and Midland Counties Val De Travers Paving Co., to take over the business of a company of the same name, now in liquidation. Capital: £25,000.

Corn Brothers, to acquire the business of tile manufacturers carried on by R. A. Corn & F. C. Newbrook at Tunstall and Longport, Staffs, as Corn Brothers. Capital: £10,500.

Castle Limestone Quarry Co., to take over the business of quarry owners carried on by T. W. P. Storey and S. Sutcliffe, at Dyserth, Flint, as the Castle Limestone Quarry Co. Capital: £4,000.

John Waddicor & Co., to adopt an agreement with J. Waddicor, and to carry on the business of varnish manufacturers, oil merchants, &c., at Edgworth, near Bolton. Capital: £2,000.

Uxbridge Road Brick Co., to acquire and turn to account certain land with brickmaking plant at Southall, and to adopt an agreement with W. H. S. Reed. Capital: £5,000.

West of England Road Metal Co., to acquire the business carried on by H. Gill, J. C. Annear, B. Annear, Laura Chubb, G. Thomas, J. Gill, and R. Rogers as the Gabro Stone Co. Capital: £10,000.

Burslem and Tunstall Fireclay Co., to acquire certain lands at Huntilee and Scotia, near Tunstall, and to adopt an agreement with Sarah E. Watkin and E. T. Watkin. Capital: £3,000.

European Marble and Granite Co., to take over the business of dealers in marble, granite and similar commodities carried on at Johannesburg, Durban, Port Elizabeth and Cape Town, as W. R. Jecks & Co.

Saxon Brothers & Co., to acquire the business of joiners, builders, contractors, &c., carried on by S. D. Saxon and O. Andrews at Stalybridge, as Saxon Brothers. Capital: £4,000.

W. E. Russell & Co., to take over the business of a builder, contractor, plumber and electrical engineer carried on by W. E. Russell at Wood Street, St. Anne's-on-Sea, and at the Market Hall, Lytham, Lancashire. Capital: £1,000.

Carter and Banks, to take over the business of tile and mosaic manufacturers and builders' merchants carried on by A. W. Carter and C. W. A. Banks at 283, Brockley Road and St. Margaret's Road, Brockley, S E. Capital: £1,500.

Hill Top Colliery, Brick and Tile Co., to acquire certain mines at or near Newthorpe, Nottingham, to adopt an arrangement with T. W. S. Jones, and to carry on the business of colliery proprietors, brick and tile manufacturers and dealers, &c. Capital: £60,000.

National Construction Co., Ltd., to acquire and turn to account any contracts, rights, grants, concessions, &c., relating to land, railways, tramways, roadways, waterways, British and Colonial Government contracts, electrical generation, traction and supply, buildings, harbours, docks, naval and military works, canals, timber, transportation, lighting, &c., in any part of the British Empire. Capital: £60,000.

A new Church has been built at Abbotsbury, Highweek, near Plymouth, from designs by Mr. Edmund Sedding. It occupies the site where Abbotsbury House once stood. The main walls are of Stoneycombe limestone, retaining its rock face. Delabole slate is used for the roof. The length of the nave and north and south aisles is 96ft. 6ins. and the width 59ft. 9ins.; the chancel measures 35ft. by 31ft. Glass screens at the west end divide the main entrances. The contractors were Messrs. Hugh Mills & Sons.

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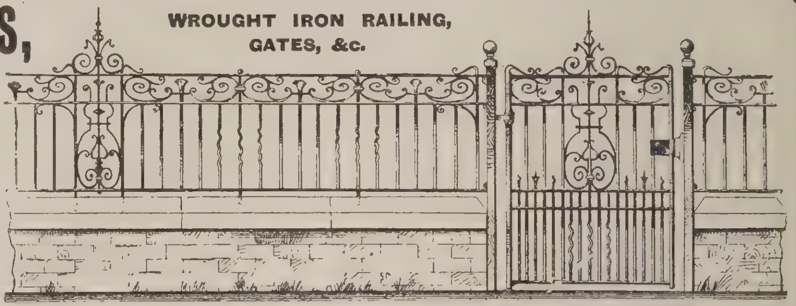

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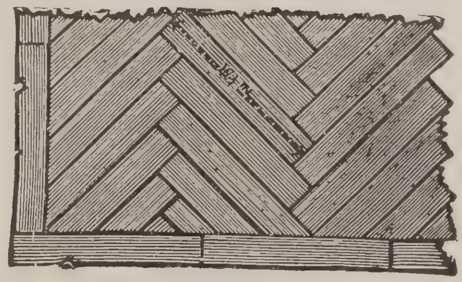

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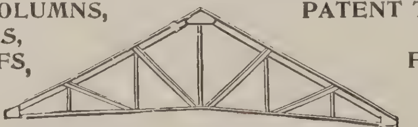

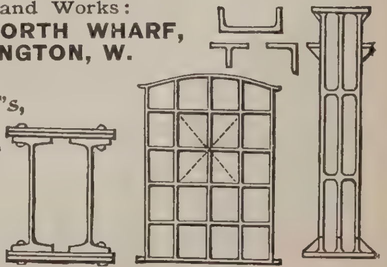

THE BUILDERS' JOURNAL
AND ARCHITECTURAL ENGINEER.

July 4th, 1906.

FIRE SUPPLEMENT (MONTHLY).

MILAN FIRE CONGRESS.

WE have referred to the International Fire Service Congress of Milan in our previous issue, as we were able to obtain some particulars just before going to press.

The conference was, however, of such an important character that we must add further particulars. In the first place this conference was organized under the auspices of the International Fire Service Council, and at the invitation of the Italian Government and the Italian Fire Service Association. It had for its patron the King of Italy, and was opened on the King's behalf by H.R.H. the Prince of Turin. It had for its president and vice-presidents the Ministers of State, whose departments are interested in matters of fire-protection, and it had among its Congress members men of such eminence as Monsieur Lepine, the great Paris Police Chief, whilst practically everybody was present who could speak authoritatively on fire service and fire-preventive matters.

It is, however, curious to observe how gradually these conferences give greater attention to fire-preventive questions, and we find for instance that of nine resolutions passed, no less than four specifically dealt with questions of building construction, as against two which referred to fire-brigade questions proper and three that referred to general questions of fire protective organization. The architectural and engineering element is very much on the increase in the ield of fire-protection, and the modern fire-brigade officer seems to be generally either an architect, a surveyor, a civil engineer or a royal engineer by profession. The work of the modern fire-brigade officer is turning more and more in the direction of the supervision of buildings from the fire-preventive point of view, including a primary examination of plans and the inspection of the mechanical equipment. A thorough knowedge of building and building construction eems to be required, also a knowledge of electricity, mechanical engineering, and other echnical specialities.

On the other hand, architects and surveyors are practically being compelled to ake a greater interest in matters of fire-proection than heretofore, and upon approachng the subject of fire-resisting materials ind, as a rule, that the first thing they must do is to try and get rid of theoretical preconceived notions and to realize the latest esults of investigation with materials and he conditions of fire due to the highly nflammable nature and bulk of goods nowadays stacked in buildings. In other words, he teaching of ten years ago has to be nlearnt by the architect and engineer of to-day if he wishes to keep pace with modern evelopments in fire-resisting construction, nd there is no place where the ordinary ractitioner can more rapidly realize how ittle his older teachings apply than by ssociating with the specialist architect, the modern fire chief, and the modern fire-insurance surveyor whom he meets at conferences, such as the Milan Fire Congress.

The first step towards bringing together those interested in building construction, fire service and fire-insurance requirements was attained in 1903 by the British Fire-Prevention Committee when they convened the first Fire Prevention Congress as distinct from the Fire Service Congress. Since that date, both at Buda Pesth and at Milan, the fire congresses of old have practically become Fire Prevention Congresses.

Some of the principal papers at Milan dealt with the protection of windows, with questions appertaining to reinforced concrete, with means of escape from public buildings, with motor garages and other structural problems; and had it not been for two very good papers by the chief of the Vienna Fire Brigade and the chief of the Berlin Fire Brigade, both regarding motor fire appliances, the consideration of the constructional questions would have predominated to too great an extent.

We have published in one of our previous issues the paper by Mr. Ellis Marsland, district surveyor for Camberwell. In the current issue we give the paper by Mr. Percy Collins, F.S.S., on motor garages, one of the latest constructive problems.

In due course we shall present other papers.

In the meantime we would give publicity to some of the resolutions passed at this Congress that have reference to building construction, and we should at once mention that the resolution on reinforced concrete is probably one that will have the most far-reaching effect. How great the interest was in questions of reinforced concrete may be gathered from the fact that the paper read by Mr. James Sheppard, surveyor to the North British Insurance Co., was the best attended paper at the Congress, and probably the best received.

The resolutions are as follows:—

THE RESOLUTIONS.

Resolution I.—External openings to Buildings.

That the Congress considers—

(*a*) That greater attention be accorded to the protection of vertical external openings to buildings than heretofore.

(*b*) That some approved means of protection be compulsory for all opposite windows having less than 8ft. intervening, and for opposite windows in enclosed courts having less than 15ft. intervening.

Resolution II.—Public Buildings.

That the Congress considers that it is necessary to accord greater attention than heretofore to safety from fire in large public buildings, such as churches, museums, hospitals, colleges, &c.

Resolution III.—Reinforced Concrete.

(*a*) That the Congress considers that no reinforced concrete construction should be permissible in buildings intended to be fire-resisting unless the aggregate be most carefully selected and applied in such a manner as to give substantial protection to all metal parts.

That it is advisable where reinforced concrete is intended to be fire-resisting that every portion of the metal rods or bars contained therein be covered by not less that 2ins. of concrete, the aggregate of which must be able to pass through a sieve of not more than 1in. diameter, and that Portland cement of great fineness only be used.

(*b*) That where feasible all external angles should be rounded.

(*c*) Any angle iron needed for mechanical protection should be held in position independently of the concrete.

Resolution IV.—Motor Garages.

That the Congress considers—

(*a*) That the accommodation for motor-cars (motor garages) should not be allowed under dwellings.

(*b*) That special measures for isolating motor garages from adjacent dwellings be adopted.

(*c*) That special measures be taken to avoid the possible access of benzine or petrol into the cellarage, drains or sewerage system of buildings.

(*d*) That for the storage of small quantities of petrol or benzine the cans should be kept below ground level, but where a greater quantity be kept than can be easily removed by hand a proper underground metal receptacle should be employed from which the liquid could be extracted without the pressure of air.

Resolution V.—International relations and the International Fire Service Council.

That the Congress considers the primary object of the International Fire Service Council to be:—

I.—The encouragement of international social relations:—

(*a*) With the arrangements of facilities for written intercourse between the leaders of the fire-fighting and fire-preventing services of all countries.

(*b*) With the arrangements of the exchange of visits between fire-brigade officers and men of different countries.

II.—The organization of internal congress and congresses and conferences on important technical fire-preventive and fire-service subjects at given intervals:—

(*a*) With the arrangement of a proper sequence of the subjects to be considered without repetition.

(*b*) With the arrangement of their discussion by leading authorities.

(*c*) With their publication on uniform lines in three languages.

III.—The maintenance of a well managed enquiry office:—

(*a*) At which particulars as to sources of information can be easily and rapidly obtained.

(*b*) Technical questions can be replied to with authority

(*c*) Statistical and general information is issued at regular intervals.

Resolution VI.—International Statistics.

(*a*) That the Congress considers that reliable international statistical information as to fires and fire losses is essential.

(*b*) That the Congress hereby requests the International Council to prepare international statistics as to fires, obtaining the necessary data wherever possible from the respective Government departments or other authorities and societies concerned.

SOME DANGERS OF THE MOTOR CAR INDUSTRY.*

By **Percy Collins, F.S.S.**

I INTEND to confine my remarks to risks attending the manufacture and stabling of petrol-driven motor cars. I am not going to treat with cars driven by electricity, except in so far as any remarks which I may make with regard to manufacture generally may be applied, because that subject would have to deal with the dangers of electricity, and that is one which principally concerns an electrical expert.

By the term "motor cars" I mean vehicles of any description whose motive power is petrol, and by the term "petrol" I mean any product of like nature used as a motive power.

Converted Buildings and Factories.

Owing to the popularity which motor-propelled vehicles have now gained with the general public of all countries, motor car industries are cropping up in very many places, and consequently buildings which were designed and built for other manufacturing and business purposes are now being frequently converted into motor car factories and garages. In my opinion there is always a certain additional risk of danger to life when manufacturing premises are converted to a process of manufacture other than that for which they were originally built, and therefore, when so altered, special preventive measures should be adopted accordingly. To take one example. The various metal parts forming the chassis are made in different shops and are then brought to the assembling or chassis shop to be put together before the body is placed in position to complete the car. Proper lifting or running gear should be provided and free passageway maintained between these different departments. The work should be so arranged that the manufacture of the different parts and the assembling and fixing of them should, so to speak, proceed automatically in such a way that the raw material should come in at one end and be delivered in its manufactured state at the other, a system which I maintain lessens the risk of life as well as the risk of fire and consequent danger of life. Of course all the machinery should be properly fenced and guarded, a rule which applies alike to all manufacturing premises. These are, however, dangers which apply not only to the manufacture of motor cars but to manufacturing risks generally, and are points which should be borne in mind by all manufacturers having any concern for the safety of their employees. Again, a building converted to the use of a garage should, where necessary, be so altered and to such a specification that ensures the minimum risk of danger to life through fire as well as through other causes.

Petrol.

Now the special danger in motor car risks is the use of petrol, and the dangers of petrol are twofold. They are fire and asphyxiation. Therefore the points to be specially considered are how to minimize the risk of fire and the way to guard against asphyxiation.

What is petrol? Petrol is the first product obtained through the refining of crude petroleum; it is the most volatile portion of it. It has a very low flash-point indeed, and consequently requires even more than usual careful handling. I asked a petroleum refiner what was the flash-point of petrol, and his reply was, "There is no limit, it will flash at anything." Although not exactly correct, this reply was a characteristic one, and shows the absolute necessity of providing preventive measures against fire. Adequate arrangements also must be made for the vapour to escape into the open air.

There are only two departments in a factory where it is essential to have any petrol. They are the motor-testing shop and the petrol store. But generally there is some petrol as well in the reservoirs of the cars in the running shed or garage and the repair shop.

Testing Motors.

With regard to the testing of motors, this should always be carried on in a separate building entirely distinct and cut off or detached from the main works. The process of motor-testing is as follows:—After the various portions of the motor itself have been manufactured and put together it is tested (that is, it is set running) to ascertain that it is in order and running properly before being fitted into the chassis. This building should be built of fire-resisting material and should be well-ventilated top and bottom. The floor should be of concrete, and, if possible, sloping to an outside wall, and it should be drained so that any liquid should run out at the lower side of the floor, but preferably not into any system of main drainage. The motors during the process of testing should be placed on metal supports or brackets. The supply tanks containing the petrol (which, however, should not hold more than is sufficient for one day's consumption) should preferably be placed outside the building, the petrol being supplied to the motors by gravitation through metal pipes along a duct in the floor, and these pipes should be connected direct to the motors. If, however, these supply tanks cannot be so arranged outside and must be inside the building, they should be filled each morning out in the open, but should still be connected with the motors by metal piping. This building again should have no artificial heat, and should be artificially lit only by electric light, the conductors being enclosed in metal tubing, and the cut-outs and switches placed outside the building. Incandescent electric lights are preferable, but an approved type of arc lamp with double globes could be used. The duct referred to in the floor could be used also for the water pipes, water of course being necessary to keep the motor cool. A good plan is to have a water tank on the roof, and have a connection from it to supply a hydrant in the building. A good supply of buckets of sand and wet blankets should be kept in convenient places for instant use in the event of fire. Means should also be provided to immediately cut off the supply of petrol into the building in a like event when the reservoirs are fitted outside, as I have suggested.

The Petrol Store.

The petrol store should be detached and right away from any other building, and should also be built entirely of non-combustible material, having neither artificial light nor heat. The floor should be of concrete, and sunk to such a depth that it would contain below the ground level all the petrol that is likely to be in the store. Bulk should be broken in the store only, and the necessary supply for the motor-testing shop and reservoirs in the cars should be carried to its destination in metal cans to the open.

Lighting.

In the repair shop and garage, which should be separate buildings and distinct from the remainder of the works, there is generally, as I have said, petrol in the reservoirs of the cars, and for this reason these buildings should be lit by electric light. Any lights necessary to see to work underneath the cars should be portable electric lights. Oil lamps should never be used in buildings of this description. The reservoirs of the cars should never under any circumstances whatever be opened inside any building. Both operations of drawing off or filling should be carried on in the open. As strangers are admitted into these buildings, extra strict precautions should be observed against smoking. Of course, a good supply of usual fire-extinguishing appliances and buckets of sand should always be provided.

The other portions of a motor-car factory are similar to many other classes of manufactories. There are the metal machine shops, the sawmill, the body-making, paint and upholstering shops. These, however, do not call for any special remarks in this paper.

Petrol should be kept in Cans.

As I have said, petrol should be confined to the petrol store and motor testing shop, and in the repair shop and garage, but only when in the reservoirs of the cars. I have come across motor factories where, so as to thoroughly clean the different metal parts of the motor before fixing them together, they have been washed in open petrol baths inside the buildings, and these buildings have been lit by incandescent gas. An accident did not occur, but that was I am convinced only by a wonderful intervention of Providence. Needless to say that when this process has to be carried on it should be done outside in the open air.

Again, I have come across a factory where the machinery in the sawmill and car body building shop was driven by a petrol motor, the motor as well as the reservoir containing the supply of petrol for it, being in the same building, the reservoir being filled by hand from a can inside during working hours. This shop was also lit by gas. The same Providence in this case seemed to have a kindly eye also.

So much for factories.

Garages and Petrols.

Now with regard to garages and stables. Care should be taken here also never to open the petrol-reservoir of the car inside a building, but again this operation should always be carried on in the open. The garage itself—that is, the building in which the cars are stabled—should be built of non-combustible material, and should always be well ventilated top and bottom, and it is as well to have the roof ridged and open underneath at two sides so as to get a thorough draught of air continually through. Ventilation should always be provided for at the bottom as well as the top of the building, and, in fact, it is preferable to have one side of the building quite open. The repair shop, which is a necessary portion of all large garages, should be a separate and distinct building. The petrol store should be below ground, in the open, away from any buildings, and the reservoirs of the cars should be emptied into this store before the cars go into the garage. When next required they should be brought alongside the store in the open and refilled. This is advisable from another point of view, *i.e.*, to test the daily consumption of petrol in each motor. (There is always enough vapour left in the reservoir to take the car in and out of the garage.) When carbide lamps are used the store for the carbide of calcium should be built of non-combustible material and very good ventilation provided. Care should be taken to stop any damp coming into this store. The lamps should be filled in the open only, and both this operation of filling the lamps and the store itself should be kept well away from any other buildings or from the cars.

In ordinary stables the necessary small supply of petrol and carbide of calcium should be kept in the stable yard, the farthest possible away from any buildings.

A Fire in a Garage.

I have in mind one fire that occurred in a large garage. This garage was open on two sides and the roof was of iron and glass. An omnibus was brought into the garage after its day's run, and the chauffeur was drawing off what was left of the petrol. For the purpose of light he placed an oil lamp at least 12ft. away from the omnibus. It was but a very short time indeed after he opened the reservoir of the car that the vapour travelling towards the lamp caught fire, and, of course, instantly the flames ran back to the omnibus which was soon well alight. The chauffeur himself was injured, and it was only by extreme presence of mind on the part of another man, that the fire was extinguished and damage confined to this particular vehicle. The roof, however, was severely damaged and the skylights badly cracked. Had the fire not been dealt with so promptly, and had the garage been crowded, which was not the case at the time, a quantity of the glass roof would undoubtedly have fallen, and serious injury might have resulted from that and other causes.

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* A paper read before the International Fire Congress at Milan, 1906.

Another Example.

Another case in my personal knowledge was that of a small narrow brick built stable, which just admitted one car and there was barely room for the chauffeur to pass round The car was in the stable, its bonnet facing the doors, which were shut. The chauffeur was at the back of the car doing some small repair and had an oil lamp. There happened to be a leakage of petrol vapour, and very soon the front of the car was in flames. The chauffeur was almost in a death trap, but he had the presence of mind to put his back against the back wall of the stable, and push the car forward with all his might. This had the effect of forcing open the doors of the stable, and he was then able to push the car out into the open and get out himself.

These are two of the accidents which have occurred within my own knowledge, but they are only typical of many more that have happened and will unfortunately happen in the future through carelessness.

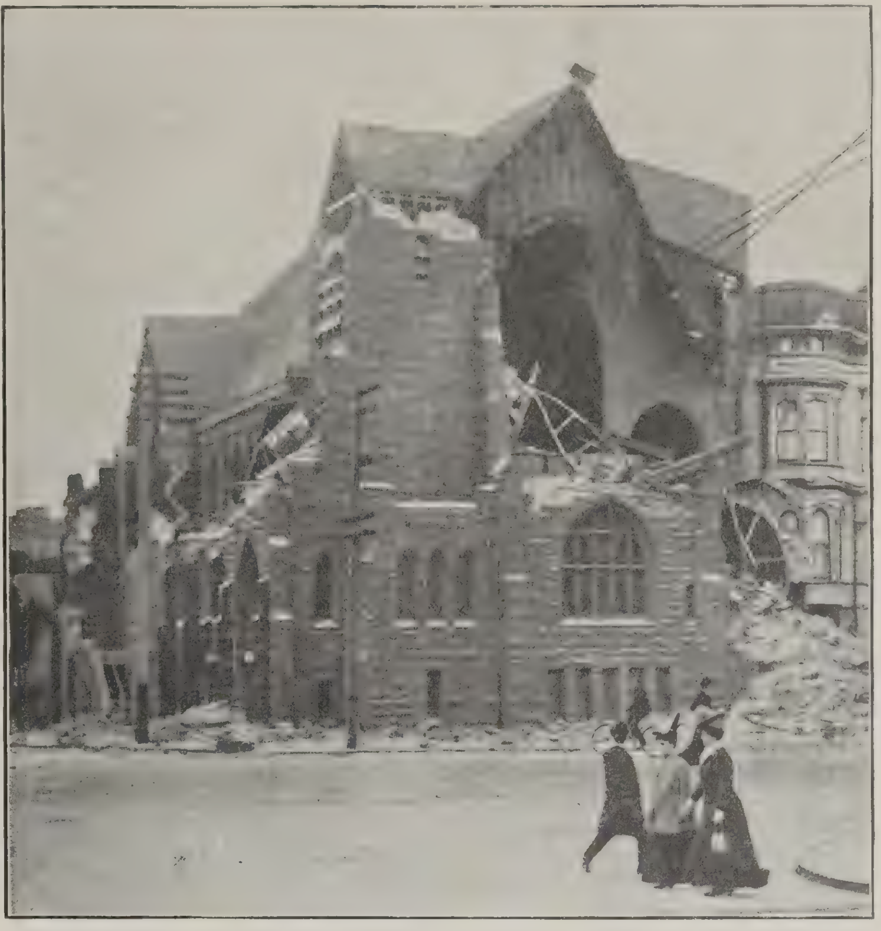


FIG. 1.—ST. LUKE'S EPISCOPAL CHURCH, VAN NESS AVENUE, SAN FRANCISCO.

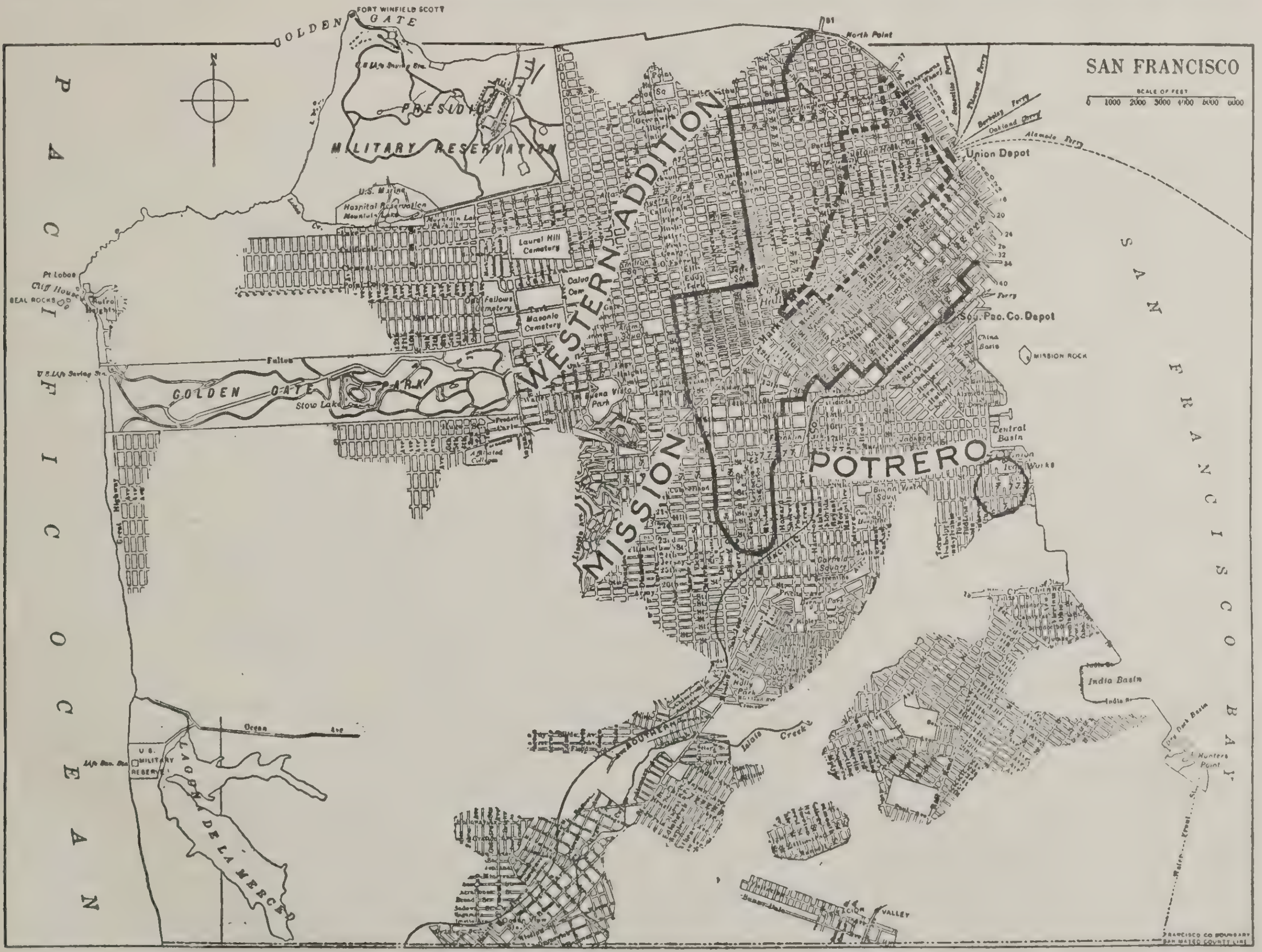


FIG. 2.—GENERAL MAP OF SAN FRANCISCO AND VICINITY.

The solid heavy line indicates the approximate boundaries of the area burned by the conflagration of April 18th, 1906. The broken heavy line shows the portion of the burned area that was composed of brick buildings, or superior structures; practically all the buildings outside of the broken line were of wood.

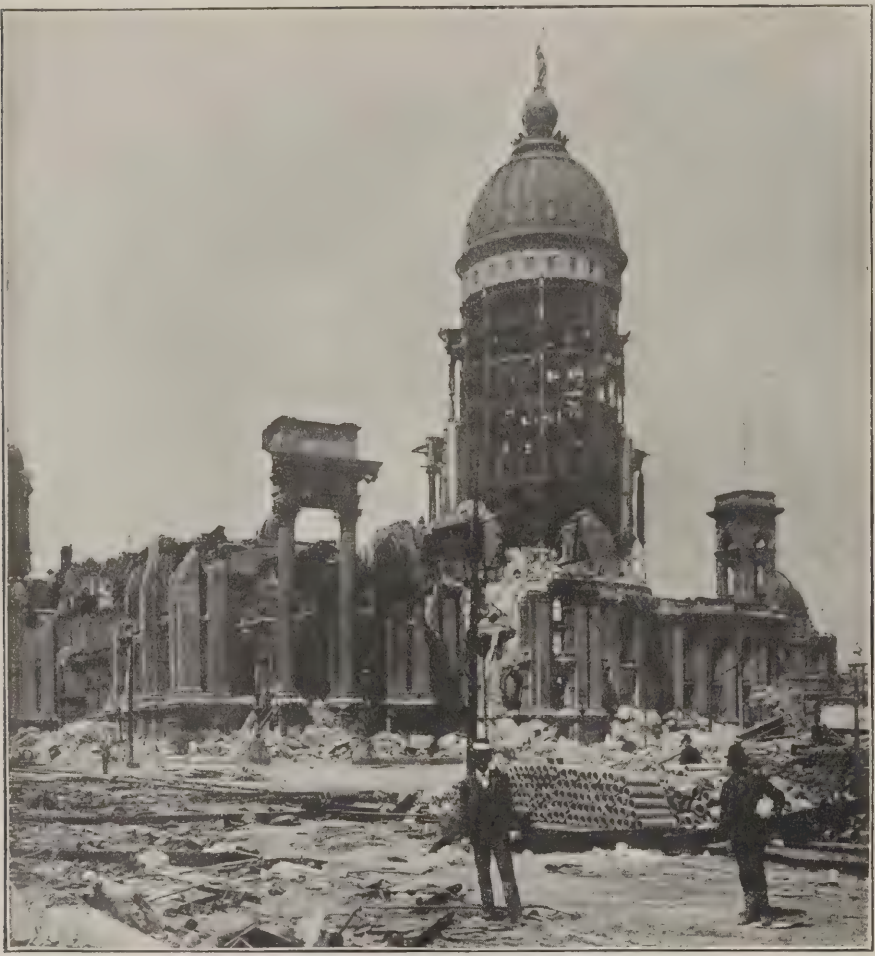


Photo: White Co.

FIG. 3.—CITY HALL, SAN FRANCISCO, AS WRECKED BY EARTHQUAKE: FRONTAGE TO MARKET STREET, SHOWING DOME SUSTAINED BY SKELETON CONSTRUCTION.

THE SAN FRANCISCO CONFLAGRATION.

IMMEDIATELY after the conflagration at San Francisco we published in our issue of May 9th details as to the general fire hazard of this city, as also a general view of San Francisco before the fire and a detailed plan.

Two months have elapsed since these particulars were presented, and one would have thought it possible by this time to have put before our readers reliable information as to what actually occurred and how the various materials and systems of construction behaved on this occasion. We are, however, only able to do this at present in quite general terms, for owing to the havoc wrought at San Francisco and the general upset of all business and correspondence arrangements, it is extremely difficult to obtain useful information at all, and such information as reaches us is, we regret to say, for the most part of an *ex-parte* character, transmitted by the various constructional firms interested in describing their works as having resisted fire in the most glowing language.

Fake Photographs.

Some of these *ex parte* particulars that reach us are accompanied by photographs, but even these photographs do not tell a true tale, for as we have been warned by several correspondents it has become the unfortunate practice of various specialist firms in America to prepare what would be commonly termed "faked" photographs, and we have actually cases in mind where buildings in outlying suburbs, scarcely affected by the fire, or at the most merely scorched, have been particularly prepared for the purposes of photography with a fine collection of débris specially arranged at suitable points, the copies of such photographs afterwards being used for trade purposes. The example for this kind of thing was probably started after the Baltimore conflagration, when the energetic salesmen of a well known local firm simply took the photograph of a building that had practically been entirely destroyed by fire with the exception of its back wall, placing his camera so that only this one back wall could be seen.

Concrete and Reinforced Concrete.

But we have received sufficient general data to be able to state quite definitely that concrete in floors and concrete as a protection to steel frame has withstood extraordinarily well both the action of the earthquake shock and the fire. Further, that the few examples of reinforced concrete construction in the form of floors made a most perfect showing, and that, speaking in general terms, concrete and reinforced concrete have proved themselves so efficient under the very trying circumstances of the San Francisco catastrophe that it may be safely assumed that concrete and reinforced concrete will be the order of the day for a great deal of the rebuilding of this great Californian centre.

It is unfortunate that there was apparently not a single entire reinforced concrete building in the San Francisco fire area, but one or two buildings of reinforced concrete frame construction, with brick external walls, were in course of erection, and these made a good showing. It is also regrettable that as far as these reinforced concrete examples were concerned there was no instance where they were actually subjected to any great severity of fire.

Thus, San Francisco does not afford that example we had hoped for of a reinforced concrete building successfully withstanding actual conflagration conditions any more than this was the case at Baltimore.

Months will probably elapse until we can present useful technical details as to the lessons to be learnt from the San Francisco fire. We must await the official reports—the reports of the fire underwriters and also the reports of the technical institutions.

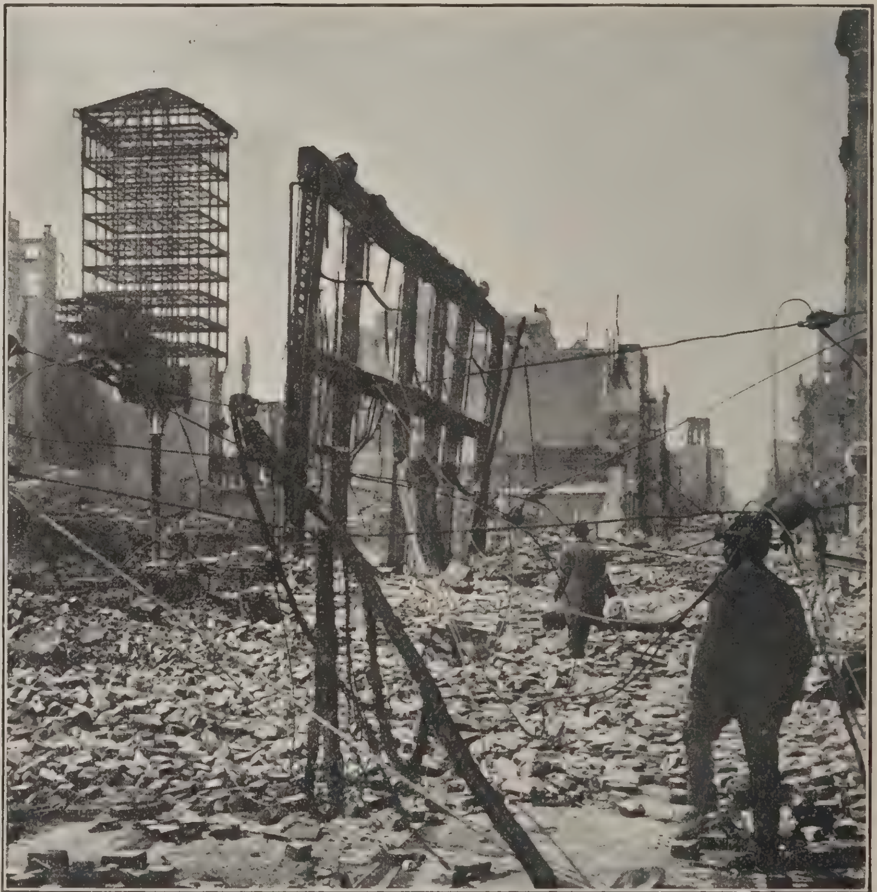


Photo: White Co.

FIG. 4.—POST STREET SAN FRANCISCO, ONCE A BUSY SHOPPING CENTRE.

But apart from the success of concrete and reinforced concrete, there can also be no doubt that a well-framed steel building having its steelwork properly protected by brick or porous terra-cotta embedded in Portland cement makes a good fire-stop, which is, however, also the case with a really substantially built structure on the older and more expensive lines of the monumental works of earlier days, where solid wall construction and brick arched flooring have been used.

Our Illustrations.

In the current issue we show a plan indicating the extent of the area affected by the fire, also a small general view. Next we show the following:—Fig. 1, St. Luke's Church, Van Ness Avenue (this shows the effect of the earthquake shock on a stone structure; the church was afterwards completely destroyed by fire); Fig. 2, a general map of the area destroyed by fire; Fig. 3, the City Hall (this is another example of the want of resistance to earthquake shock displayed by stone or brick structures; the dome sustained by the steel skeleton affords an important comparison of the two systems of construction); Fig. 4 shows part of the area of brick and stone structures destroyed by fire (the steel-frame building on the left is apparently in course of erection); Fig. 5, the Call Building (showing that a properly constructed skyscraper of steel skeleton frame construction will resist both earthquake and fire); Fig. 6 is another example of a steel frame still standing, although the construction was not fire-resisting; and Fig. 7, the well-known Fairmount Hotel.

These photographs are characteristic, but we do not wish to say that they are particularly instructive at the present stage and without technical details; and again referring to the difficulty of obtaining reliable details it must be remembered that the student will have to discriminate as to the amount of damage done to a building by shock before the question of fire-resistance arises.

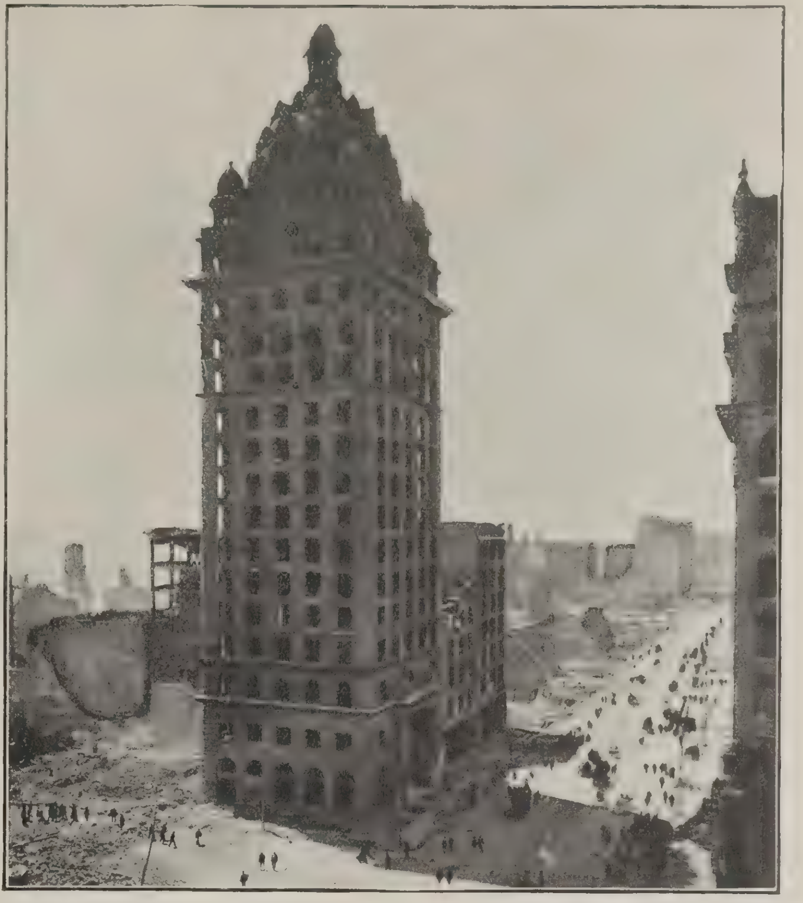


Photo: White Co.

FIG. 5.—THE CALL BUILDING, SAN FRANCISCO.

A steel-frame structure that stood both earthquake and fire, as seen from the eighth floor of the wrecked "Chronicle" Building. The burned mission district is shown in the distance.

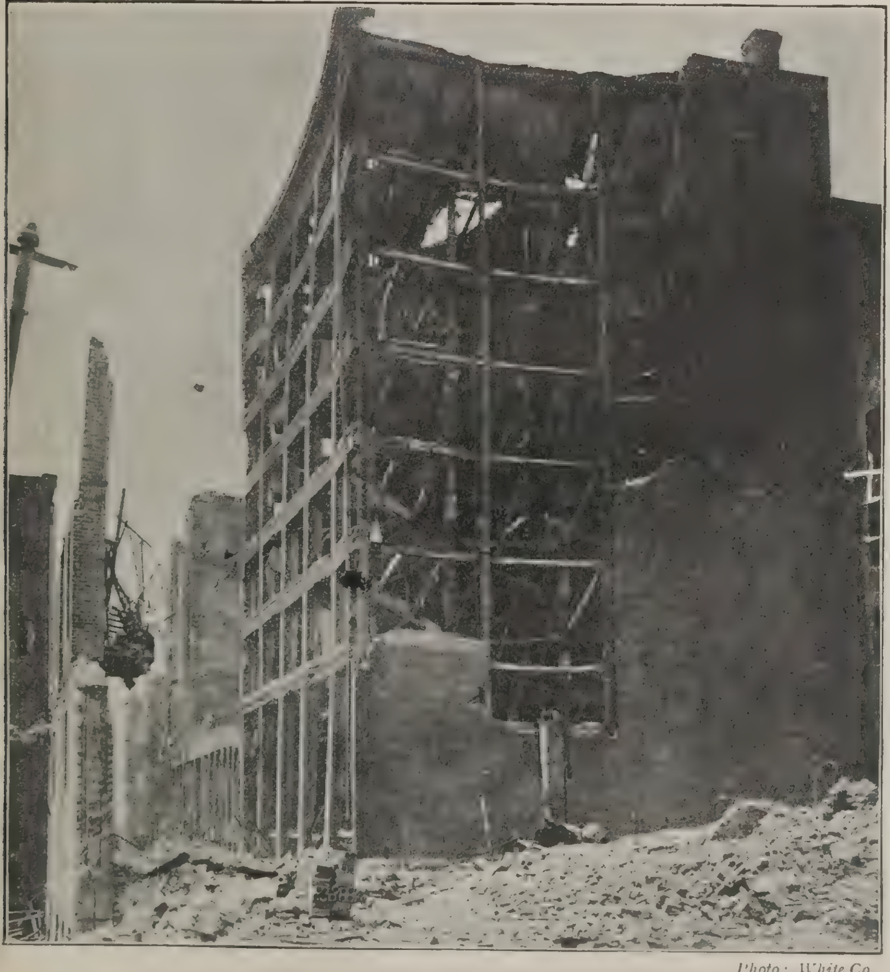


Photo: White Co.

FIG. 6.—THE KAMM BUILDING SAN FRANCISCO.

As to the cause of the great conflagration, its direct cause must be attributed to the earthquake having started numerous fires and at the same time having disorganized the water-supply, the result being that the fire brigade found too many fires on hand to cope with, and had not the necessary extinguishing element—namely, water—at their disposal.

THE LAMBETH FIRE.

We do not illustrate the Lambeth fire, as a careful examination of the ruins did not show us anything that was really of an instructive character, *i.e.*, there were no structural lessons to learn—there was only the general lesson, obvious to all, that property of this description is a serious danger in the midst of a thickly-populated neighbourhood, and that given such circumstances as a heavy gale of wind, a fire commencing in a timber store and joinery workshop could easily some day result in a large conflagration. But London, as a rule, has the good fortune not to have serious fires started during a gale of wind.

Regarding the cause of the Lambeth fire, the suggestion has been put forward on very high authority that it was due to a timber baulk entering into a chimney flue.

The Birmingham Watch Committee's Report should be interesting to the architect and builder, for it tells us that out of 719 fires 120—or about 1 in 6—were fires caused through timber used in the construction of the building being too near the fireplace. This has often been the cause of fires, and special attention needs to be given to it.

NEW FRENCH REGULATIONS

As to Means of Escape from Fire in Shops, Factories and Workshops.

THE following model by-laws have been issued in France for factories, shops and workshops, and should be of interest to architects and local surveyors in this country.

(a) Exits.

The doors of workshops, shops or offices should open outwardly, whether they open on to courts, vestibules, staircases or interior passages, or whether they give access to the open air. In the latter case this is not obligatory unless it has been judged necessary in the interests of safety.

If the doors open on to a passage or staircase, they must be fixed in such a manner as not to project into the passage or staircase when open.

The exits must be sufficiently numerous to allow of rapid egress from the premises; they must always be free and never blocked up with merchandize, stocks or other objects. In large buildings signs, placed in very conspicuous positions, should be fixed indicating the quickest and nearest way out.

In workshops, shops or offices where inflammable materials are handled, if the windows are protected by wirework or gratings, these should be so fixed as to open up outwardly, so that in case of need the windows may form additional means of exit.

(b) Staircases.

Staircases in offices or other buildings serving as places for work shall be constructed in incombustible materials, or shall be walled-in fully in plaster.

The number of these staircases shall be in proportion to the number of persons employed and exits provided from the different floors of a building containing offices or workshops.

A decision of the Ministry of Commerce, taken on the opinion of the Consultative Committee of Arts and Manufacturers, can always, if safety demands it, prescribe a minimum of two staircases.

Each staircase must be able to serve for the simultaneous exit of twenty persons at most, and must have a minimum breadth of 3ft. 3ins.; this breadth must be increased by 6ins. for each new group of fifty employees (or under) using it.

The passages leading into the rooms, also the landings leading on to the staircases, must be of equal width, and must be free from all encumbrance, such as furniture, merchandize or material.

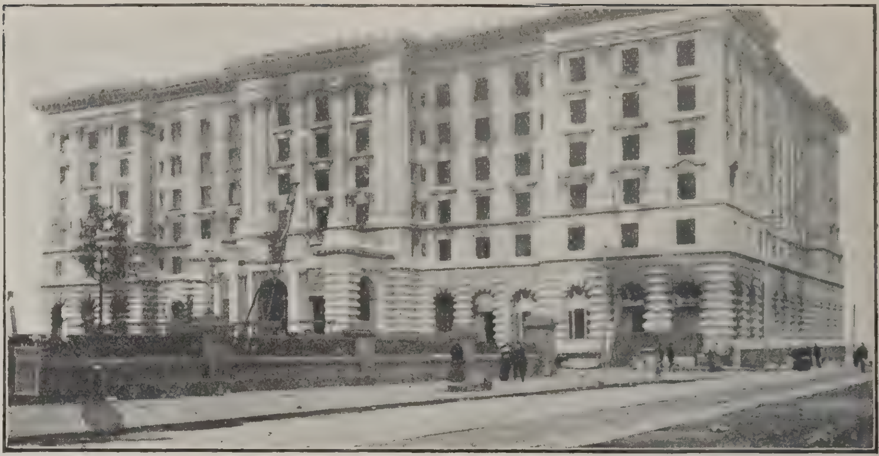


FIG. 7.—FAIRMOUNT HOTEL, NOB HILL, SAN FRANCISCO, SLIGHTLY DAMAGED BY FIRE.

(c) Lighting and Heating.

It is prohibited to use any liquid emitting inflammable vapours inflammable under 35 degs. C. for the purpose of lighting or heating unless the apparatus containing the liquid is solidly closed during work, that part of the apparatus containing the liquid being so closed as to avoid any oozing out of the liquid.

During working hours the refilling of the apparatuses for lighting or heating, for liquid combustion, be it in the workrooms, in the passages, or on the staircases used for the exit of the staff, can only take place by daylight, and on condition that no stoves are alight.

The pipes conducting the gas to the lighting and heating apparatuses must be of metal or covered in metal.

The flames in the lighting apparatuses or portable stoves must be at least 1 millimetre distant vertically and 30 centimetres horizontally (laterally) from all inflammable construction, furniture, stock; lesser distances may be permitted if necessary, as far as walls or ceilings are concerned, if a fire-screen of incombustible material be used which does not touch the wall to be protected.

The portable lighting apparatuses to have a stable and solid base.

Portable or fixed lighting apparatuses must, if the necessity be recognized, be provided by glass, by a globe or wirework, o such other protective covering to prevent th flame entering into contact with inflammabl material.

All inflammable liquids, also material impregnated with such substance or fatt substances, must be kept in metal receptacle closed and air-tight.

These receptacles, as also the gasometer and the receptacles for oil lamp petrol, mus be kept in isolated places and never in th neighbourhood of passages or staircases.

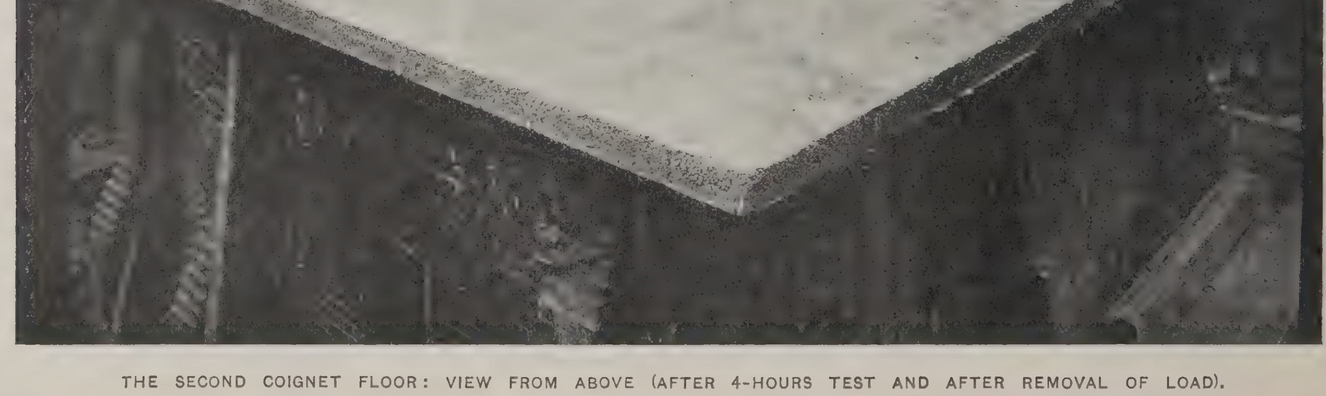
(d) Instructions in case of Fire.

The principals of the establishment shal take the necessary precautions that at th very outbreak the fire may be rapidly an effectively combated.

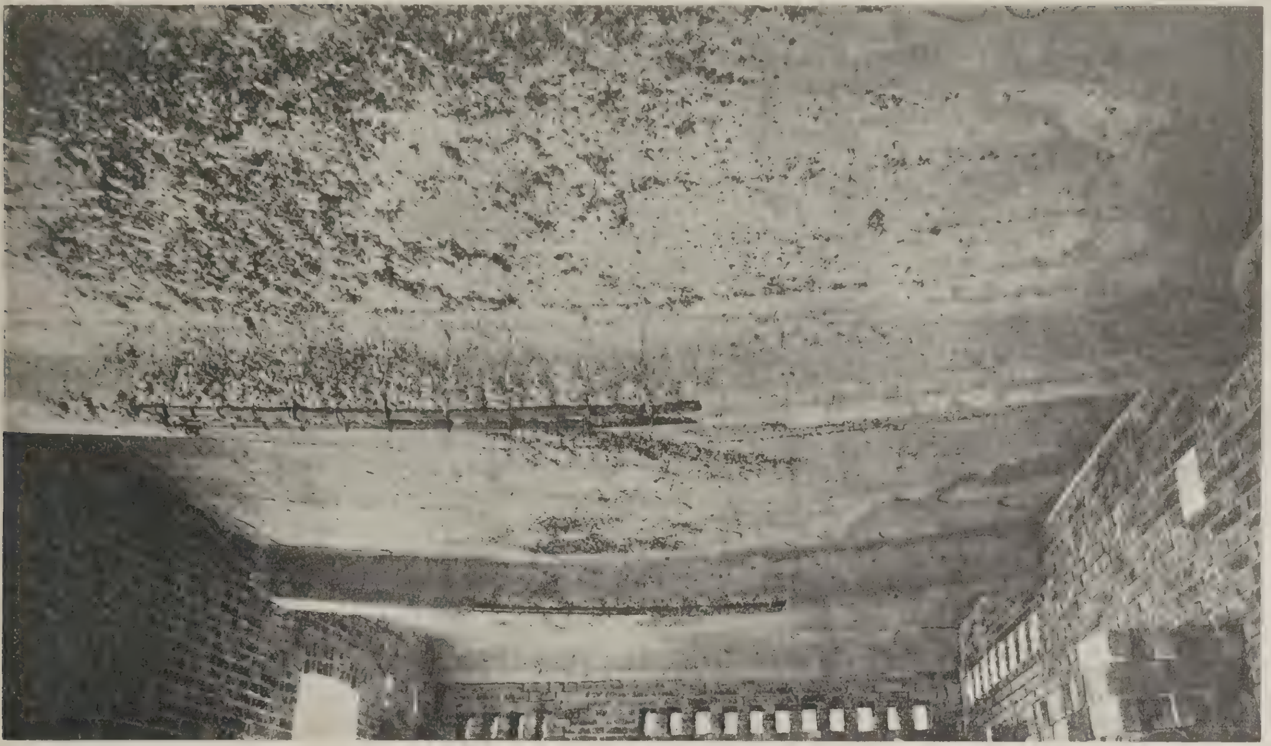
Instructions shall be put up in every par of the building where workpeople ar assembled indicating the means of extinction and of saving which are available, an the procedure to be adopted in case of fire with the names of those responsible for th proper carrying-out of these instructions.

These instructions will prescribe periodica drills to assure that all the materials an appliances be in good condition, and tha the staff may be acquainted with thei usage.

These instructions to be communicated t the foreman on the works; the principal o the establishment is responsible for thei execution.



THE SECOND COIGNET FLOOR: VIEW FROM ABOVE (AFTER 4-HOURS TEST AND AFTER REMOVAL OF LOAD).



THE FIRST COIGNET FLOOR: VIEW OF UNDERSIDE (AFTER 3-HOURS TEST, LOOKING NORTH).

FIRE TESTS.

Reinforced Concrete Floors.

Of the series of reinforced concrete tests that are being undertaken by the British Fire Prevention Committee, two, dealing with floors on the Coignet system, are of the highest possible interest, having regard to the fact that the results can be so easily compared.

Here we have two floors constructed on an identical system, covering an identical area, subject to identical conditions as to application of fire and water, and we only have the difference in construction and time to consider.

In the first test, a three-hours test, the area was divided into three bays; in the second test, a four-hours test, it was divided into four. In the first test the floor rested on the set-off of the surrounding walls; in the second it projected over the walls. In the first case the concrete aggregate was a clinker aggregate; in the second case the aggregate was a furnace slag aggregate. In both cases, however, the cement used was identical, namely, "Ferrocrete" cement being employed.

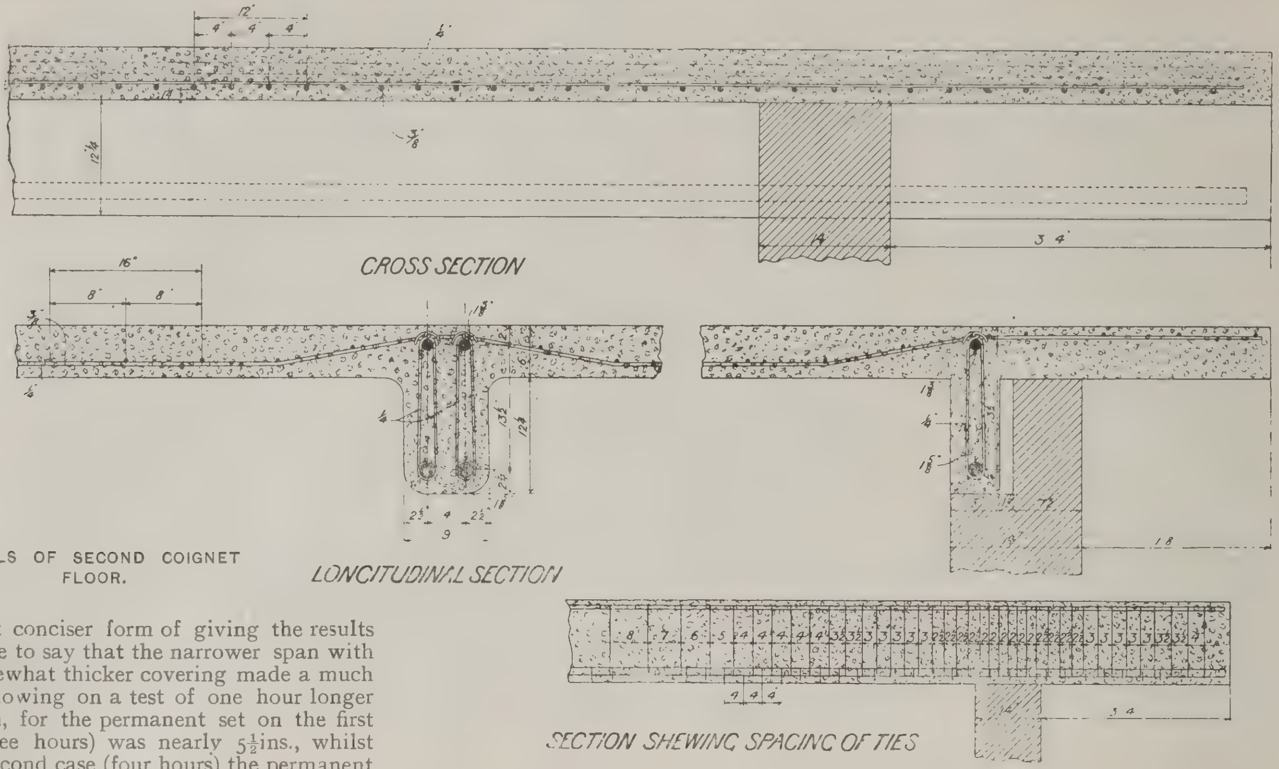
There was also some difference in the thickness of the protective covering to the metalwork in favour of the second test, where the covering was thicker.

Regarding the slag concrete used in the second test, the slag was from an iron foundry at Northampton, and the concrete was made up as follows, namely: $2\frac{1}{3}$ parts of the furnace slag broken small enough to pass a mesh of $\frac{3}{16}$in., 3 parts of furnace slag broken small enough to pass through a 1in. mesh, to 1 part of Portland cement, 13 gallons of water being used to gauge every $3\frac{1}{3}$ cub. ft., and the material being turned over twice dry and once wet.

In the first case the time allowed for drying and setting was forty days, and in the second case thirty-nine days. In each case the centering was struck after fourteen days.

Now the nett result of the two tests are best expressed by presenting the two summaries of the respective reports side by side in tabular form—first the three-hours test and next the four-hours test.

THE SECOND COIGNET FLOOR: VIEW OF UNDERSIDE (AFTER 4-HOURS TEST, LOOKING NORTH).



DETAILS OF SECOND COIGNET FLOOR.

A yet conciser form of giving the results might be to say that the narrower span with the somewhat thicker covering made a much better showing on a test of one hour longer duration, for the permanent set on the first test (three hours) was nearly 5½ins., whilst in the second case (four hours) the permanent set was only 1¾ins.

Again, in the first test, the classification attained ranked as "fully-protective," but only for Class A, owing to the shorter duration of the test; whilst for the second test "fully-protective" classification was attained under the heading "Class B," which comprises the maximum standard classification in Great Britain, practically coinciding with the top standard classification of the United States.

Comparison with other Tests.

We have recorded the tests of the Fire Prevention Committee with other concrete and metal floors, be they termed reinforced concrete, armoured concrete floors or otherwise. Whilst some of the previous floors were not entirely reinforced concrete floors in the true meaning of the word, the beams not being of reinforced concrete, in this instance we have the first example of a leading reinforced concrete system under investigation and passing the universal standards necessary for safe building. Given a slightly thicker protection to the metalwork in a suitable aggregate, the deflection should be nil on the narrower span; and given substantial protection of, say, 2½ins. to 3ins., it should even be nil with the wider spans. The essence of the fire-protective quality appears to lie in obtaining the best possible aggregate that will not fly off, and applying it in a sufficient thickness to keep the metalwork from getting hot. Two inches is what the Fire Offices require in this country; 3ins. is what is required in the United States, and probably (as far as beams and columns are concerned) the medium between these two figures, namely, 2½ins. nett, is what should find general acceptance.

The Thickness of Concrete below.

The resolutions of the recent Fire Congress at Milan speak of a minimum of 2ins., and are careful to point out that no portion of the aggregate should be larger than will pass through a 1in. mesh, but we shall not be surprised as time goes on to find this figure slightly increased and to find building legislation and Fire Office rules figuring 2½ins. for all beams, and probably even slightly more for columns.

The British Fire Prevention Committee's test is eminently instructive. It will be followed, we understand, by further tests on reinforced concrete, with all the important systems hailing from the United States, and as time goes on we may also no doubt anticipate tests with further Continental systems.

There is one point that should not be overlooked, however, in the design of the floors that were under test on the Coignet system. The upper members in the beams were stirruped together with the lower members, and these upper members must play an important *rôle* in reducing the possibility of deflection.

We now present the summaries: —

Fire Tests with "Coignet" Reinforced Concrete Floors.

Section under test, 15ft. by 22ft. 3in. "Universal Standard" conditions. Load, 2½ cwt. per ft. super.

FIRST TEST.	SECOND TEST.
3 *hours of fire* (*to* 1,800 *F.*). 5 *minutes of water.*	4 *hours of fire* (*to* 1,800° *F.*). 5 *minutes of water.*
The time allowed for drying was forty days (autumn).	The time allowed for drying was thirty-nine days (spring).
The centering was struck after fourteen days.	The centering was struck after fourteen days.
Summary of Effect.	*Summary of Effect.*
Within 1 minute after the lighting of the gas the plastering to the soffit of the floor began to fall, and continued to do so until the end of the test. After 15 minutes the floor began to deflect downwards, and continued to do so until the end of the test, when a maximum deflection of 5·60in. (·140 m.) was observed.	At the expiration of 30 minutes the floor began to deflect and continued to do so till the end of the test, when a maximum deflection of 4·30in. (·109 m.) was observed. Simultaneously, the overhanging parts of the floor on the east and west sides began to rise, and continued to do so till the end of the test, when a maximum rise of 3·10in. (·079 m.) was observed.
On the application of water the concrete to the soffit of the beams where struck by the jet was knocked off, exposing the iron rods in the lower part of the beams. The soffit of the floor was also eroded where struck by the jet, exposing in two bays the longitudinal iron rods.	On the application of water the concrete to the soffit of the beams where struck by the jet was knocked off, exposing one rod in the lower part of beam A for about 4in. (·10 m.) and two rods in beam C for about 6ft. (1·829). The soffit of the floor was also eroded where struck by the jets.
On the load being removed it was found that the upper surface of the floor showed transverse cracks in the direction of the beams and diagonal cracks at the corners.	On the load being removed it was found that the upper surface of the floor showed transverse and diagonal cracks.
The permanent set of the floor was average 5 7/16in. (·138 m.). Neither fire, smoke, nor water passed through the floor.	The permanent set of the floor was average 1¾in. (·044 m.). Neither fire, smoke nor water passed through the floor.
	Classification: "Fully-protective (Class B)" was obtained.

SAFETY IN THEATRES.

ON the important question of the fire-resistance of scenery, the London County Council have been making some interesting experiments, which are reported in the Minutes. As a result of their enquiry the Theatres Committee were of the opinion that the degree of fire-resistance obtained by dipping light fabrics in the fire-resisting solutions usually employed is quite satisfactory, and that as regards scenery generally the degree of safety that is obtained by brushing over the back of the canvas is all that could be required. They, however, go on to indicate that there is a doubt as to whether the efficacy of the treatment is impaired when the scenery is in constant use, and thus a further report will be called for some six months hence.

We are very much at one with the London County Council's endeavour to investigate this question of the fire-resistance of scenery, but such investigations are of course quite *ex parte*, inasmuch as they are solely undertaken in the interests of the public authority, and not in the joint interests of the theatre manager and the representatives of the public by some independent third parties, as should be the case.

Further, the question has not only to be considered as to whether the efficacy of the treatment remains, which we agree is doubtful beyond a certain very limited period, but whether such treatment does not affect very seriously the value of the theatre manager's property by dimming the colours, which gradually fade, and further rotting the canvas.

The Special Commission of the British Fire Prevention Committee visited Italy on the occasion of the Milan Congress, returned to London by way of Lucerne, Zurich, Strassbourg and Mulhausen, in each of which cities the Public Authorities accorded the Commission every facility to obtain an insight into the fire-preventive arrangements and fire-service organization; also extending their hospitality to the members of the commission, who comprised Messrs. Edwin O. Sachs, F.R.S.Ed. (chairman), Ellis Marsland (hon. sec.), Max Clarke, F.R.I.B.A., James Sheppard, A.I.E.E., Percy Collins, F.S.S., and F. Farrow, F.R.I.B.A.

THE BUILDERS' JOURNAL

AND ARCHITECTURAL ENGINEER.

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SPECIAL SUPPLEMENT.
The Ritz Hotel, Piccadilly, London.

Public Spirit in the East. THE Whitechapel Art Gallery is a notable effort to bring a little culture into the sordid lives of the residents of the East End. There is now open in it, until July 19th, "The Country in Town Exhibition," an attempt, firstly, to educate the public in those little arts and industries which will enable gardens to be created on window-sills and on roofs, and, secondly, to awaken interest and understanding in the plants, birds and animals to be found in our public parks. The exhibition, however, covers a wider ground by showing what has been done in the creation of garden cities such as those at Letchworth, Bournville, and Port Sunlight, and in these sections there are many photographs and drawings of designs for small houses, as also the interesting suggestions of Professor Patrick Geddes for improvements at Dunfermline and Edinburgh, and Mrs. Barnett's proposed Hampstead Garden Suburb. The Metropolitan Public Gardens Association also exhibit plans of the various improvements with which they have been concerned; and particularly interesting is the exhibit of plans, photographs, drawings and publications lent by the Town Council of Dresden, showing the manner in which the growth of cities in Germany is controlled and the precautions that are taken by the drawing up of a thoroughly-thought-out scheme to avoid the problems that arise where there is no appreciation of future developement. The most interesting exhibit, however, is a scheme for the improvement of Mile End Road, Spitalfields and Shadwell districts, drawn up by Mr. Imre Kiralfy, the well-known organiser of Earl's Court and other exhibitions held in London. Mr. Kiralfy has always shown talent for making schemes financially possible which seem too imaginative. We feel, therefore, that although this scheme of his is so ideal, it is not beyond the bounds of possibility. He assures us that it would be financially profitable even to private individuals or financiers as an investment. If that is so, then we do not despair of public authorities taking up the matter. With the Mile End Road, Mr. Kiralfy's task was easy. Waste land exists along the sides, and he feels it only necessary to lay out gardens there. Spitalfields, however, is a crowded district for which there seemed little hope until Mr. Kiralfy showed how an improvement could be effected. His plan shows how to widen the various streets (without the sacrifice of any floor space in buildings) by pulling down low buildings and erecting high ones in their place. The chief point in Mr. Kiralfy's scheme is that he would replace the old houses between Dorset and White Streets with a garden, and the triangle between Commercial Street, Shepherd's Street, and a new street to be made, by another garden. The block of houses including those in Butler Street, Freeman Street, Palmer Street and Tilley and Tenter Streets Mr. Kiralfy would replace by a lofty trades emporium, somewhat on the lines of the French and Belgiam bazaars or the American stores. The treatment, however, for the dreary Shadwell district is the most captivating. The area around Shadwell market, now closed, seems at present like one of those ancient cities of the dead. Mr. Kiralfy would transform the whole area. He would pull down the wretched buildings surrounding the market and erect a series of large buildings, three of them facing a fine recreation ground with a terrace leading down from the hill above, and through one of the large buildings he would construct an arcade leading to another garden. Finally, he proposes pleasure gardens sloping down from High Street in terraces 220ft. wide by 90ft. deep. The pleasure gardens, 250ft. wide by 180ft. deep, would have a bandstand in the centre and imposing buildings on either side. On the Thames front he would arrange a museum and library with a fine verandah and terrace 60ft. wide by 200ft. long, directly facing the Thames, and below these, public swimming baths, assembly halls, gymnasiums, &c. Such a river terrace with public buildings would really be a magnificent improvement for the East End of London, and we can only hope that Mr. Kiralfy's suggestion will receive careful thought by the London County Council and local authorities directly concerned, and that it may lead to action.

Public-Houses. IT is much to be regretted that the majority of public-houses in this country are designed with such a display of tawdriness. This is not so much the fault of the architects, however, as of the public. There are a few architects who have obtained a reputation for public-house work, and who take trouble to produce quiet, respectable buildings; but most brewers and publicans seem to employ the smaller fry of the profession because they feel that they can dictate to them and secure the blatant specimens which we so constantly see—specimens which evidently satisfy the taste, or want of taste, of the owners. In respect of this matter, we notice that some very interesting remarks were made last week by the chairman of the Birmingham Transfer Sessions, Mr. Alexander M. Chance, holding out a promise of better things. Many architects were in court in connection with the various applications for alterations to licensed premises, and the chairman said he wanted to call their special attention to the style of public-house buildings, and, through them, to direct the attention of the brewers they represented to the matter. His colleagues on the Bench, he added, fully concurred in what he was about to say. He was not going to be so foolish as to raise the question of taste, but he wanted to point out that, whilst terra-cotta had its advantages, sometimes it might be of tints which they were not altogether accustomed to associate with that material. He thought that, for the benefit of the city, more variety was needed in the style of public-house architecture. For instance, he could not understand why an architect should not take advantage of some of the beautiful specimens of oak buildings which they saw scattered about the country at Chester, Hereford, Leominster, and other places. Glaring colours should be avoided. He felt sure they would like to improve the general appearance of the Birmingham streets, and to effect this he thought architects should adapt the style of architecture somewhat to the surroundings of the neighbourhood and to the name of the house. With these very moderate remarks we are in sympathy, and it is to be hoped that when the persons in authority express such decided views, some reform may be effected among the publicans and brewers seeking to alter and rebuild their premises. The part which these Birmingham magistrates are playing is allied to the public censorship which has so often been advocated in the matter of architectural design, and if the suggested censorship could be worked as smoothly and as logically as this, we should all wish that it were established immediately.

R.I.B.A. EXAMINATIONS.

Model Answers by A. G. Bond, B.A., A.R.I.B.A.

The Intermediate Examination.

Subject I.—Varieties of Classic Ornament.

[*Time of examination, one hour-and-a-half. Maximum number of marks* 50.]

1. *Give a sketch of any well-known example of a Corinthian capital, the diameter of the column to measure* 1½*ins., stating where it is taken from.*

See sketch below.

2. *Show by sketches to a bold scale the method of projecting the plan and elevation of a Corinthian capital.*

See sketches below.

3. *Illustrate by description and bold line drawing, showing one or more of the methods employed for delineating the Ionic volute.*

See sketches.

4. *Illustrate by description and bold line sketches at least four of the following terms:—Abacus, astragal, caulicolæ, cavetto, dentils, epistyle, guttæ, scotia.*

Abacus: A rectangular member between the capital and entablature. It varied very much both in depth and shape on plan in the various styles and countries. (Fig. 1.)

Astragal: A small bead or circular moulding (a small torus) often occurring between larger mouldings in place of a square fillet. (Fig. 2.)

Caulicolæ, or Caulicoli: The slender stems springing from the caules (Latin, *Caulis*, a stalk), the eight greater stems around a Corinthian capital. (Reference could be made to those shown in the capital in question 1.)

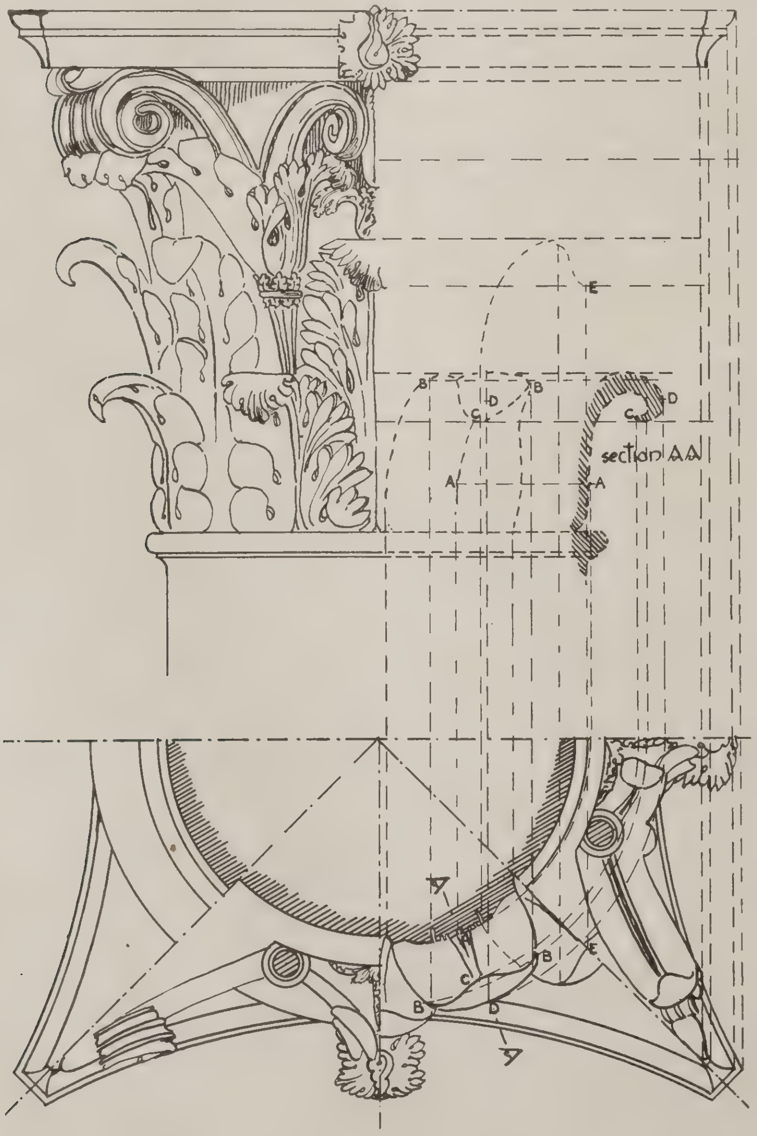
Cavetto: A simple hollow or concave moulding. (Fig. 3.)

Dentils: Tooth-like ornaments occurring first in the Ionic cornice. (Fig. 4.)

Epistyle: (Greek, 'επι στμλος upon a column). Epistylium or architrave, the lowest of the three principal divisions of the entablature of an Order. Fig. 5 shows a Corinthian example.

Guttæ: The small truncated cones or pyramids in the Doric Order used under the triglyphs in the architrave below the tænia and on the underside of the mutules of the cornice. (Fig. 6.)

Scotia: The hollow moulding to the base of the column between the fillet of the torus mouldings. In the Roman it was generally formed by the junction of arcs of different radii, but in the Greek work it was an elliptical curve. (Fig. 7).



SUBJECT I:—ANSWERS TO QUESTIONS I AND II.

Subject II. — The Characteristic Mouldings and Ornaments of each Period of English Architecture from A.D. 1000 to 1550, with their Application.

[*Not more than four questions to be attempted. In all illustrated answers sufficient jointing must be clearly indicated to show construction; but mere repetition, in any form, is not wanted. Time of examination, two hours. Maximum number of marks* 75.]

1. *Write a brief account—illustrated by marginal sketches—of the gradual change in the sectional profile of stone vaulting ribs during three centuries from c. A.D.* 1100 *onwards, the connection of the rib with the vault-filling to be clearly indicated in the sketches.*

The changes in the sectional profile of English stone vaulting ribs may be divided into three phases. First, the tendency was to diminish the dimensions of the ribs; secondly, the visible mouldings were varied, following very much the same changes as the mouldings of other features of the same periods, care being taken that when lierne and other subsidiary ribs were introduced the moulding should be such that it could be subdivided without awkward mitres; and thirdly, constructive changes took place in the section of the rib—thus in the earliest the filling was carried over the rib entirely, but later the rib itself was rebated to take the filling, until at the end of the fourteenth century the rib and filling are worked from one stone, the filling really becoming merely a sunk panel on the face of a solid spherical vault. The three marginal sketches, which are drawn approximately to the same scale, illustrate these several changes (see p. 18).

2. *Illustrate, full-size, in a workmanlike way two typical thirteenth-century capitals to circular stone shafts 4ins. in diameter.*

(1) *Moulded only.* (2) *Foliated.*

See illustrations on p. 18.

3. *Draw, in full-size section, a series of base mouldings (three at least), each of a different century, to stone shafts 4ins. in diameter, assigning to each approximately an appropriate date.*

See sketches on p. 18.

4. *Write a brief account—illustrated by marginal sketches—of the gradual change in the sectional form of main-arcade arches during three centuries from c. A.D.* 1100 *onwards, the relation of the arch-mould to its supporting pier or column to be clearly indicated in the sketches by showing their respective positions on plan one over the other.*

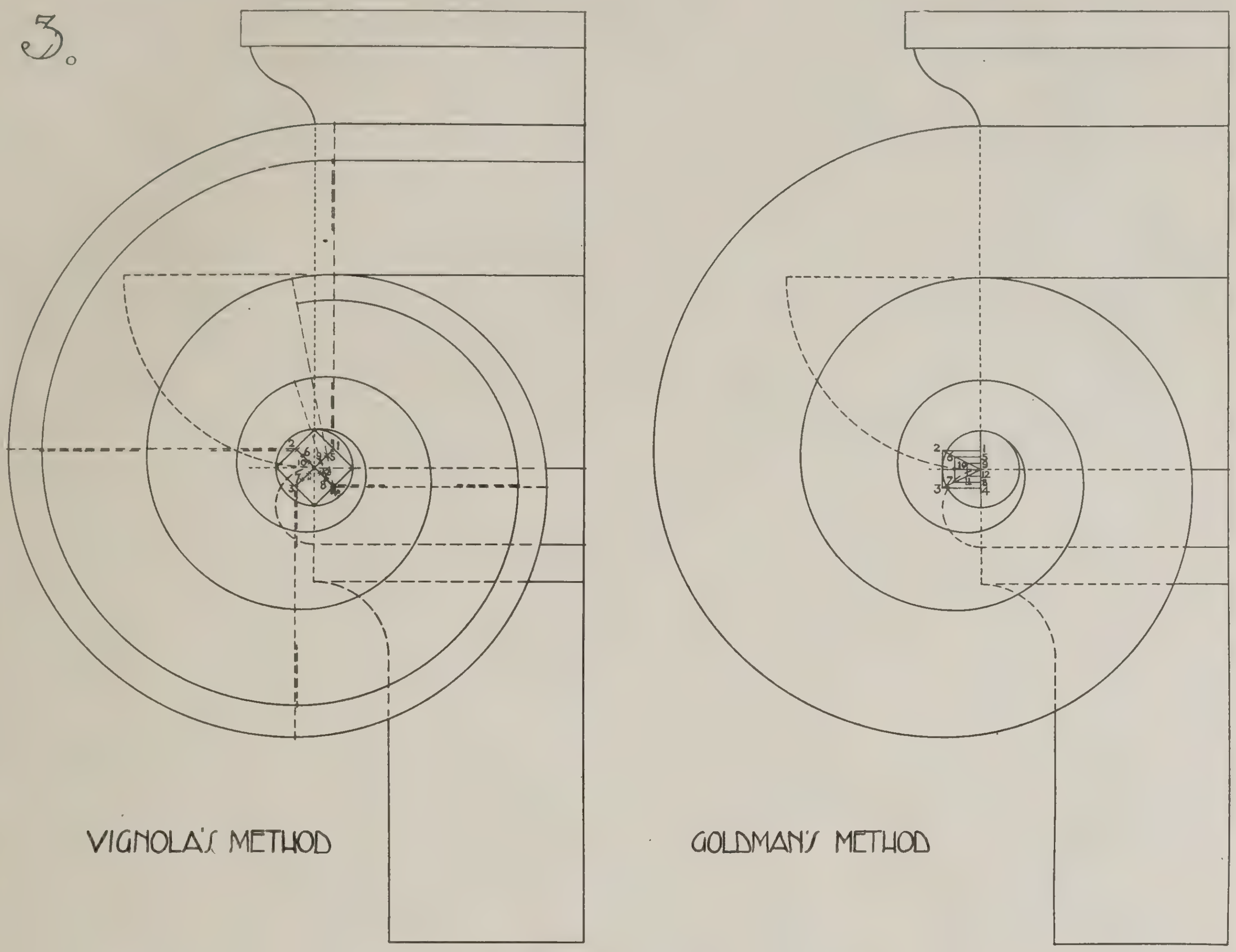
In the twelfth century the nave arcades were usually semi-circular in form and built in receding orders, sometimes plain but often enriched with simple bowtels or zigzag moulding; the piers were massive and either round, square, or built in orders similar to the arch, or with shafts.

The pier and arch were in all cases separated either by a capital or string, and the later shafts occasionally had a band about half-way up.

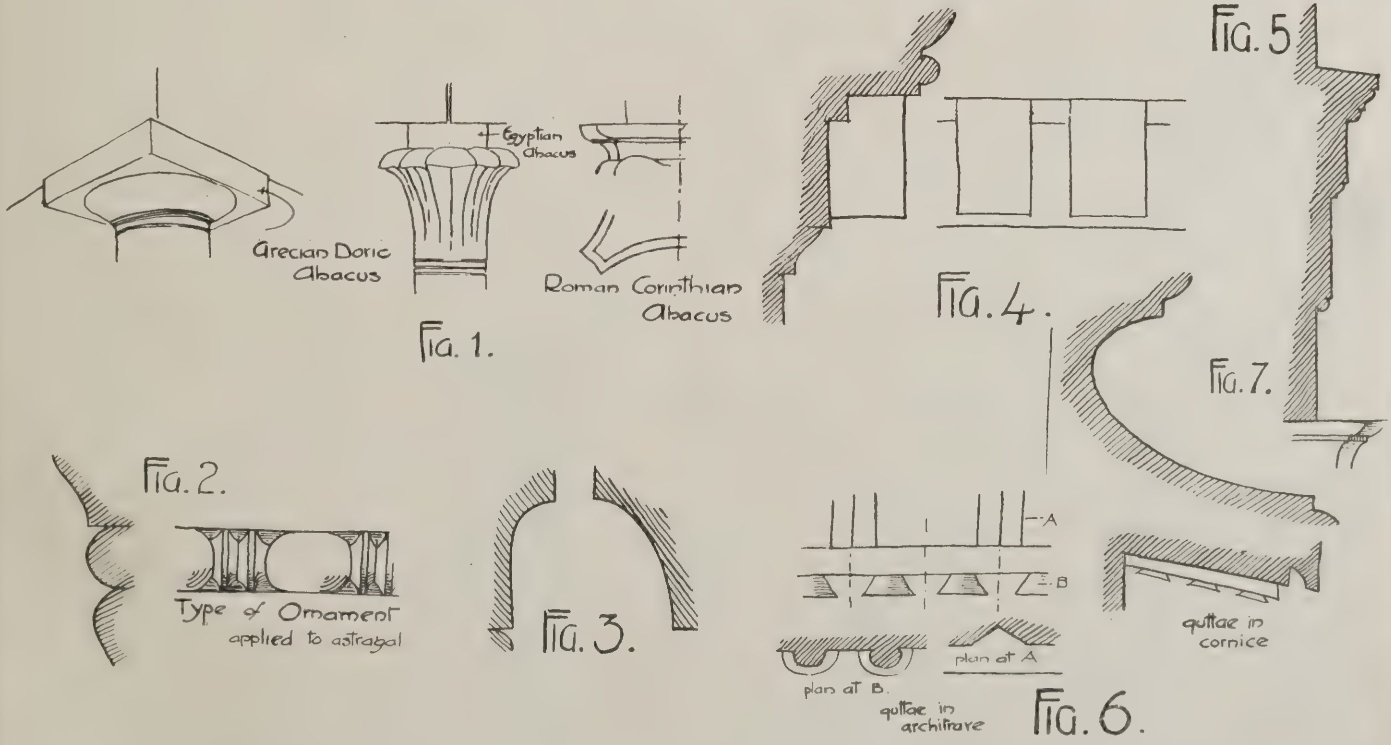
In the thirteenth century the arches were generally pointed, sometimes lancet, very richly moulded and often enriched with dog-tooth ornament. The arch mouldings were intricate and undercut and were often in quite irregular planes.

The piers, generally circular, almost always have bands and surrounding shafts, often detached.

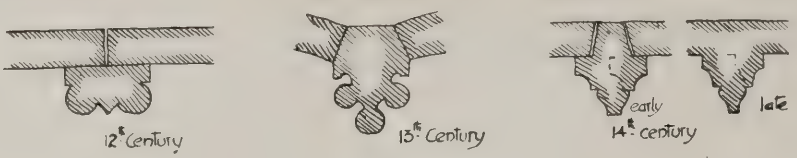
3.



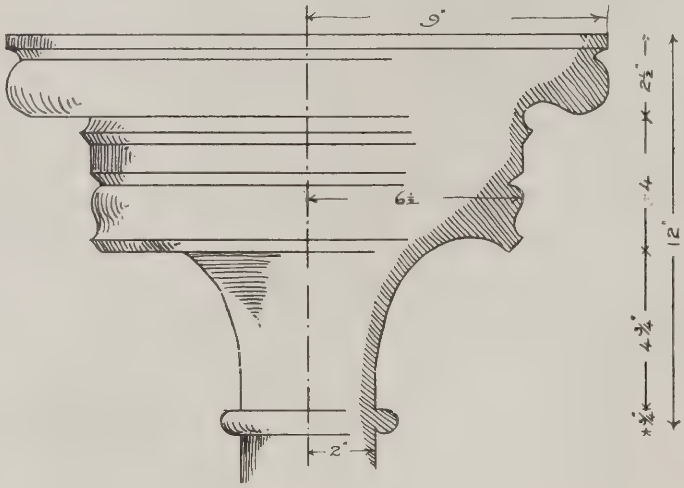
ANSWER TO QUESTION 3.



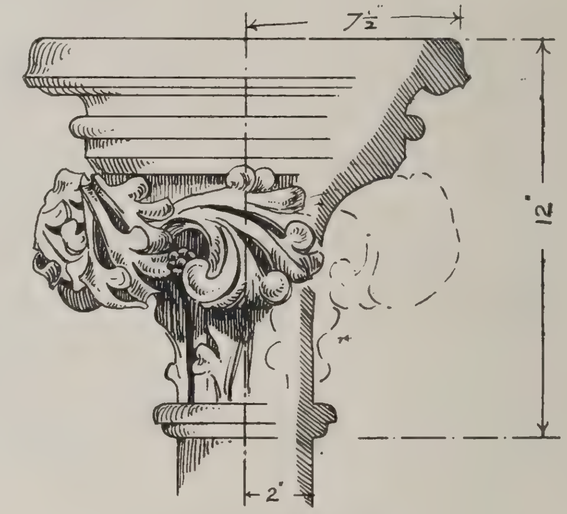
ANSWERS TO QUESTION 4.



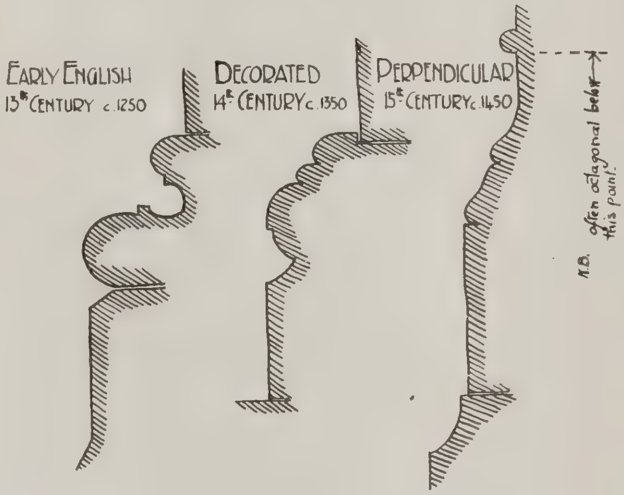
Answer to Question 1.



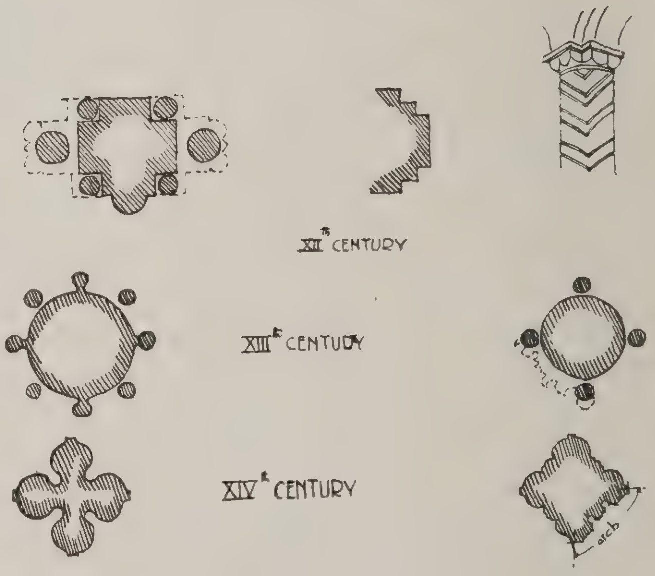
Answer to Question 2 (1).



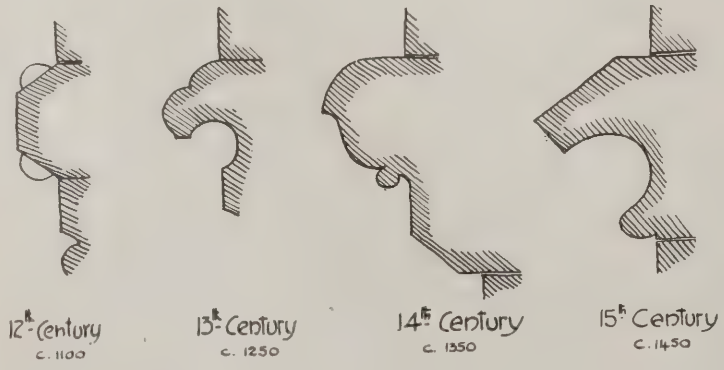
Answer to Question 2 (2).



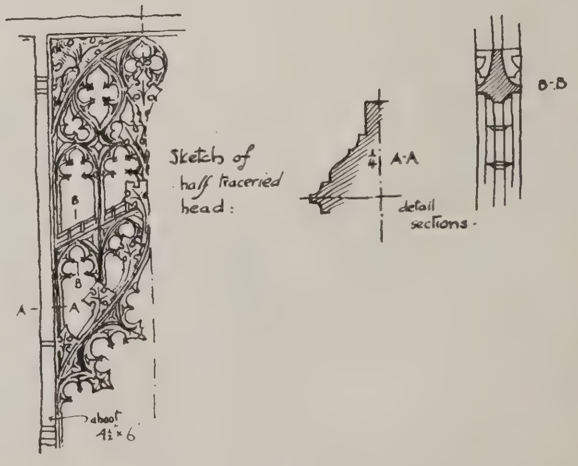
Answer to Question 3.



Answer to Question 4.



Answer to Question 5.



Answer to Question 6.

R.I.B.A. INTERMEDIATE EXAMINATION: SUBJECT II.

In all cases the arch mouldings and piers are separated by capitals and generally the arch overhangs the face of the piers very considerably.

In the fourteenth century the equilateral nave arch was the most common form; in this century some of the arch mouldings were often continued down the pier without being stopped by the capitals; the mouldings are larger but less undercut and are divisible into orders.

The piers are arranged diagonally and the shafts are almost always attached and are often filletted; in the smaller churches octagonal piers are common in this period. Horizontal bands are not used.

The ogee moulding is common and the hollows are often enriched with four-leaved or ball flowers.

5. *Draw, full-size, at least four different sections of hood moulding to stone arches, illustrating variation in the profile of this member from the twelfth to the fifteenth century, and assign approximately to each example an appropriate date.*

See sketches.

6. *A fifteenth-century oak screen is framed into open upper panels, having heads of pierced tracery, moulded and cusped.*

Illustrate one of these heads by a sketch and give to full-size the moulding of one of the main uprights of the screen comprising the tracery-bar and its cusping.

See sketch.

R.A. ARCHITECTURAL SCHOOL.

From October 1st next the Architectural School of the Royal Academy will be open five evenings in the week (Monday, Tuesday, Wednesday, Thursday, Friday), from 6 p.m. to 8 p.m., instead of three as now. Applicants for admission to the school who can produce a certificate of fair proficiency from an institution for architectural education recognised by the Royal Academy will be exempt from the necessity of showing the work required for the admission of probationers. These institutions are:—The Royal College of Art; the Architectural Association; King's College, London; University College, London; Liverpool University; and Manchester University. The list may be added to at the discretion of the president and council. The first date for the admission of probationers under this new system will be Tuesday, July 31st. The certificates, together with the printed form to be previously obtained from the Royal Academy and duly filled in, and the certificate of birth, must be delivered at the Royal Academy on Saturday, July 28th. The examination of the successful applicants for admission as students will be held in October. Any further information can be obtained on application at the Royal Academy, Burlington House, Piccadilly, W.

Obituary.

Mr. W. J. Grant, F.R.I.B.A., of Hastings, died last week, aged 83.

Mr. John Wills, senior partner in the firm of Messrs. John Wills & Sons, architects of Derby and London, died recently. He carried out a great deal of nonconformist church work.

Mr. J. H. Christian, late architect to the Ecclesiastical Commissioners, died in London last week, aged 74. He was the younger brother of the late Mr. Ewan Christian.

Correspondence.

Finchley Cottage Hospital.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—Your interesting article on the above inspires me to ask reasons for some of your remarks, as from one seeking instruction who has not seen the exhibited plans. From your rough sketches it would appear that in plan No. 1100—which you extol—all traffic to the future ward would be through the isolation block. Is not this a startling innovation in hospital planning? What is there in the verandahs on the northern side that calls for special commendation on your part, or what in the extreme length of corridor and varying distances from the administrative centre to the several blocks? Your favourable comments re future extension—symmetry, orientation, light and air to wards, convenient placing of administrative department—appear to be equally, if not more, applicable to plan No. 1101. Your kind enlightenment on these points would be gratefully received by, perhaps, others of your readers besides myself.—Yours truly,

ROGER F. BACON, A.R.I.B.A.
LONDON.

[Isolation wards should have no place in a cottage hospital, for infectious cases should be at once removed to an infectious diseases hospital. The wards were marked as isolation upon the competition drawings in compliance with the conditions, but it was the author's intention that they should be used as rooms for paying patients, and this was stated by them in their report. The objection to the access to the future extension is thus removed. As regards the distance of the future extension from the administrative block, this is really not great, especially when compared with similar distances in large hospitals. We are not aware that we specially praised the northern verandahs, or did more than merely mention their existence. It is, unfortunately, difficult to go into further details of the scheme until it is possible to publish the plans themselves. There may be points for criticism in the design in question, but even so, the scheme as a whole, appeared to us to possess greater merits than any of the others which were submitted.—ED. B. J.]

Pecksniff's Defence.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—May I crave a portion of your valuable space to protest against Mr. Sampson's sneers at my immortal relative, the late Mr. Pecksniff. Since a novelist, whose works have ever been dear to the intellect of the middle-classes, held him up to scorn, he has suffered much unmerited obloquy, and such is the force of unreasoning prejudice that I do not recollect a voice being raised in his defence. Is it not a little pathetic to find Mr. Sampson and Mr. Bonner trotting out the hoary fallacy that an architect should of necessity make his own designs? Truly the illusions of youth die hard with some. Do we ask an engineer if his designs are his own, or insist that our accountant personally audits our books? Do we complain if our lawyer admits employing a conveyancer? Are we shocked to find that the successful patentee is rarely an original inventor? An architect is instructed to produce designs for a building suited to a given purpose, and his success is in proportion to their merit. His clients neither ask for nor desire any guarantee that they are the product of his own brains. Why, then, is he immoral if he realises that he can buy or organize better ones than he can himself produce? Mr. Sampson refers to a practitioner, now, alas, deceased, who carried out with great success the principles of my illustrious relative, and he adds he was very successful in his competitions. This tempts one to ask why, if the men who assisted him could have been equally successful without him, they did not embrace the opportunity? The conclusion is forced on one that there was more in this emulation of Pecksniff than they grasped. Do Mr. Sampson and Mr. Bonner really think the glorious genius of the Pecksniffs will be stifled by registration, by a close profession however enacted; or that assessors, however chosen, have any terror for them? No, modern conditions demand skilled organisers, and despite envious depreciation, the Pecksniffs have ever been expert organisers.—Yours truly,

PECKSNIFF MINOR.

Notes and News

The North Transept of Hexham Abbey, which was in a dangerous condition, has been put into a state of thorough repair at an expenditure of nearly £2,000. The present stables, &c., abutting the west wall of the ancient church are to be removed.

A Cottage Hospital at Ramsey is in course of construction from designs by Messrs. Henman & Cooper, of Birmingham. The cost of the building will be about £6,000, and the contractors are Messrs. Callow & Sons, of Ramsey.

St. Muredach's New Diocesan College, Ballina, is approaching completion. The plan embraces a central block and two wings, giving a total frontage of 144ft. The total expenditure will be £16,000. The architect is Mr. W. H. Byrne, of Dublin, and the contractors Messrs. McKee and McNally.

The New High-Level Railway Bridge at Newcastle-on-Tyne, constructed by the Cleveland Bridge & Engineering Co., Ltd., of Darlington, to the designs of Mr. C. A. Harrison, chief engineer of the northern division of the North-Eastern Railway, was opened by His Majesty the King yesterday. The contract ranks as the largest of its kind in this country since the completion of the Forth Bridge. The design comprises four spans of steelwork supported on piers of granite.

University College (London) Architectural School.—At the prize distribution last week the Donaldson silver medals for general excellence were awarded to H. B. T. Morgan and B. M. Goodwin. The college diploma, which exempts from R.I.B.A. intermediate examinations, was, on the recommendation of Mr. John Slater, B.A., awarded to H. B. T. Morgan, B. M. Goodwin, and F. A. Richards. In the evening school, held under a grant from the Worshipful Company of Carpenters, prizes were awarded as follows:—Design Class: *1st Prize,* H. A. Welch; *2nd Prize,* R. S. Bowers; *Hon. Mention,* G. B. Bridgeman, H. B. T. Morgan, T. J. Wills. Elementary Design Class: *1st Prize,* R. J. Hunt; *2nd Prize,* R. Cromie.

THE TIMBER TRADE.

London Market in June.

A SMALL business at improving prices about sums up the record of the timber market for London in June, and perhaps applies with sufficient accuracy to that of the country generally, and to the negotiations for further supplies from the exporting countries also. The deliveries from the docks in June in London have been 600 standards less, and overside 3,600 standards less than in June last year. For the first half of this year they have been 8,400 standards less from the docks and 2,500 standards less overside than for the same period of 1905. Messrs. Churchill & Sim state that while this continues to be the case it is impossible to feel that the situation is entirely healthy, but, in spite of it, prices here and everywhere else have been improving all the time and the general trade of this country has been improving also. If and when an improvement does occur in the demand for wood, it will come upon markets very sensitive to any such influence and dominated by many causes pointing to difficulties of supply from many quarters.

Messrs. Denny, Mott & Dickson, Ltd., report on Baltic and White Sea goods as follows:—

"Contrary to general expectations, the better tone prevailing in May did not extend to June, which month has been characterized by dull trade. Prices, however, have been maintained; but it is becoming increasingly difficult to hold to the advance established in May. The slackness of trade has effectively checked speculation. Transactions therefore are necessarily small, and calculated to cover immediate requirements only. It is already evident that it will require something more than mere rumour as to a prospective shortage if the remaining half of the year is to compensate holders for the poor consumption of the past six months."

The abstract of dock stock, consumption, &c., for June, published by Messrs. Foy, Morgan & Co., is given in the table at the foot of this page.

Dock Stock.

The stock of wood in the public docks on June 30th was:—

	Pieces.
Foreign deals and ends - - -	782,000
Do. battens - - - -	1,129,000
Pine deals and battens - - -	541,000
Spruce do do. - - -	439.000
Boards, rough - - - -	2,488,000
Do. prepared - - -	5,241,000

totalling 10,620,000 pieces, as against 13,012,000 in 1905, 15,437,000 in 1904, and 15,657,000 in 1903.

In other kinds the stock was as follows:—

Foreign wainscot logs - -	409 pieces.
Do. oak timber - -	497 loads.
Do. fir timber - -	2,131 do.
Do. Oregon pine, &c., spars and masts - -	4,310 do.
Colonial oak timber - -	935 loads.
Do. birch timber and planks -	3,676 do.
Do. elm and ash timber -	605 do.
Do. yellow pine - -	307 do.
Do. red pine - - -	32 do.
United States pitch-pine timber	16,889 do.
Do do. deals -	11,000 pieces.
East India teak - - -	7,885 loads.

Deliveries.

The deliveries have been—

	First six months. Pieces.	June. Pieces.
Foreign deals and ends -	1,572,000	194,000
Do. battens - -	2,626,000	330,000
Pine deals and battens -	526,000	82,000
Spruce do. do. -	594,000	91,000
Boards, rough - -	2,558,000	295,000
Do. prepared - -	6,847,000	1,052,000
Total - -	14,723,000	2,044,000

The deliveries from ship to craft have been—

	First six months. P.s.h.	June. P.s.h.
Deals and battens - -	31,662	14,037
Boards - - --	9,214	3,706
Total - -	40,876	17,743

Soft Woods.

Swedish Deals and Battens.—The supply of deals has been normal and prices unchanged. Of battens there has been a deficient supply and rates were perhaps 5s. per standard higher than in May. Of prepared boards the new supply has been a good deal smaller than usual, and for these the demand has been sufficiently active to affect prices favourably throughout the month. Swedish shippers have raised their prices for summer and autumn shipment for flooring and all battens and scantlings during the month and have effected a fair amount of business on the new terms.

Norwegian Boards.—The supply of flooring boards from the Norwegian ports has been a fairly large one, bringing the dock stock up to rather more respectable dimensions. The demand has been satisfactory throughout the month and prices have advanced steadily, the market being supported by the rise in quotations for the autumn shipments from Sweden.

Russian Deals.—The arrivals so far have been small and have consisted chiefly of deals with a much smaller proportion even than usual of battens and scantling. Prices in London have been maintained at recent levels. Shippers have been greatly troubled with labour difficulties, but have overcome them with some measure of success, and shipments are now taking place with fair regularity. For the lower qualities of deals for autumn shipment, quotations have declined some 5s. per standard below those obtained for the open-water exportations.

Finnish Scantlings.—The fresh importations of scantlings to London continue on a very small scale, and the market all round is very firm. At the Finnish ports also the labour difficulties in connection with the open-water shipments have been very great, although the conditions prevailing in this respect at the end of the past month showed a sensible improvement.

Prussian Timber.—The fresh supply of fir timber has been quite small, but even so the stock is accumulating to something like normal proportions, and quotations are weak.

Canadian Timber.—The demand for pine deals has continued at the slow rate which has now been normal for some years past, and quotations are unchanged. The markets in Canada are as firm as possible and must evidently continue so throughout the season. Of spruce deals the arrivals have, up to the present, been quite abnormally small, and this state of things seems so likely to continue that, in spite of a ragged demand, the market improved in June and prices are definitely higher.

Hard Woods.

Teak.—Messrs. Denny, Mott & Dickson report that the landings in the docks in London during June consisted of 639 loads of logs and 178 loads of planks and scantlings, or a total of 817 loads, as against 868 loads for the corresponding month of last year. The deliveries into consumption were 695 loads of logs and 230 loads of planks and scantlings—together 925 loads, as against 885 loads for June, 1905. The stock remains practically on a level with that of a year ago.

The imports during the first half of the year amounted to 5,201 loads, against which there has been a consumption of 4,315 loads. These figures are exclusive of the imports of logs and conversions from Java, of which the high rates for Burmah and Siam wood have encouraged an increased importation. The landings of 1,767 loads during the past half-year compare with 545 loads landed for the corresponding six months of 1905; but the consumption has not grown in proportion, being only 1,262 loads as against 1,054 loads for the same period. The want of length and the inferiority of conversion are largely responsible for the difficulty in selling this production.

Messrs. C. Leary & Co. give the following quotations according to specification:—Timber, £12 10s. to £19; flitches, £16 to £20; planks, £13 10s. to £19 10s. per load, on c.i.f. terms.

Mahogany.—This market has been a restricted one all through the half-year, owing to very modest imports. Prices, however, have varied but little, owing to the equally modest consumption. These conditions have served to make a safe, but at the same time very dull market, and so far as forward supplies can be gauged, it seems likely that the rest of the year will see no startling fluctuation in prices, although they should tend upwards, even if the present rate of consumption should continue.

Walnut.—In American black, prime sizeable logs sell readily, but the demand for Italian and French is very quiet.

Abstract of Stock, Consumption, &c., in London Docks, for June.

All Docks.	Deals (Fir).	Battens (Fir).	Pine.	Spruce.	Pitch-pine Deals.	Deals and Battens in Aggregate.	Rough Boards (All Countries).	Flooring.	Floated Timber.
	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Pieces	Pieces.	Pieces.	Loads.
Public dock stock - - -	704,803	1,263,340	540,400	439,521	11,383	2,959,447	2,487,726	5,243,509	20,500
Monthly public dock consumption - - - -	171,524	358,098	79,845	89,543	2,979	701,989	288,866	1,040,353	3,612
Overside stock - - -	58,318	121.753	27,147	30,445	—	237,663	98,214	52,018	—
Overside consumption (estimated of dock):—									
98 per cent. Sawn 63 ,, Planed	168,094	350,936	78,248	87,752	—	685,030	283,089	655,422	—
Duration of supply at same rate of consumption - -	2.25 months.	1.95 months.	3.59 months.	2.65 months.	3.82 months.	2.31 months.	4.52 months.	3.12 months.	5.68 months.

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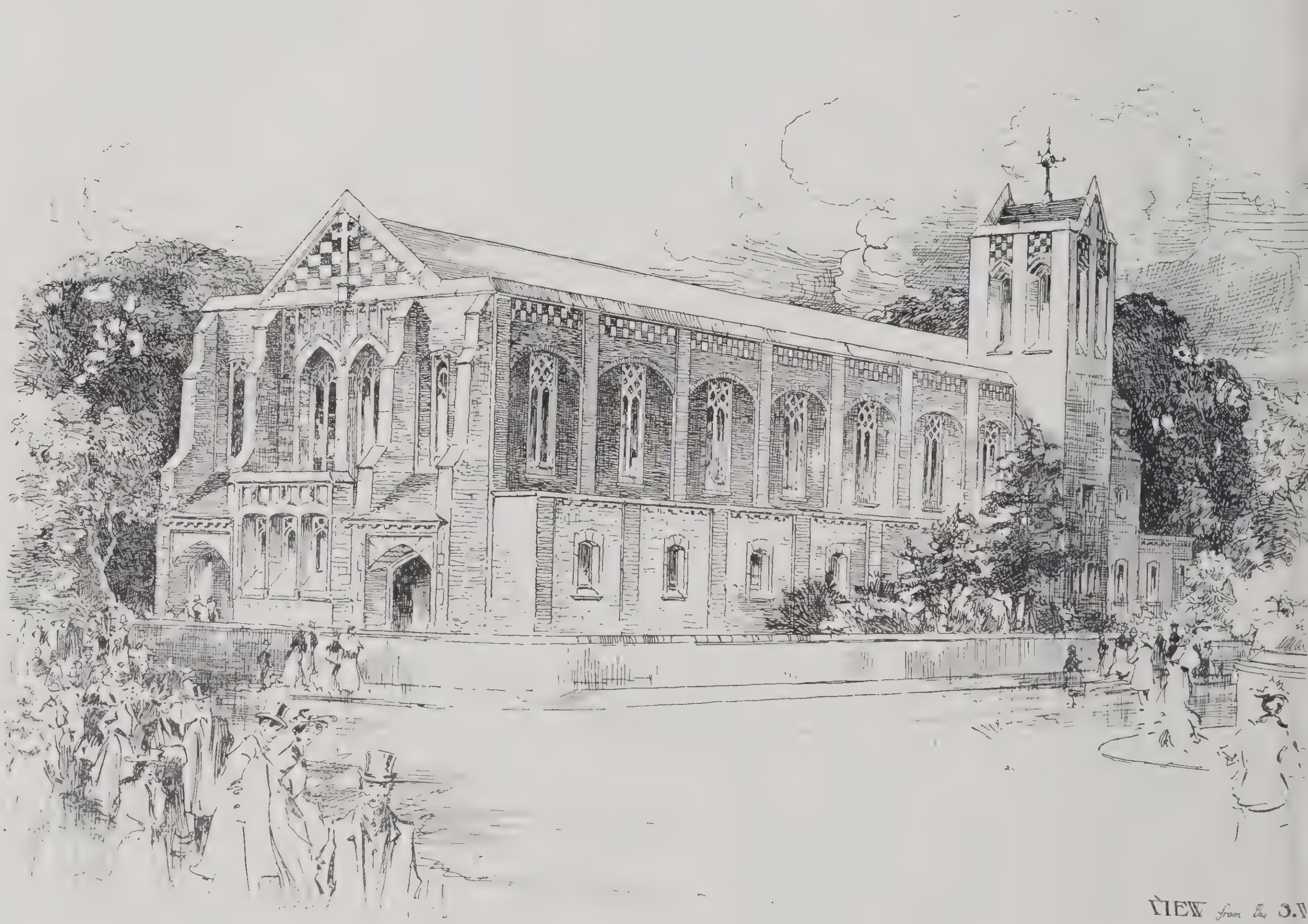
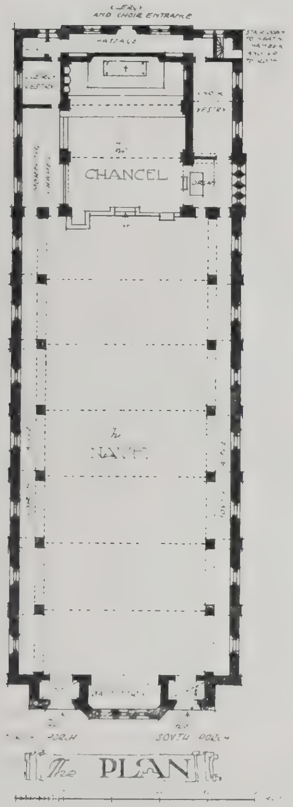
Supplement to
THE BUILDERS' JOURNAL AND ARCHITECTURAL ENGINEER,
Wednesday, July 11th, 1906.



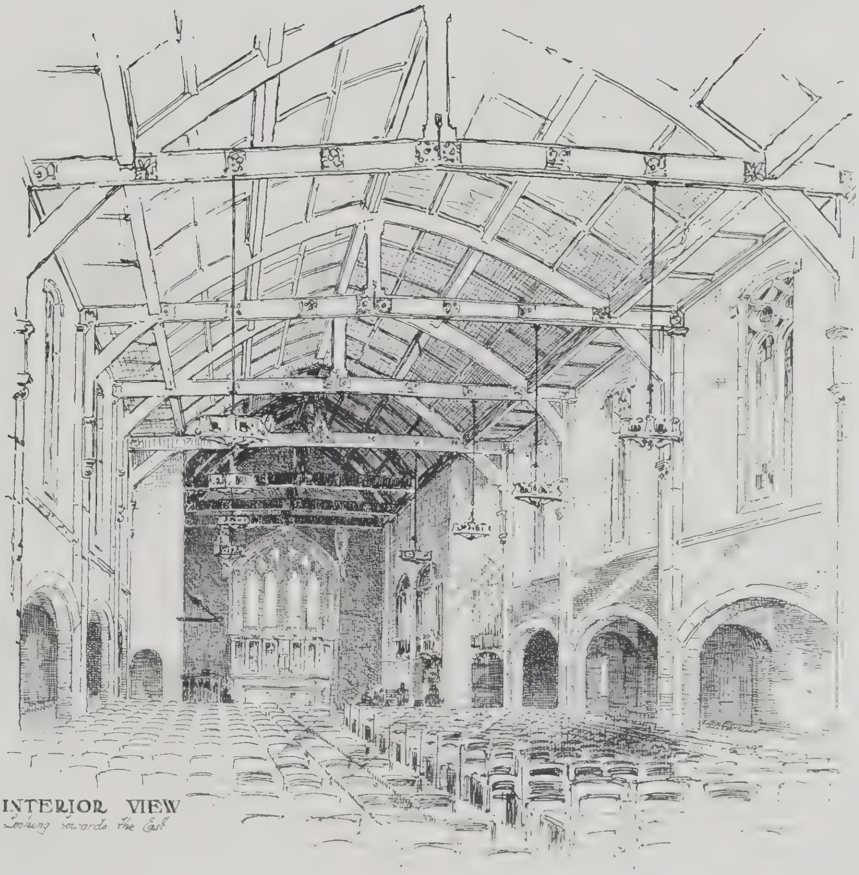
VIEW *from the* S.

SKETCH DESIGN
for the
CHURCH *of* ST JAMES HILL NEAR SUTTON

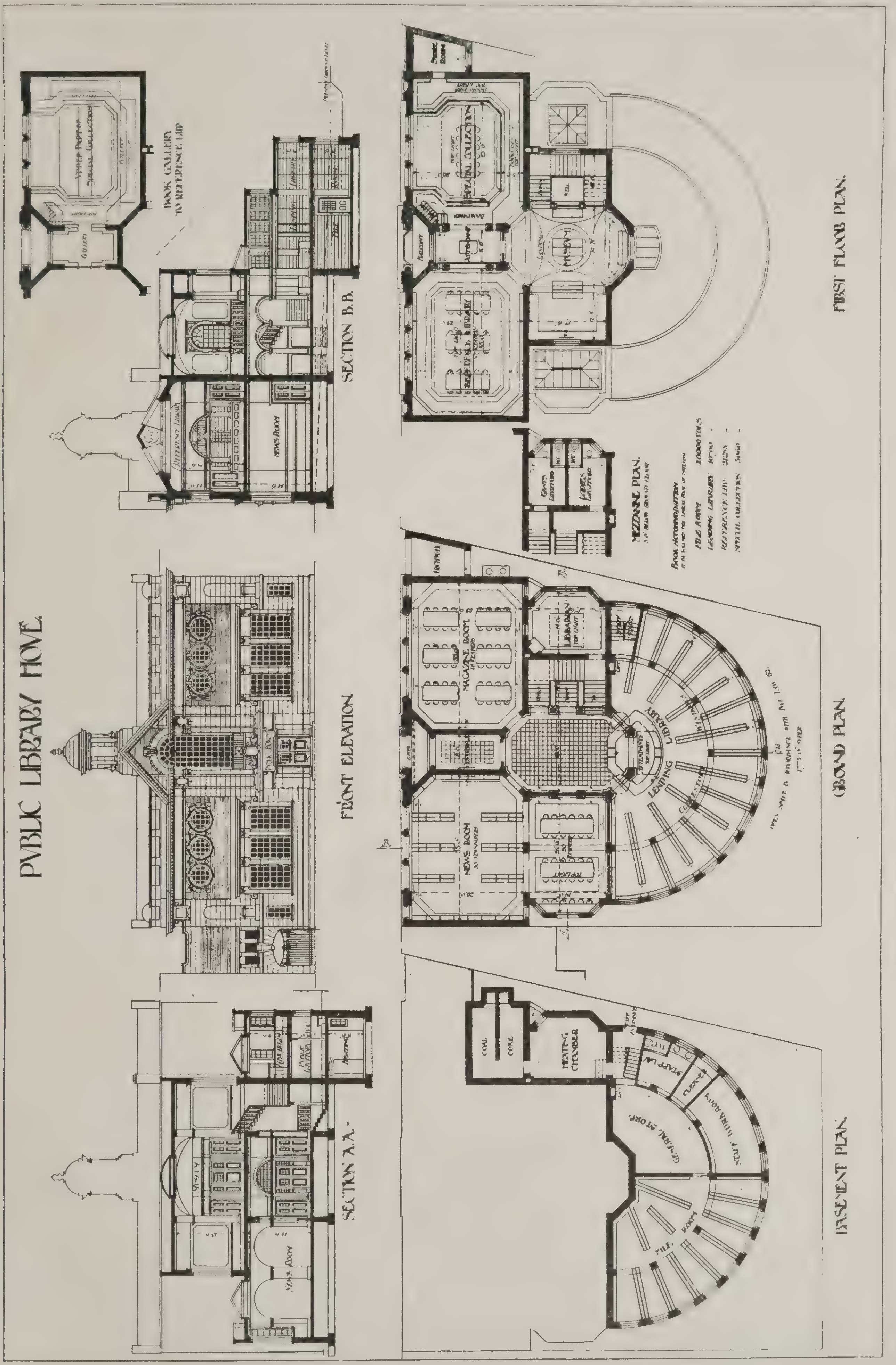
Buckland & Haywood-Farmer
Architects
25 A Paradise Street
BIRMINGHAM



The PLAN



INTERIOR VIEW
Looking towards the East



SELECTED DESIGN. PERCY ROBINSON and W. ALBAN JONES, JOINT ARCHITECTS.

Notes on Competitions

Norwich Shirehouse.

Should the successful competitor have been disqualified? It is perhaps somewhat late in the day to raise such a question, the working drawings having been completed and a contractor's estimate provisionally accepted; but the recent published announcement of the latter fact having awakened bitter memories and provoked an outburst of correspondence upon a somewhat contentious point, the subject would appear to merit consideration at this stage in spite of the reticence we always feel about commenting upon an award that has been confirmed and the architect duly appointed to carry out his scheme. In our issue of January 17th last we commented upon the discrepancy between the architect's estimate for his scheme submitted in competition and placed first by the assessor, and the assessor's estimate. The figures were £8,850 and £13,820 respectively. The original conditions required that each competitor should forward with his designs a tender from a reliable contractor, undertaking to carry out the works specified. What we did not know then, but what we have learned since, was, that this clause had been modified, no doubt in consequence of protests which had been made, so that a contractor's estimate was not required, but only a bona-fide one from the architect himself. The estimate of £8,850, therefore, was the bona-fide estimate of the author of the design placed first. The estimate of the author of the design placed second amounted to £13,210 and the assessor's estimate for this scheme was £13,640. Here is the bone of contention—the discrepancy between the estimates for the respective schemes. Assuming that the best design was placed first, ought not the obviously inadequate estimate which accompanied it to have placed it outside the pale of recognition and left the ground clear for an inferior design, but one the cost of which had been accurately stated? The inadequacy of the first amount has been confirmed by the published list of tenders, the lowest of which was £12,240. In considering the case it is very important to bear in mind that the revised conditions contained no clause that the successful competitor would be disqualified if the contractor's estimate exceeded the architect's by a certain percentage. Moreover, the assessor, by his conscientious computation of the probable cost of each design, was able to place such information before the promoters as would enable them to arrive at a decision without difficulty. It has been argued that they were influenced in their decision by the lowness of the estimate for the design they selected. This is hardly probable in view of the assessor's figures, which are not likely to have been ignored. One can imagine the deliberations of the assessing committee resolving themselves in some such consideration as this:—"Here is a design which our architect adviser has placed first in order of merit and which he considers can be erected for a sum which appears to be an average one for the building we require. True that the author of the design has seriously under-estimated the cost, but are we on that account to reject it and accept an inferior design which will cost us, if erected, an approximately identical amount?" If this can be accepted as a reasonable hypothesis, and if it be weighed up with the fact of the absence of a penalizing clause as to cost, then surely the deduction must be that the committee acted, through their selection of the design placed first by the assessor, in the best interests of themselves, those they represent, and, we venture to think, the competitors themselves. The ground is further cleared by reason of there being no limit of cost in the conditions. Had a sum been stated, the issue would have been a very different one. Again, could it be shown that the successful competitor was actuated by the intention of deceiving the promoters in the matter of cost, the case would present another aspect, but as there are few architects who are able to say that they have never made a mistake in estimating, and as the danger of doing so is especially great in matters of this kind, particularly with young competitors, it is only fair to take a charitable view of the case, and at the very least give the fortunate competitor the benefit of the doubt. This question of estimated cost is always a difficult one, for competitors are notorious for taking the most sanguine view of the amount for which their schemes can be carried out. They are influenced by the double desire of producing a fine building at a low cost, and are apt to overlook the current rates of labour and materials, and that their dados and floors are of marble, where in a former instance cement and wood had to serve the purpose. Where a limit of cost is put upon the building the question is one which, of course, should affect the award most materially, for any laxity in the consideration of the estimates by the assessor must act to the detriment of the competitor who has struggled to produce a building within the stated amount. Where there is no limit the case is a different one, and where, as in the present case, the three premiated designs are all valued by the assessor at sums within a few hundred pounds of one another, there cannot be much wrong in the best design being selected.

Dublin Technical Schools.

The question of the architect for the new technical schools to be built in Bolton Street, Dublin, came up for discussion again at the last meeting of the Dublin Municipal Council. A request was brought forward by the Technical Education Committee that competitive designs should be invited for the building, but this was rejected, and the decision come to that the city architect should be given the work. Alderman Irwin protested against "£2,000 of public money being expended upon an outside architect, while the corporation had in their employment an architect as competent as any one that they could select. The question of the architect was not the most important; the real question was, when was the work to be begun?"

Free Library, Caversham.

The first premium (£20) in this competition has been awarded to Mr. W. G. Lewton, and the second (£10) to Mr. W. G. A. Hambling, both of Reading. The building is to cost £1,600.

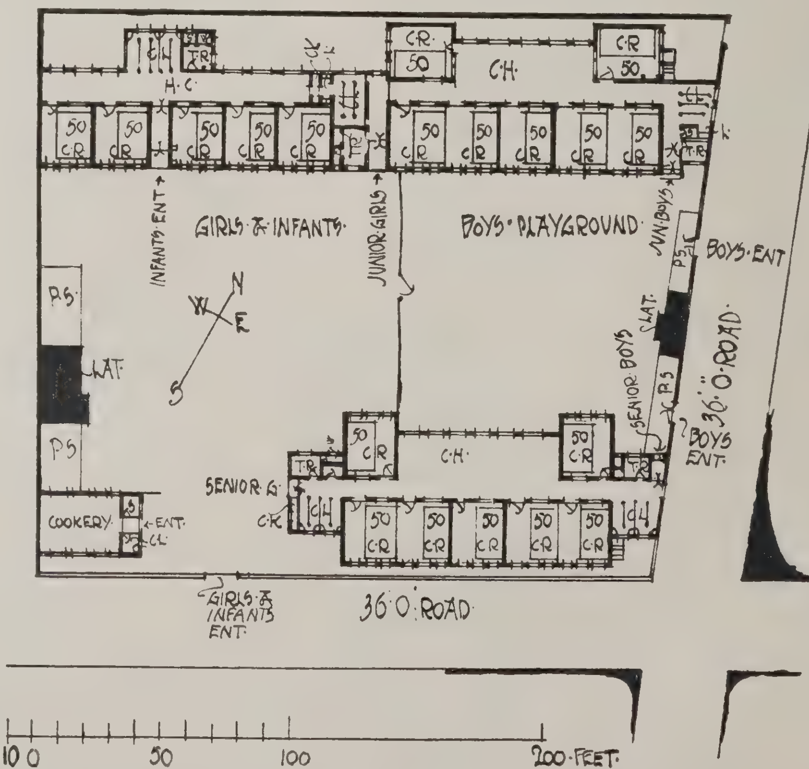
Holborn Borough Offices.

From the designs submitted by the six invited architects in this competition the Establishment Committee of the Holborn Borough Council have chosen design No. 1 for the proposed new offices for the borough, and will recommend that design to the council. It is estimated to cost £19,205.

Durham County Schools, Southmoor.

In the competition for these schools, held by the Durham County Education Committee, forty-one designs have been submitted.

The accommodation is for 350 senior mixed, 350 junior mixed, and 250 infants, each in separate departments, with a cookery classroom for 36 at demonstration and 18 at practice. The cost had not to exceed



C.R.—Classroom. C. H.—Central Hall. H.C.—Hall Corridor. CL.—Cloaks. CK.—Caretaker. T.R.—Teachers' Room. S.—Store. W.—Closet. P.S.—Playshed.

DURHAM COUNTY SCHOOLS, SOUTHMOOR. PLAN OF SELECTED DESIGN. CLARK & MOSCROP, ARCHITECTS.

£10 per head, with an extra allowance of 15s. per ft. super. for central halls, marching corridor and cookery room.

The authors of the first-premiated design are Messrs. Clark and Moscrop, architects, of Darlington, whose alternative set is also placed second; the third-premiated design being by Messrs. Liddle & Brown, of Newcastle-on-Tyne. The selected design shows classrooms divided for fifty scholars. The senior mixed block is the best of the three, because here the authors have not been handicapped in arranging the entrances by the width of the site, as they have in the other departments. The lavatory accommodation is poor, and the teachers' room has only partial inspection of the boys' playground. If there is much traffic on the adjoining roads it will cause a serious annoyance.

The details of the entrances in the junior mixed school, and especially in the infants' school, are not commendable. Indeed, in the last the effort to obtain south light is painful; and the hall-corridor is unnecessarily long and its area in excess of all requirements. The elevations are treated simply with Elizabethan gables. The estimated cost is £10,425, the main building cubing at 5½d. and the latrines at 3d.

Broadly, the second-premiated design is a repetition of the first, and whilst it contains improvements in several details it loses advantages in others. The elevations are differently treated.

The third-premiated is a good scheme; as also are several others not placed.

Some competitors have allowed for future extensions, and have indicated the same upon their plans. The selected design shows none. Three weeks before the stipulated time when designs had to be delivered, a circular was issued stating that the committee would give preference to designs capable of easy extension. And those architects who took this intimation seriously have made laborious attempts to meet it and necessarily sacrificed their designs in other ways. It must be a source of disappointment and dissatisfaction to such competitors, because, in the end, future extensions do not seem to be at all required.

The committee did not appoint an assessor, and, as previous remarks in this journal implied, representations for the appointment of an assessor were made. But with no result. And though it was locally understood that the committee would be guided in their selection by the advice of their own architect (Mr. W. Rushforth, F.R.I.B.A.), the clause that "the committee will select the plans which, in their judgment, will best meet their needs, and their decision shall be final and binding on all competitors," cannot by any means be called a satisfactory one.

We are informed that in the report on the designs which Mr. Rushforth drew up for the Education Committee one of the designs of Messrs. Clark and Moscrop was placed fourth in order of merit, whilst the other was not mentioned at all; and that of Messrs. Liddle & Brown was placed fifth. The sub-committee, consisting of four members, ignored Mr. Rushforth's report and selected the designs they themselves preferred.

Grenoside Parsonage.

A new parsonage house at Grenoside is to be erected. Seven architects submitted designs, and Messrs. R. & W. Dixon, of Barnsley, were the successful competitors. The contractor is Mr. C. W. Squire.

Hove Library.

We publish in this issue the selected design in the competition for the new public library to be built at Hove, the successful architects being Messrs. Percy Robinson and W. Alban Jones, of 53, Albion Street, Leeds. It will be recollected that this is the second competition for the building, the first having been unsatisfactory, Mr. Belcher, the assessor, not being able to recommend the adoption of any of the seventy-one designs submitted. In the second competition ten architects in the first were invited to send designs. Considerable restriction was imposed by reason of the requirement of a local by-law that there should be an air-space of at least 25ft. in the rear. The first-premiated design is estimated to cost £9,333. There is no necessity for any detailed description of the arrangement, as the plans clearly show this. The second premium (£30) has been awarded to Messrs. A. J. Hardwick and Sydney E. Castle, of Eagle Chambers, Kingston-on-Thames, and the third premium (£20) to Mr. Lionel U. Grace, of 30, John Street, Bedford Row, W.C.

Bangor College Buildings.

At last week's meeting of the Carnarvonshire County Council a wrangle took place in connection with the following resolution of the Council of the University College of North Wales, Bangor:—"That the Council, while thanking the Carnarvonshire County Council for its resolution in support of the application of the Welsh University Colleges for increased Treasury grants, desires to express its surprise and regret that a further resolution should have been adopted reflecting upon the action of the College in connection with the selection of architects for the new buildings. The statement that the conditions of the competition were such as to debar Welshmen from submitting designs is entirely without foundation. They regret that the County Council should have endorsed it without satisfying itself as to its accuracy by enquiry from official sources."

Henshaw's Asylum, Manchester.

In connection with the competition among Manchester architects for the proposed rebuilding of Henshaw's Blind Asylum at Old Trafford (for which Mr. John Holden, F.R.I.B.A., of Manchester, is the assessor) we notice several letters in the *Manchester Guardian.* A correspondent signing himself "Ratepayer" says: "Every architect, when applying for the printed instructions, must pay a deposit of a guinea. This is a condition which only puts the committee to unneccessary trouble, as all architects, who in this case are limited to those practising in Manchester, are known by name and their addresses can be verified by reference to the directory if necessary. The Preston Corporation recently organised a most successful competition for large schools, and issued instructions without asking for any deposit, thus saving both themselves and competitors considerable trouble. Nothing is gained by the condition; it is merely an old custom for which there is no reason, as the printed competition instructions need not be sent to anyone not actually practising within a specified district. The Manchester and Liverpool Corporations both adhere to the antiquated system. No reason can be suggested why they should not follow the lead of Preston."

"Architect" writes:—"Competing architects will no doubt be glad that the Board have taken the very proper step of appointing an assessor and of publishing his name; but I would suggest that it would have been far better to have appointed some architect not practising in the neighbourhood to decide on the merits of schemes submitted by local architects. . . "

"F.R.I.B.A." writes:—"Contractors and traders are usually asked to deposit an amount, to be returned on receipt of a tender, for the particulars necessary to enable them to estimate, because proprietors find that they have many more applications for particulars than they receive tenders. . . . But in the case of architects, to charge them for particulars of a competition is positively ludicrous when one considers that the designs they send in often cost them a hundredfold the cost which promoters incur upon premiums, advertising, and printing put together. Most architects who ask for particulars mean business if they find the particulars fair and reasonable. It would be going quite far enough if architects of recognised professional standing were furnished with particulars gratuitously, with a request that if they should decide not to compete they would return the instructions furnished within fourteen days of their receipt. Promoters themselves would gain by abandoning the present practice, because they would induce many designers seriously to consider their competitions who will not risk the possibility of being asked to pay for something which may contain conditions so utterly impracticable or unjust that they would feel justified in declining to use them when obtained."

Carnegie Free Library, Annfield Plain.

Thirteen designs have been submitted in competition for this building, and the design of Mr. Edward Cratney, of Rose Hill, Willington-on-Tyne, has been accepted.

Baths, Fire Station and Library at Reddish.

Twenty-six designs were submitted in competition for public baths, fire station and library proposed to be erected in Reddish. The assessor, Mr. A. Brumwell Thomas, F.R.I.B.A., of London, has awarded the first premium to design No. 15, by Messrs. A. E. Dixon and C. H. Potter, of 65, King Street, Manchester; the second premium to design No. 2, by Mr. J. Myrtle Smith, of 8, Trafalgar Square, Chelsea; and the third premium to design No. 20, by Messrs. Shewbrooks & Hodges, of 24, Grainger Street West, Newcastle-on-Tyne. Cost was a governing factor in the competition, so that the cubical contents have been kept down as much as possible. The cost of the first-premiated design is put as follows: Baths, £2,784; fire station, £1,160; library, £1,110; total £5,054.

Competitions Open.

The following is a list of competitions open:—

DATE OF DELIVERY	COMPETITION.
July 13	NEW SECONDARY SCHOOL AT MEXBOROUGH, ROTHERHAM. Uncoloured sketch plans for building to cost £8,000 (300 pupils). Limited to architects practising within 35 miles of Mexborough. Names by July 13th to J. W. Hattersley, Secretary to Governors of School, Mexborough.
Sept. 29	REBUILDING OF HENSHAW'S BLIND ASYLUM AT MANCHESTER. Limited to Manchester architects. Premiums £100, £50, and £25. Assessor, Mr. John Holden, F.R.I.B.A.
Oct. 1	ALPHABET COMPETITION. Prizes of £20, £10 and £5. For particulars see "Architectural Review."

Complete List of Contracts Open.

WITH a few exceptions, news of Contracts Open are not repeated after they have been published once in these columns, so that readers will find particulars in our previous issues of other contracts that still remain open.

Unless expressly stated to the contrary, all deposits required for bills of quantities, &c., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair-wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

July 12. Lincoln.—*Pulling down and re-building a warehouse* in St. Swithin's Square, Lincoln, for W. K. Merton & Sons, Ltd. Full particulars may be had on application to Scorer & Gamble, architects, Bank Street, Lincoln, on or before July 12.

July 12. Llanerchymedd.—*Additions and alterations* to the Council school, together with new infants' school, out-offices, boundary walls, &c. Plans and specifications may be inspected at the Llanerchymedd Council School, and at the office of J. Owen, F.R.I.B.A., county architect, Menai Bridge. Tenders, endorsed "Llanerchymedd School," (on forms which will be supplied by the architect), to be delivered to R. H. Williams, secretary of education, Education Offices, Llangefni, not later than 10 a.m. on July 12.

July 12. London, S.E.—*Re-pointing and external painting* at Melvin Road School, Penge, S E. The specification may be seen and forms of tender obtained on payment of £1 1s. at the offices of the surveyor to the Committee, H. W. Longdin, Town Hall, Anerley, S.E. Sealed tenders, endorsed "Tender for Re-pointing and Painting Melvin Road School," to be sent to C. Gordon Liddie, clerk to the Committee, the Court House, Anerley, S.E. by noon on July 12.

July 12. Wareham.—*Repairs and alterations* at the Workhouse. Specifications and particulars can be seen at the offices of W. W. Fookes, architect and surveyor, Wareham. Sealed tenders, endorsed "Tenders for Workhouse Repairs," to be sent to E. S. Clark, clerk, Union Offices, Wareham, not later than 10 a.m. on July 12.

July 13. Cork.—*Building and erecting new concert hall and executing sundry alterations to school of music*, Union Quay, Cork, in strict accordance with the specification, conditions and drawings prepared by the City Engineer. General conditions, specification, and drawings can be seen in the City Engineer's Office, Municipal Buildings, from 10 to 4 o'clock daily, where tender forms will be issued. Intending contractors must first lodge with the city treasurer the sum of £2. Tenders on any other forms than those issued from the City Engineer's Office will not be considered. Fair wages clause. Sealed proposals endorsed "Tender for Building Concert Hall, &c., School of Music," must be deposited with F. W. M'Carthy, town clerk, Municipal Buildings, before 2 p.m. on July 13.

July 13. New Mills.—*Erection of a new boardroom* at the Workhouse, New Mills. Bills of quantities can be obtained, and plans and specifications inspected at the office of A. Walker, clerk to the Guardians of the Hayfield Union, Spring Bank, New Mills, to whom tenders must be delivered by July 13.

July 13. Norwich.—*Enlargement of Great Dunham School.* Builders desirous of tendering should send in their names to the Secretary, Norfolk Education Committee, 57, London Street, Norwich, at which office plans and specifications can be inspected and bills of quantities obtained. A deposit of £1 1s. will be required. Tenders must be delivered by noon on July 13, addressed to "The Secretary," at the above address, and endorsed "Tender for Great Dunham School."

July 13. Lochgelly. — *Mason, Joiner, and Plumber Work of Public Convenience* to be erected in Knockhill Close. Specifications may be seen in the hands of the Burgh Surveyor, and Sealed Offers, marked "Public Convenience," are to be lodged with R. Small, town clerk, Burgh Office, Lochgelly, not later than July 13.

July 13. Dunfermline.—*Proposed Latrines*, &c., at Limekilns School, for the Dunfermline Parish School Board. Plans seen and Schedule of Measurements obtained on application to J. Houston, architect and surveyor, St. Margaret Street, Dunfermline, with whom sealed offers are to be lodged not later than July 13, by 10 a.m.

July 14. Blackpool.—*For the whole of the work in the erection of a lecture hall* at Claremont Congregational Church, Blackpool; also separate tenders for the various trades. Bills of quantities and other particulars may be obtained and plans inspected at the offices of the joint architects, Walter Wade, Bank Chambers, St. Anne's-on-Sea, and William Fielding, 12, Birley Street, Blackpool. Tenders, sealed, and endorsed "Tender for New Lecture Hall," must be addressed to the chairman, Rev. A. H. Boyden, B.A., B.Sc., 22, Clevedon Road, Blackpool, and delivered not later than July 14.

July 14. Manchester.—*Erection of a manager's house* at the Withington Sewage Works, Chorlton-cum-Hardy. Drawings may be inspected and bills of quantities and tender forms may be obtained on application to the secretary of the Rivers Department, Town Hall, Manchester. Tenders must be enclosed in the official envelope provided expressly for the purpose (otherwise the tender will not be considered), and delivered at the above office not later than 10 a.m. on July 14.

July 14. Scilly Banks.—*Erection and completion of two dwelling-houses* at Scilly Banks. Plans and specifications can be seen at the Lowther Arms Inn, Scilly Banks, near Whitehaven. Separate Tenders will be received up to July 14 by W. Carmichael, architect, Parton, near Whitehaven.

July 14. Wakefield.—*For the following works* for the West Riding Education Committee:—Erection of new school at Thorpe, Rothwell (builder, joiner, slater, plumber, plasterer, painter). Erection of new school at Bailiff Bridge, Hipperholme (builder, joiner. slater, plumber, plasterer, painter, concretor). Bilbrough Provided School—alterations (builder, joiner. plumber, plasterer, painter). Plans may be seen and quantities obtained on application to the County Hall. A deposit of £1 is required for each of the two first mentioned. Cheques to be sent to the West Riding Treasurer, County Hall, Wakefield. Sealed tenders, properly endorsed, to be sent to J. Vickers-Edwards, county architect, County Hall, Wakefield, not later than 10.30 a.m. on July 14.

July 16. Alfreton.—*School for 400 infants at Alfreton.* Tenders to be delivered not later than July 16. Quantities will be supplied on application to Percy B. Houfton, architect, Chesterfield.

July 16. Beckenham.—*Erection of extensions* to and the modernisation of the existing boys', girls' and infants' departments of the public elementary schools, Bromley Road, Beckenham, for the U.D.C. Drawings may be seen and bills of quantities, and forms of tender obtained on application to John A. Angell, surveyor, on the production of a receipt from the collector (who attends his office daily from 9 to 10 only, except on Tuesdays, when his hours are from 9 to 1) for a deposit of £5. Fair wages clause. Tenders, duly sealed and endorsed "Tenders for Bromley Road Schools," to reach F. Stevens, clerk of the Council, Beckenham, not later than 4 p.m. on July 16.

July 16. Cleckheaton.—*Mill, &c.* For the various works required in erection of a four-story mill and offices at Prospect Mill, Cleckheaton, for Critchley, Sharp & Tetlow. Plans may be seen and bills of quantities obtained at the offices of Howorth & Howorth, architects, surveyors, &c., Old Bank Chambers, Cleckheaton, up to July 16. Sealed and endorsed tenders to be sent to the Architects by noon on July 16.

July 16. Denmead.—*Additional window to class-room, ventilation, external and internal repairs, and internal painting* to the school. Persons desirous of tendering may see plans and conditions of contract and obtain specification at the office of W. J. Taylor, county surveyor, The Castle, Winchester, between 9 a.m. and 5 p.m. (Saturdays, 9 a.m. and 1 p m.) Plans and conditions of contract may also be seen at the School. A deposit of £1 1s. will be required for a copy of the specification. Deposits must be made by cheque, payable to Hants County Council, and crossed Bank of England, or particulars will not be sent. Tenders, endorsed "Proposed Work, Denmead Council School," are to be delivered to H. Barber, Clerk to the County Council, The Castle, Winchester, by 10 a.m. on Julv 16.

July 16. Greenock.—*Structural and other work* required for the installation of a Refuse Destructor and Electric Generating works required to be erected on the site known as No. 2, Millstead Dwelling, Burn Square, Greenock, for the Electricity Dept. The work is divided as follows:—Specification 26, Buildings, &c., Contract (*a*), Excavator, Brick and Mason's Work; Contract (*b*), Carpenter's Work and Roof Glazing; Contract (*c*), Structural Steel Work; Contract (*d*), Slater's Work; Contract (*e*), Tile Work. Specifications, schedules and forms of tender can be obtained on application to J. A. Robinson, Brush Electrical Engineer, on payment of a deposit of 5s. for each specification. The drawings may be inspected at the office of the department between 9 a.m. and 12.30 p.m. Tenders enclosed in a sealed envelope clearly marked with the number of the Contracts being tendered for, to be lodged with Colin MacCulloch, town clerk, Municipal Buildings, Greenock, not later than 10 a.m. on July 16.

July 16. London, W.—*Erection of new school*, Drayton Green, West Ealing. The drawings and specification may be seen, and forms of tender, together with bills of quantities and other particulars, may be obtained from Charles Jones, M.I.C.E., borough engineer, Town Hall, Ealing, W., any day during office hours, upon payment of a deposit of £5 5s. Sealed tenders, in the envelopes provided, endorsed "Tender for New School, Drayton Green," must be delivered at the office of J. B. Johnson, secretary, Education Office, Town Hall, Ealing, W., not later than noon on July 16.

July 16. Southampton.—*Erection of cook's bedroom* at the Union Workhouse, West-end, Southampton, in accordance with the plan, specification, and conditions of contract prepared by W. H. Mitchell, Son and Gutteridge, architects, of 9, Portland Street, Southampton. The plans, &c,, may now be seen, and all particulars obtained at the offices of the architects. Sealed tenders, on the form provided, are to be sent to E. T. Westlake, 20, Portland Street, Southampton, not later than 12 noon on July 16, endorsed "Tender for Cook's Bedroom."

July 16. Senghenydd.—*Erection of twenty dwelling-houses* at Senghenydd for the trustees of the Gwernymilwr Building Club. Plans and specification may be seen with G. L. Watkins, architect, Rectory-road, Caerphilly. Sealed and endorsed tenders to be delivered to the secretary, R. Humphreys, 131, Commercial Street, Senghenydd, on or before 12 o'clock noon, July 16.

July 16. Windermere.—*Erecting a gymnasium* at the Windermere Grammar School. Plans may be seen, and quantities obtained, of J. Pattinson, architect, Windermere. Tenders to be sent not later than July 16.

July 17. Edmonton.—*Alterations and additions* to the Brettenham Road School, together with the annual cleansing and repairs at their Brettenham Road and Croyland Road Schools. Fair wages clause. Tenders must be delivered to John Moule, secretary, Education Offices, Brettenham Road, Upper Edmonton, on or before noon on July 17.

July 17. Llancadle.—*Re-seating, &c.*, St. Athan Calvinistic Methodist Chapel, for the trustees. Plans and specifications may be seen with the Rev. D. Wynne Rees, Llancadle. Sealed and endorsed tenders to be sent to the Rev. D. Wynne Rees, The Manse, Llancadle, near Cardiff, on or before 5 p.m. on July 17.

July 17. London, E.C.—*Erection of a dwelling-house* at No. 80, Upper Thames Street, E.C. Drawings and specification may be seen at the Office of the City Engineer, Guildhall, between 10 a.m. and 5 p.m., where bills of quantities and forms of tender may be obtained on payment of £3 3s. Tenders must be addressed to the Town Clerk, Public Health Department, Guildhall, E.C., endorsed "Tender for Dwelling-House," and delivered at the Office of the Hallkeeper, Guildhall, between 12.30 and 1.30 on July 17.

July 17. Rochester.—*Pulling down and removal of certain houses* in High Street, Strood Intra. Particulars and conditions of contract and form of tender can be obtained of William Banks, A.M.I.C.E., city surveyor, Rochester. Tenders are to be delivered at the Town Clerk's Office before 4 p.m. on July 17.

July 17. Treherbert.—*Alterations to the front of the Conservative Club*, Treherbert. Plans and specifications can be obtained by applying to the Secretary, or J. Rees, architect, Pentre. All tenders to be in the hands of secretary by Tuesday, July 17.

July 17. Llanwrtyd Wells.—*Erection of new Calvanistic Methodist Chapel*, Llanwrtyd Wells. Plans and Specification may be seen with the Rev. Rhys Evans, Chapel House, Llanwrtyd Wells, and at the offices of W. Beddoe Rees, architect, 3, Dumfries Place, Cardiff, from whom Bills of Quantities may be obtained. Tenders to be sent to Rev. Rhys Evans, on or before July 17.

July 17. Edinburgh.—*Reconstruction of Tenements, Greenside Row*, conforming to plans, specification, and schedules of measurements prepared by the Burgh engineer, from whom schedules of quantities and all particulars may be obtained. Sealed offers, endorsed "Tender for Reconstruction, Greenside Row," must be lodged not later than July 17.

July 18. Dublin.—*Temporary dining hall at the R.I.C. Depôt*, Phœnix Park, Dublin. The plans and specifications can be seen with H. Williams, Office of Public Works, Dublin, where also Forms of Tender may be obtained. The envelope containing the Tender must be endorsed and be sent in to the Office of Public Works not later than 10 a.m. on July 18.

July 18. Teddington.—*Additional offices at Elmfield House, Teddington*, for the Urban District Council. Plan and specification may be seen on application to M. Hainsworth, surveyor, Council Offices, Teddington. Tenders, endorsed "Offices," must be sent to G. H. Salmons, Elmfield House, Teddington, not later than July 18.

July 19. Cultra.—*Erection of a dwelling-house* near Cultra Railway Station. Plans and specification may be seen and copies of the bill of quantities obtained at the office of Graeme-Watt & Tulloch, architects, 77A, Victoria Street, Belfast, on payment of a deposit of £1 1s., which will be returned to those contractors who submit a bona fide tender. Sealed and endorsed tenders to be delivered at the above office not later than 10 a.m. on July 19.

July 19. Somerset.—*Erection of a bungalow residence*, on the Crowcombe estate, Somerset, for G. Connock Dyke. Plans and specification may be seen Crowcombe station, on application to John A. Tozer: and further particulars from G. C. Strawbridge, architect, 25, Alma Street, Taunton. Tenders to be delivered to G. C: Strawbridge or or before July 19.

July 20. Stretford.—*Erection of twenty pairs of semi-detached cottages* in Lacy Street, Stretford, for the Urban District Council. Plans, form of tender, &c., may be seen, and bills of quantities obtained, at the offices of John Bowden & Co., architects, 14, Ridgefield, Manchester, upon payment of £1. Tenders to be sent to the Chairman, Sanitary Committee, at the Council Offices, Old Trafford, on or before July 20, endorsed "Tender for Cottages."

July 21st. Heath Town.—*Erection of new infants' department at Woden Road Council School, Heath Town.* Builders desiring to Tender for the work should apply to G. Balfour on or before July 2. Quantities will be supplied upon a deposit of £1 1s. being made. The drawings and specification can be seen at the County Education Offices, Stafford.

July 21. Inchlea.—The Directors invite Tenders for the *Mason, Carpenter, Slater, Plaster, Plumber, Painter, and erection of a block of three houses* for workmen at Inchlea Crossing Loop, between Newtonmore and Dalwhinnie Railway Stations, for the Highland Railway Co. Plans and Specifications may be seen with Mr. William Roberts, Company's engineer-in-chief, at Inverness, or with the Station Agent at Kingussie. Sealed Tenders, addressed to Robert Park, secretary, The Highland Railway Co.'s Office, Inverness, and marked on the outside, "Houses, Inchlea," to be lodged by July 21.

July 21. Maesteg.—*Alterations and additions to Bethel English Baptist Chapel*, Maesteg. Plans and specifications may be seen with the Rev. R. Davies, Rhiaufa, St. Michael's Road, Maesteg. Sealed and endorsed Tenders to be delivered to G. Griffiths, Hon. sec., St. Michael's Road, Maesteg, on or before July 21.

July 21. Guildford.—(a) *The construction of a small store, external shelter and a pent roof* in connection with the new casuals block, and (b) external painting at the Infirmary Buildings, both at the Union Workhouse, Guildford. Specifications and plans of the proposed work can be seen on application to Edward L. Lunn, architect, 36, High Street, Guildford. Sealed tenders, endorsed "Building Work at Casual Block" and "Painting Infirmary," are to be sent to W. S. V. Cullerne, Union Offices, Commercial Road, Guildford, not later than 10 o'clock a.m. on July 21.

July 21. New Hey.—In connection with Sewage Works at New Hey, the Crompton U.D.C. solicit tenders for the following: Contract No. 1.—Erection of Buildings for sludge-pressing machinery and other works in connection therewith. Contract No. 2.—Supply and Installation of Suction Gas Producer Plant, gas engine pump, air compresser and receiver, water tanks, and all shafting, piping, &c. in connection therewith. Contract No. 3.—Supply and Installation of Sludge Press, dams, mixer, cast-iron overhead sludge tank, and all piping, &c. in connection therewith. Plans, specifications, and general conditions may be seen and forms of tender, with all necessary information, obtained on application to J. P. Wilkinson, M.Inst.C.E., Council's engineer, 301-304, Cathedral Street, Manchester, accompanied by a deposit of £1 1s. Sealed tenders, endorsed "New Hey Sewage Works—Contract No. —" (as the case may be), must be addressed to F. F. Gartside, clerk to the Council, Town Hall, Shaw, near Oldham, and be delivered at this office not later than 10 a.m. on July 21.

July 23. Fawley.—*External painting, alterations to offices, erection of new lavatories and cloakrooms, drainage, new offices, heating, ventilation, &c.*, at the school. Builders desirous of tendering may see plans and conditions of Contract, and obtain specification at the Office of W. J. Taylor, county surveyor, The Castle, Winchester, on and after July 9, between the hours of 9 a.m. and 5 p.m., Saturdays, 9 a.m. and 1 p.m. Plans and conditions of contract may also be seen at the school. A deposit of £1 1s. will be required for a copy of the specification. Deposits must be made by cheque payable to Hants County Council and crossed Bank of England, or particulars will not be sent. Tenders endorsed "Proposed Work, Fawley Council School," are to be delivered to H. Barber, Clerk to the County Council, The Castle, Winchester, not later than 10 a.m. on July 23.

July 23. Risca.—*For the erection of public offices, stables and cartshed, together with boundary walls.* Plans and specifications may be obtained from A. J. Dardis, surveyor, Council Offices, Risca, on deposit of £2 2s. Separate prices must be shown for each of above works. Fair wages clause. Tenders must be sealed and marked "Tender for Offices," and delivered to T. S. Edwards, Clerk to the Council, 24, Stow Hill, Newport, Mon., on or before July 23.

July 23. Porchester.—*Gravelling, erection of offices, ventilation, &c.*, at the Council school. Plans and conditions of contract may be seen and specifications obtained at the office of W. J. Taylor, county surveyor, The Castle, Winchester, on and after July 9, between the hours of 9 a.m. and 5 p.m. (Saturdays 9 a.m. and 1 p.m.). Plans and conditions of contract may also be seen at the school. A deposit of £1 1s. will be required for a copy of the specification. Deposits must be made by cheque payable to Hants County Council and crossed Bank of England, or particulars will not be sent. Tenders endorsed, "Proposed Work, Porchester Council School," are to be delivered to H. Barber, The Castle, Winchester, not later than 10 a.m. July 23.

July 23. Bexley.—*The extension of the existing Car Shed* to form a paint shop. *The erection of a steel structure for a repairing shop* for the Urban District Council. Drawings, specifications and bill of quantities may be seen at the manager's office, car sheds, Bexley Heath. Copies of the bill of quantities will be supplied on payment of 10s. Sealed tenders marked (1) "Paint Shop," (2) "Repairing Shop," as above to be delivered to C. G. Baynes, Oak House, Bexley Heath, Kent, not later than noon, July 23,

July 23. Braishfield.—*Repairs, painting, and provision of lavatory accommodation* at the above school, Conditions of contract may be seen, and specification obtained of W. J. Taylor, county surveyor, The Castle. Winchester, between the hours of 9 a.m. and 5 p.m. (Saturdays 9 a.m. and 1 p.m.) Conditions of contract may also be seen at the school. A deposit of £1 1s. will be required for a copy of the specification. Deposits must be made by cheque payable to Hants County Council and crossed Bank of England, or particulars will not be sent. Tenders endorsed "Proposed Work, Braishfield Council School," are to be delivered to H. Barber, The Castle, Winchester, not later than 10 a.m. on July 23.

July 24. Douglas (Isle of Man).—*Alterations and additions* to the Tynwald Street Schools (Girls' Department). For plans and specifications apply to G. & W. R. Kay, architects, Athol Street, Douglas. Fair wages clause. Full particulars as to the time of the commencement and completion of the work and conditions upon which tenders will be received may be had from the clerk of the School Board or the architects. Sealed tenders, endorsed "Tenders for Alterations to Tynwald Street School," to be delivered at the office of the Board on or before July 24.

July 24. London, S.W.—*Pulling down and reconstructing* the second portion of the Streatham Depôt, Streatham Hill, as a car shed for electric cars. Full information as to the conditions to be observed by Tenderers is given in the London County Council Gazette (price 1*d.*, post free 1½*d.*), which can be obtained from P. S. King & Son, 2 & 4, Great Smith Street, Westminster, S.W. Tenders must be upon the official forms to be obtained from the Superintending Architect's Department (Highways Section), 13 Charing Cross, S.W., and no Tender will be received after 10 a.m. on July 24.

July 25. Birmingham.—*Erection of six homes for epileptics and other works* on the Monyhull Hall Estate, near King's Heath, Birmingham, according to plans and specifications prepared by C. Whitwell and Son, architects to the Joint Committee. Builders desirous of tendering must apply to R. J. Curtis, clerk to the Joint Committee, Guildhall Buildings, Birmingham, in writing, and deposit the sum of £25. Bills of quantities will then be forwarded, together with instructions as to the inspection of plans and drawings. The amount of the deposit will be returned by the Joint Committee's cheque to those who deliver a bona fide tender on or before July 25. No tender definitely accepted until the Local Government Board has finally approved the plans and estimates.

July 25. Honiton.—*Taking down and removal* of the old brick arch and parapets, re-building the present abutments to a new line, and supplying and fixing an iron bridge. The plans, specification and form of contract can be seen at the office of the County Council at the Castle of Exeter, where tenders are to be sent on or before July 25

July 26. London, N.E.—*Erection of a central library building* in Mare Street, Hackney. Plans and specifications may be seen and bills of quantities, with conditions, form of tender and form of contract may be obtained at the offices of the architect, H. A. Crouch, A.R.I.B.A., 12 Gray's Inn Square, W.C., on payment of £1 1s. Tenders, sealed and endorsed "Tenders for Central Library Buildings," to be deposited with W. A. Williams, town clerk, Town Hall, Hackney, not later than 5 p.m. on July 26.

July 26. Nantymoel.—*Erection of new stables, carthouse, yard, and boundary walls*, also new butcher's shop, and conversion of existing stables into shoemaker's shop at Nantymoel, near Bridgend, for the Co-operative Society. Plans and specifications may be seen at the Co-operative Stores, where forms of tender and bills of quantities can be obtained upon a deposit of £1 1s. Sealed and endorsed tenders to be sent to the secretary, Mr. John Morgan, Co-operative Society, Nantymoel, not later than July 26.

August 1. London, W.—*Erection of Workshops* at the Workhouse in the Harrow Road, W., pursuant to plans and specification to be seen at Messrs, Giles, Gough & Trollope, Architects. 27 Craven St,. Strand W.C., between the hours of 10 and 5, where all necessary information can be obtained and also form of Tender. Bills of quantities may also be obtained at the Offices of the said Architects, on payment of a deposit of £5 5s. Fair wages clause. Sealed tenders must be delivered to H. F. Aveling, 313-319, Harrow Road, W., before 10 o'clock a.m. on August 1.

August 16. Antwerp.—*Reconstruction of the Government Bonded Warehouses*, known as the "Nord-Ancien and Nord-Nouveau." The specification ("*Cahier des charges*," No 1,144), relating to the contract may be obtained from the Hôtel de Ville, Antwerp, at a cost of 2 francs. All tenders should be sent in sealed registered envelopes, addressed "A Monsieur le Bourgmestre en l'Hôtel de Ville d'Anvers," and should reach the Hôtel de Ville not later than August 16. A deposit of £1,000 is required to qualify any tender. A copy of the specification may be seen at the offices of the Commercial Intelligence Branch of the Board of Trade, 73 Basinghall Street, London, E.C.

No Date. Guildford.—*Construction of a flight of steps* in Harvey Road, Guildford, for the Trustees of Poyle Charity. The Drawing and Specification of Works can be seen of W. G. Lower, 12a, High Street, Guildford.

No date. Bognor.—*Enlargement of the Council School at Bognor.* Particulars and forms of tender may be obtained from W. L. Barrett, Arcade Chambers, Bognor. Tenders should be sealed and addressed to "The Secretary, West Sussex and Chichester Joint Education Committee, Education Offices, Horsham."

No date. Longton.—*Erection of new classrooms and other additions* to Heathcote Road Wesleyan Mission, Longton. Builders desirous of tendering will please forward their names to William Wood, architect, Longton.

No date. Truro.—*Restoration* of St. Erme Tower, Truro. For specification apply by letter, Edmund Sedding, architect, Plymouth or Wadebridge; or to the Rev. J. O. Cunning, St. Erme, Truro.

ENGINEERING.

July 16. Belfast.—*Supply and erection of a steel lattice girder bridge*, 51ft. span and 15ft. wide. Drawings, specifications and particulars may be obtained from the City Surveyor on payment of £1 1s. Sealed tenders, endorsed "Tender for Bridge," to be lodged not later than July 16.

July 16. Birmingham.—*Tramways* contract 1: The reconstruction and completion within four months of commencement of the permanent way of the tramways on about 1⅝ miles of route in the Moseley and King's Heath district as double line, together with the construction of a double line of new tramways in extension of the existing lines for a length of about ¾ mile route, to be completed by December 15 next. The rail proposed to be used is the British Standard Section No. 4; contract 2: The overhead electrical equipment of the same routes to be completed by December 15 next, for the King's Norton and Northfield U.D.C. Specification, form of tender, and further particulars may be obtained from the Council's engineer and surveyor, A. W. Cross, 23, Valentine Road, King's Heath, near Birmingham; or C. H. Gadsby, 20, Victoria Street, Westminster, S.W., engineer, on deposit of a £5 Bank of England note for each contract. Sealed tenders, on the prescribed forms, and endorsed "Tender for Tramway Permanent Way," or "Electrical Equipment" (as the case may be). are to be sent to the Office of Edwin Docker, clerk, 10, Newhall Street, Birmingham, not later than noon on July 16. Fair wages clause.

July 16. Sheerness.—*For the construction of a heading* about 110ft. in length at a depth of 280ft. or thereabouts between the two deep wells which supply the town with water, in accordance with the plans and specifications, which may be seen at the Council Offices by appointment with the Surveyor to the Council. Payment will be made in one sum on production of the certificate of the Surveyor of the Council that the work has been completed to his satisfaction. The person whose Tender is accepted will be required to enter into a bond in the penal sum of £500, with two sureties or an approved guarantee society, for the due performance of his contract. Tenders, which must be at per foot run of heading, and on a form to be obtained from the Surveyor, should be sent or delivered to V. H. Stallon, Council Offices, Trinity Road, Sheerness, before 5 p.m. on July 16.

July 17. London, W.—*Supply of about 800 tons of girder work and other iron and steel work* of British manufacture for the Great Western Railway, to be let in three contracts. Plans and specification may be seen and forms of tender and bills of quantities obtained at the office of the Engineer at Paddington Station, between 10 a.m. and 4 p.m. Tenders, addressed to G. K. Mills, Paddington Station, W., and marked outside "Tender for Girder Work," will be received on or before July 17

July 20. Leeds.—*Construction of four filter beds, clear-water tank, meter house, the making of roads, laying of pipes, and drains, &c.*, in connection therewith, at the site of their New Filter Beds, Otley Road, Headingley, Leeds. Plans may be seen, and the specification, bill of quantities, and form of tender obtained, at the office of Chas. G. Henzell, M.Inst.C.E., Waterworks Engineer, Municipal Buildings, Leeds, on payment of a deposit of £5. Tenders, endorsed "Tender for New Filter Beds, &c., at Headingley," must be addressed to the Chairman of the Waterworks Committee, and delivered in a sealed cover at the Town Clerk's Offices, Town Hall, Leeds, not later than 10 a.m. on July 20.

July 23. Beckenham.—*Electric wiring of houses* in the district, for the Urban District Council Specifications, general conditions and forms of tender can be obtained on payment to the council's collector of the sum of £2 2s. The collector attends at the Council's Offices, Bromley Road, Beckenham, from 9 to 10 a.m. daily. For any further information with regard to the proposed Contract, application should be made to the Resident Electrical Engineer, J. E. Tapper, Electricity Works, Arthur Road, Beckenham. Sealed Tenders endorsed "Wiring," to reach F. Stevens, clerk, Council Offices, Beckenham, not later than 4 p.m. on July 23.

July 25. Rainhill.—*Plant* for the County Asylum, as follows:—(*a*) *One independent surface condensing plant with electrically-driven pumps, together with the necessary pipework.* (*b*) *One water softening and purification plant.* Plans and works may be seen, conditions, specification and form of tender may be obtained from the Engineer's Office at the Institution. Tenders to reach J. Gornall, clerk's office, County Asylum, Rainhill, not later than 5 p.m. on July 25, endorsed on the outside "Water Softening."

July 27. Sunderland.—(*a*) *Two 250-kw. synchronous motor generators, 5000—240 volts.* (*b*) *High tension and low tension switchgear for the electricity department.* The specifications and forms of tender can be obtained on application to the Borough Electrical Engineer, J. F. C. Snell, M.Inst.C.E., Town Hall, Sunderland, and on payment of a deposit of £1 1s. for each specification. Sealed tenders addressed to the "Chairman of the Electricity and Lighting Committee," Town Hall, Sunderland, must be delivered to F. M Bowey, Town Hall, Sunderland, not later than 12 o'clock noon on July 27. Tenders to be endorsed "A" or "B" according to the item tendered for.

July 30. Stanley and West Hallam.—*Waterworks at Stanley and West Hallam*, Derbyshire, including laying 4,466 yards of 6in., 3,050 yards of 4in., and 1,910 yards of 3in. cast iron pipes, with all appurtenances, and the construction of a brick service reservoir (capacity 90,000 gallons). Plans may be seen and specification and bills of quantities obtained, at the offices of Elliott and Brown, engineers, Burton Buildings, Parliament Street, Nottingham, after July 16, 1906, on deposit of £2 2s. Sealed tenders, addressed to J. W. Newbold, Council Offices, Derby, and endorsed "Tender for Waterworks," to be delivered on or before the first post on July 30, 1906.

September 4. Lancaster.—Proposed re-construction of steam heating arrangements and hot water service at County Lunatic Asylum, Lancaster. Tenders to be sent by September 4th (extended date) to J. T. Cheetham, clerk and steward.

PAINTING AND PLUMBING.

July 12. Woolwich.—*Cleaning and painting* the exterior of the Woolwich Union Infirmary at Plumstead. The specifications can be inspected on application to the Steward, between 10 a.m. and 4 p.m. Estimates marked "Tender for Painting" must reach Tom Cutter, clerk to the Guardians, Union Offices. Workhouse, Plumstead, on or before 10 a.m. on July 12.

July 13. Scarborough.—*Toll-house on the Valley Bridge, Scarborough.* Plans and specification may be seen and form of tender and bills of quantities obtained on application to H. W. Smith, A.M.I.C.E., Town Hall, Scarborough, on and after July 9. Sealed tenders, endorsed "Tender for Toll-house," in an envelope provided for the purpose to be delivered at the office of D. Arthur Nicholl, town clerk, not later than 12 o'clock noon on July 13. A deposit of £1 1s. is to be made with the borough accountant before any particulars or form of tender can be supplied.

July 14. Chell.—*Whitening ceilings, washing paint and painting at the workhouse hospital and chapel.* Particulars may be ascertained on application to the Master, Union Workhouse, Chell. Tenders must be sent in to J. A. Lowndes, Poor Law Offices, Burslem, endorsed, not later than July 14 by 10 o'clock a.m.

July 14. Northlew.—*Building a new vestry and putting a new window* in the north aisle of Northlew church. Plans and specifications can be seen at Elmfield House, and further information will be given on application by letter to H. L. Woollcombe, Elmfield House, Northlew, Beaworthy. Tenders must be sent in by July 14.

July 14. Workington.—*Painting, etc.* of the Central Stores, Vulcan's Lane, Workington, for the Beehive Co-operative Society, Limited. Specifications can be seen upon application to W. G. Scott & Co., Architects and Surveyors, 2, Park Lane, Workington, who will receive sealed endorsed tenders up to 12 a.m. on July 14.

July 16. Cardiff.—*Painting, colouring, &c.*, the inside and outside of the Wood Street Council School. Specifications of the work may be obtained at the Education Offices, Howard Gardens, Cardiff. Tenders sealed and endorsed "Tender for Painting Wood Street Council School" must reach J. J. Jackson, Education Offices, Howard Gardens, Cardiff, on or before July 16.

July 17. Stockport.—*Painting* (labour and materials) the whole of the wood and iron work at Hollywood Park, and Heaton Norris Recreation Ground. Specifications and conditions and forms of tender may be obtained on application to John Atkinson, A.M.Inst.C.E. borough surveyor, Borough Surveyor's Office, Stockport. Tenders addressed "The Borough Surveyor, Stockport," sealed and endorsed "Tender for Painting at Parks," to be left at his office at or before noon on July 17. Fair wages clause.

July 17. Manchester.—*Painting* New Islington Public Hall (interior). Specification may be obtained at the city architect's office, Town Hall, upon payment of £1 1s. Sealed enders, enclosed in the official envelope, to be delivered at the above office not later than 9 a.m. on Tuesday, July 17.

July 18. Stockton-on-Tees.—*Washing and distempering* to be done during the midsummer holidays at the Higher Grade Schools. Specification may be seen and other particulars obtained from M. H. Sykes, borough engineer, Town Hall. Tenders to be sent before 10 a.m. on July 18.

July 18. Bagthorpe.—*Cleaning and painting* at the Bagthorpe Hospital. Specifications, forms of tender, and bills of quantities may be obtained from Frank B. Lewis, city architect, Guildhall, on payment of a deposit of £1 1s. Sealed tenders to be delivered to S. G. Johnson, town clerk, Guildhall, Nottingham, at or before 10 a.m. on July 18. Fair wages clause.

July 18. Leeds.—*Painting and cleaning* of schools for the City of Leeds Education Committee. Specifications and full particulars of the work may be had on application to the Architect's Department, Education Offices, or to W. Packer, secretary, Education Offices, Leeds, to whom sealed and endorsed tenders must be sent not later than 12 o'clock noon on July 18.

July 21. Derby.—*Painting and colouring* at various Council and Voluntary Schools during the summer holidays. Tenders must be delivered not later than 10 a.m. on July 21. Specifications can be obtained from William Cooper, secretary to the Derby Education Committeee, Education Offices, Becket Street, Derby,

July 23. Winchester.—*Painting and decorating, new drains, new offices, ventilation, &c.*, at the Waterloo Council School. Plans and conditions of contract and specification obtainable at the office of W. J. Taylor, county surveyor, The Castle, Winchester, on and after July 9, 1906, between the hours of 9 a.m. and 5 p.m. (Saturdays 9 a.m. and 1 p.m.) Plans and conditions of contract may also be seen at the School. A deposit of £1 1s. will be required for a copy of the specification. Deposits must be made by cheque, payable to Hants County Council, and crossed Bank of England, or particulars will not be sent. Tenders endorsed "Proposed Work, Waterloo Council School," are to be delivered to H. Barber, clerk of the County Council, The Castle, Winchester not later than 10 a.m. on July 23.

July 23. Awbridge. *Repairs, painting, provision of lavatory accommodation, erection of offices, etc.*, at the above School. Plans and conditions of contract and specification obtainable of W. J. Taylor, County Surveyor, The Castle, Winchester, between the hours of 9 a.m. and 5 p.m. (Saturdays 9 a.m. and 1 p.m.). Plans and conditions of contract may also be seen at the the school. A deposit of £1 1s. will be required for a copy of the specification. Deposits must be made by cheque payable to Hants County Council and crossed Bank of England, or particulars will not be sent. Tenders endorsed "Proposed Work, Awbridge Council School," are to be delivered to H. Barber, The Castle, Winchester, not later than 10 a.m. on July 23, 1905.

July 23. Bramley.—*Painting and renovating* the Board Offices at 1, Green Hill Road, Armley. Specification may be seen at the Clerk s Office on application. Tenders must reach A. Gaunt, clerk to the Guardians, Union Offices, Armley, not later than twelve o'clock noon on July 23.

July 23. Fareham.—*Repairs, external and internal painting, ventilation etc.*, at the Fareham Council School. Plans, conditions of contract, and specification may be obtained of W. J. Taylor, county surveyor, The Castle, Winchester, between the hours of 9 a.m. and 5 p.m. (Saturdays 9 a.m. and 1 p.m.). Plans and conditions of contract may also be seen at the school. A deposit of £1 1s. will be required for a copy of the specification. Deposits must be made by cheque payable to Hants County Council and crossed Bank of England, or particulars will not be sent. Tenders, endorsed "Proposed work Fareham Council School," are to be delivered to H. Barber, The Castle, Winchester, not later than 10 a.m. on July 23.

July 24. Harrington.—*Joiner's work, slating, plumbing, glazing, and painting* required in the erection of Four Houses at Burnside, Harrington, for Mr. P. Craine. Plans and specifications can be seen on application to W. G. Scott & Co., Architects and Surveyors, 2, Park Lane, Workington, who will receive sealed tenders, endorsed "Burnside Cottages," up to July 24.

July 24. Kent.—*Maidstone and Canterbury Sessions, Houses, and Elham, New Brompton, Sandwich, Seabrook and Sheerness Police Stations, Painting and repairs.* Bill of Quantities and Tender Form for each or either of them can be obtained at the Office of the County Architect, 86, Week Street, Maidstone. The Specification of the work can be inspected at the Buildings daily between the hours of 10 and 5. Sealed tenders, endorsed "Painting &c.," are to be delivered at the Sessions House, Maidstone, addressed to C. Turner, clerk, Sessions House, Maidstone, not later than 10 o'clock on July 24.

July 25. Whittingham County Asylum, Preston.—*Outside painting.* Tenders are invited for labour and plant only, and a separate one for the materials, paints, oils, varnishes, &c., for same. Specifications, with forms of tender, may be obtained from Thomas Dilworth, clerk and steward, at the asylum. Tenders to be in on or before July 25, at 10 o'clock in the morning.

July 28. Castleknock.—*Plumbing works* required to be done at the new residence for the medical officer at Castleknock, in accordance with the specification and plans, which can be seen and copied at Boardroom, North Brunswick Street, Dublin. Any further information can be had from Mr. Morris, clerk of works. Fair wages clause. Sealed tenders (with wax) will be received in the tender box at the Boardroom up to noon on July 18.

No date. London, E.—*Execution of whitewashing, painting, &c.*, at the Lunatic Wards on the Workhouse Premises in Bancroft Road, E. Forms of tenders and full particulars relating to the work can be had upon application at the offices of J. M. Knight, architect, 35, Bancroft Road, Mile End, E. Fair wages clause.

No date. London, N.E.—*Painting works* at the Guardians Offices, 53, Clerkenwell Road, E.C. Copy of the specifications and form of tender may be obtained from J. Allan Battersby, Clerk to the Guardians, 57 Clerkenwell Road.

ROADS AND CARTAGE.

July 12. Newhaven.—*Supply of about 300 tons of 2-inch broken Kentish rag stone* for the Rural District Council to be delivered in quantities as required at Falmer, Kemp Town, Lewes, and Newhaven Stations: Also tenders for scarifying and rolling the roads in the Council's district, such rolling, etc., to be commenced not later than the first week of November next. The contractor will be required to provide the necessary labour, fuel, etc., to complete the work. Tenders for the rag stone, together with samples, as also tenders for scarifying, etc., to be forwarded to H. W. Coupe, clerk to the Council, Union Offices, Workhouse, Newhaven, not later than July 12.

July 13. Castleford.—*Asphalting of the playgrounds* at Glass Houghton Provided School, Castleford. Specifications may be had from B. Leah, Divisional clerk, Castleford, to whom sealed Tenders must be sent before July 13.

July 13. Reigate.—*Supply of the following materials:—Granite macadam, granite kerb, granite setts, Kent ragstone, tar paving, flints, gravel, concrete, beach, Portland cement.* Specifications may be seen and forms of tender obtained upon application to Fred T. Clayton, the Borough surveyor, ; and every person tendering will be required to deposit at his office at the Municipal Buildings, Reigate, a sample of the materials for which he tenders. Sealed tenders, endorsed "Tender for Granite," or as the case may be, are to be delivered to A. Smith, Municipal Buildings, Reigate, on or before noon, on July 13.

July 14. Dorking.—*Supply of English granite* for roadmaking, broken to 1½-inch gauge, delivered free on rail at Dorking when required during October and November next, for the U.D.C. Sealed tenders, marked outside "Granite," with samples and particulars as to quality, to be sent to W. J. Hodges, 64, Stone Street, on or before July 14.

July 14. Durham.—*Paving* in granite setts the roadway of Framwellgate Bridge in the City of Durham. Quantities and forms of tender can be obtained and plans, specifications and conditions, of contract seen at the County Surveyor's Office, Shire Hall, Durham, where tenders are to be delivered not later than July 14.

July 16. Camberwell.—*Kerbing, channelling, foundations for asphalt paving and roadwork*, in the following new streets:—Eynella Road and Turney Road (part of), Dulwich. Specifications and forms of tender can be obtained from W. Oxtoby, borough engineer; and tenders must be delivered on or before July 16 not later than 6.30 p.m., addressed to the Works and General Purposes Committee.

July 16. Workington.—*Formation of Park Lane within the borough.* Plans and specifications may be seen at the borough surveyor's office. Tenders to be sent to J. Warwick, town clerk, Town Hall, Workington, not later than July 16.

July 17. Dartford.—*Making-up of Junction Road North, Priory Hill, Anne of Cleves Road, and Priory Road, Dartford*, in accordance with the plans and specifications, which may be seen and quantities obtained, upon applying at the office of the Surveyor, T. E. Tiffin, Council Offices, Dartford. A deposit of £2 2s. must be paid for the quantities. Tenders, endorsed "Tender for Private Street Works," must be delivered to W. Kay, Clerk to the U.D.C., Dartford, not later than July 17.

July 17. Leeds.—*Paving and Flagging* of the following streets: Harold Grove, Back Harold Grove, Raincliffe Grove, Temple View Terrace; Raincliffe Street, Chantrell Place, Everleigh Street, Everleigh Place, Everleigh Grove and Chantrell Grove. Drawings may be seen at the city engineer's Office, Municipal Buildings. Forms of Tender and Bills of Quantities may be obtained, and copies of the documents forming the contract inspected, on application at the Highways Office, 155, Kirkstall Road. Sealed tenders, endorsed "Tender for Private Street Works," and addressed to the Highways Committee, must be delivered at the Town Clerk's Office, Town Hall, Leeds, not later than 10 a.m. on July 17.

July 17. London, E.C.—*Repair and maintenance of all works of stone paving in the carriageways and footways* of the City as may from time to time be required during periods of One, Two or Three years, commencing from Michaelmas Day next, upon the terms and conditions contained in specification which may be obtained at the office of the City Engineer on payment of £2 2s. Persons tendering must give the names and addresses of at least two substantial sureties, who will be required to enter into a bond for the due performance of the contract. Tenders must be addressed to the Town Clerk, Public Health Department, Guildhall, E.C., endorsed "Tenders for Masons' and Paviors' Work," and delivered at the Office of the Hallkeeper, Guildhall, between 12.30 and 1.30 on July 17.

July 17. King's Heath.—*Making good of Woodville Road*, King's Heath. Specifications, bill of quantities, and form of tender may be obtained from the engineer and surveyor to the Council, Ambrose W. Cross, A.M.I.C.E., 23, Valentine Road, King's Heath, on payment of a deposit of £2 2s. Plans may also be seen at the said offices, 23, Valentine Road, King's Heath. Sealed tenders, endorsed "Tenders for making good Woodville Road," must be sent to E. Dockree, 10, Newhall Street, Birmingham, not later than 12 o'clock noon, on July 17.

July 17. Bishopthorpe.—*Asphalting of the play-grounds* (two) at Copmanthorpe Provided School. Sealed tenders to be delivered to B. J. Sheard, Education Offices, Selby (from whom specifications may be obtained), not later than July 17.

July 20. Wycombe.—*Hire of steam rollers* between October, 1906, and March, 1907, by Wycombe Rural District Council. Sealed tenders to be delivered not later than Friday, July 20, to the clerk, 41, High Street, High Wycombe, where specifications can be seen.

July 23. Westhampnett.—*Steam Rolling* for Rural District Council. The contractor will have to supply rollers, water carts and all things necessary or requisite for the execution of the work. The rolling will have to be done at such times and in such manner as the Council or their surveyor may from time to time direct. The contractor whose tender is accepted will be required to enter into a contract for the due performance of the work. The form of contract may be seen and further particulars obtained at the offices of the Council. Tenders stating the weight of rollers and all particulars, with price per day inclusive, marked on the outside "Tender for Steam Rolling" to reach William Duke Rasell, acting clerk to the Council, 5, South Street, Chichester.

July 24. Harrow-on-the-Hill.—*For the supply of about* 2,000 *tons of 2-inch or 1¾-inch broken granite and 1-inch or ¾-inch granite chippings* for the U.D.C., delivered free in such quantities as may be ordered by the Council's Surveyor, at the Harrow Railway Stations (London & North Western Railway or Metropolitan). Tenders are also invited for the supply of about 120 yds. of coarse gravel and 150 yds. of fine gravel, to be delivered free at the Harrow Metropolitan Station in such quantities and at such times prior to March 31st, 1907, as the Council's Surveyor may direct. Samples of granite and gravel to be sent to the Surveyor's Office, carriage paid, before the date of the delivery of the Tenders, and no Tender will be considered unless accompanied by Samples. Tenders, endorsed "Tender for Granite" (or "Gravel," as the case may be), to be sent to J. Percy Bennetts, Surveyor to the Council, Harrow, on or before July 21.

July 24. Southampton.—*Supply of* [1] *2,000 tons of broken granite*, [2] *1,500 tons of broken flints.* Specifications, Conditions, and Forms of Tender may be obtained at the Borough Engineer's Office, 123, High Street, Southampton. Tenders, properly endorsed, must be delivered to R. R. Linthorne, Municipal Offices, Southampton, before 2 p.m. on July 24.

July 28. Chard.—*Rolling the stones* to be laid on main and district roads during the ensuing season. The contractor to provide two 15-ton steam rollers fitted with Henderson's patent detachable scarifiers, and two 10-ton steam rollers, to commence work early in September. Additional rollers to be provided if required. Inclusive charges at per day and at per cubic yard rolled to be named, for the selection of the council. Further information and forms of tender may be obtained from R. Stephens, district surveyor, Ilminster, or F. G. Ross, Rural District Council Office, Chard. Tenders, endorsed "Steam Rolling Tender," to be sent before July 28.

SANITARY.

July 12. Brighton.—*Supplying such glazed drain pipes* as may be required by the Corporation for the year ending July 31, 1907. The specification and form of tender may be obtained on application at the office of the borough surveyor, at the Town Hall, Brighton. Sealed tenders, addressed to H. Talbot, Town Hall, Brighton, and endorsed "Tender for Supply of Drain Pipes," must be left at the Town Hall, before 10 a.m. on July 12.

July 16. Beckford.—*For the execution of all work involved by the connection of house drains to new sewerage system and laying service pipes* from water-mains to houses in the parish of Beckford, Gloucestershire, on the basis of a schedule of prices. Specifications and Schedules may be obtained at the Offices of Willcox & Raikes, engineers, 63, Temple Row, Birmingham, on payment of a deposit of £2 2s. Sealed Tenders, with Schedule of Prices filled in in detail, on the form supplied, endorsed "Beckford Sewerage and Water-Supply House Connections," must be delivered to H. W. Stephens, Winchcomb, Glos., not later than 12 noon on July 16.

July 16. Bedhampton.—*Ventilation, conversion of privies to water closets, new offices and drains and new iron boundary fences* to the school. Persons desirous of tendering may see plans and conditions of contract and obtain specification at the office of W. J. Taylor, county surveyor, The Castle, Winchester, between 9 a.m. and 5 p.m. (Saturdays, 9 a.m. and 1 p.m.) Plans and Conditions of Contract may also be seen at the School. A deposit of £1 1s. will be required for a copy of the Specification. Deposits must be made by cheque, payable to Hants County Council, and crossed Bank of England, or particulars will not be sent. Tenders, endorsed "Proposed Work, Bedhampton Council School," are to be delivered to H. Barber, Clerk to the County Council, The Castle, Winchester, before 10 a.m. on July 16.

July 16. Blean.—*For the supply, delivery, laying, jointing, and of the materials for and the constructions of sewers* at Forty Acres, in the Parish of St. Stephen, for the R.D.C. The whole of the goods to be supplied and work carried out in accordance with the specifications, &c., prepared by the Council's acting surveyor. Plans and sections may be seen at the office of, and specifications and form of tender obtained from, the acting surveyor, L. T. Ashenden, 29, Westgate, Canterbury, on payment of 10s. Tenders to be delivered at the Clerk's Office, 39, Castle Street, Canterbury, on or before July 16, endorsed "Tender for Sewers."

July 21. Hindley.—*Construction of a 12-inch sewer*, about 300 yards long, in Strangeways Fields, Hindley, together with manholes and other works incidental thereto, for the Urban District Council. Persons desirous of tendering for same may obtain form of tender, &c., from the surveyor, Oswald P. Abbott, on payment of £1 1s. Sealed tenders, endorsed "Sewer," to be sent to T. Robey, Council Offices, Hindley, not later than July 21.

MISCELLANEOUS.

July 14th. Priestfield.—*Supply, delivery and fixing of unclimbable fencing* at the Ettingshall Schools, Priestfield, for the Bilston U.D.C. Outline specification and further particulars may be obtained upon application to J. P. Wakeford engineer and surveyor, Town Hall, Bilston. Tenders sealed and endorsed "Tender for Fencing" must be delivered not later than 12 o'clock, July 14.

TENDERS

Continued from page xx.

Maldon.—For the erection of a new secondary school and pupil teachers' centre, for the Essex Education Committee (Maldon Advisory Sub-Committee). Mr. P. M. Beaumont, architect, Maldon.

F. Bennett, Ipswich	£7,999
F. P. Bliss, Bushey, Herts	7,675
J. Smith & Son, Witham	7,555
Everett & Sons, Colchester	7,474
Elvy & Son, Southend-on-Sea	7,425
C. Roper, Ipswich	7,400
W. Holt & Sons, Croydon	7,375
Wallis & Sons, Maidstone	7,329
E. Saunders, Dovercourt	7,329
Coulson & Lofts, Cambridge	7,300
F. Thurman, Ipswich	7,299
W. & B. H. Davey, Southend-on-Sea	7,294
R. Shanks, Chatteris, Cambs	7,213
Myall & Upson, Clacton-on-Sea	7,180
J. McKay, Clacton-on-Sea	7,180
C. Deaves, Bures	7,110
H. Potter & Son, Chelmsford	7,100
Grimwood & Son, Sudbury	6,998
Mason & Son, Haverhill	6,899
S. E. Moss & Co., Southend-on-Sea	6,720
J. Rayner, East Hanningfield	6,675
Parren & Son,* Earith, Hunts	6,500

* Accepted.

Nottingham.—Accepted for pulling down old premises and erecting a four-storey factory. Messrs. Heazell & Sons, architects, Burton Buildings, Nottingham. Quantities by architects :—

H. Enoch, Nottingham	£3,955

Nottingham.—Accepted for the erection of a house, Mapperley Park, Nottingham. Messrs. A. R. Calvert & W. R. Gleave, 18, Low Pavement, Nottingham, architects :—

G. Hopewell & Son	£1,380

Poole.—For proposed store at Poole. Mr. F. Bath, architect, Crown Chambers, Salisbury :—

J. McManus, London, W	£2,325	0	0
Peirson & Co., London, E.C.	2,137	0	0
Hadley & Sons, Old Hill, Staffs	2,132	0	0
F. Deacon & Son, Addlestone	2,100	0	0
A. & J. Main & Co., London, E.C.	2,365	2	3
F. Smith & Co., London, E.	2,049	0	0
E. F. Blakeley & Co., Liverpool	1,998	0	0
Redpath, Brown & Co., London, S.E.	1,991	0	0
F. Braby & Co., Glasgow	1,989	13	5
H. Sampson & Sons, Bristol	1,972	0	0
D. G. Somerville & Co., London, S.W.	1,953	0	0
G. Thompson & Co., Birmingham	1,950	0	0
Jukes, Coulson, Stokes & Co., London, E.	1,940	0	0
A. J. Colborne, Swindon	1,939	13	0
W. G. Crane, Poole	1,935	0	0
Norton Bros. & Co., Ilford, E.	1,900	0	0
Vincent & Folland, Salisbury	1,886	12	0
Dorset Ironfoundry Co., Poole	1,868	9	9
F. W. Besant & Co., Wimborne	1,834	0	0
Burt & Vick, Poole	1,799	0	0
W. Glover & Sons, Warwick	1,738	12	4
Kirk & Randall, Woolwich	1,720	0	0
Wirewove Roofing Co., London, E.C.	1,672	0	0
Wood Bros.,* 93, Whyteville Road, Forest Gate, London, E.	1,400	0	0

* Accepted.

Risca.—For rebuilding the Forester's Arms and Rifleman's Arms at Risca, for Messrs. Wm. Hancock & Co., brewers and wine merchants, Newport and Cardiff. Messrs. Swalwell & Havard, architects, Steam Packet Chambers, Dock Street, Newport :—

	Forester's Arms.	Rifleman's Arms.
Clements & Co., Newport	£1,600 0 0	£1,572 0 0
C. H. Reed, Newport	1,572 0 0	890 0 0
E. R. Evans & Co., Cardiff	1,535 10 0	905 14 3
Hughes & Stirling, Bootle, Liverpool	1,502 0 0	935 0 0
F. W. Powles, Newport	1,467 0 0	857 0 0
J. Jenkins, Ltd., Newport	1,447 0 0	949 0 0
A. S. Morgan & Co., Newport	1,418 0 0	877 0 0
E. G. Clarke, Newport	1,390 0 0	850 0 0
G. F. Leadbeter, Newport	1,387 0 0	835 0 0
Jerman, Risca	1,382 10 0	765 0 0
Poulton & Whiting, Pontnewydd	1,370 4 6	838 1 2
J. H. Leadbeter*, St. John's Road, Newport	1,348 0 0	784 0 0
Herbert, Newport	1,150 0 0	750 0 0
Knowler, Newport	— — -	862 0 0
Coakham, Newport	— — -	847 0 0

* Accepted.

Seaford.—For the erection of a detached residence, "Rosecroft," for the Seaford West Co., Ltd., for R. F. Lawke. Mr. J. W. B. Blackman, P.A.S.I., architect, Brighton and Seaford :—

Brown & Sons, Brighton	£2,085
Caxton Jay, Brighton	2,000
Wood & Sons, Eastbourne	1,935
Joseph Martin, Eastbourne	1,875
Morling, Seaford	1,625
Smedley, Leicester	1,500
Wilkinson*, Seaford	1,254

* Accepted.

Uxbridge.—Accepted for the erection of a new police court for the Middlesex County Council :—

C. F. Kearley	£6,394

Wellington.—For the completion of All Saints' Church, Wellington, Somerset, by the erection of a tower and spire. Mr. J. H. Houghton Spencer, architect, 5, Hammet Street, Taunton. Quantities by Messrs. W. Waterman & Son, Taunton :—

Merrick & Son, Glastonbury	£2,375	0	9
H. Smith, Worcester Cross, Kidderminster	1,964	0	0
Follett Bros., Wellington	1,925	0	0
C. Trask & Sons, Norton, Stoke-under-Ham	1,860	0	0
Sweet & Burge, Wellington	1,826	10	0
H. J. Spiller & Son, Taunton	1,770	0	0
J. Twyford, Wellington	1,725	0	0
T. H. Moggridge, Taunton	1,710	0	0

EXETER CATHEDRAL.

The Dean and Chapter of Exeter have recently been overhauling the fabric of their cathedral. In one of the great transeptal towers a crack has existed, it is said, for half-a-century. This was inspected a few weeks ago, and the result was, on the whole, reassuring. A thorough examination of the foundations of the south tower was next made and has now been completed, with the result that the excavations have revealed the fact that the great fortress-like tower has been resting upon unsubstantial and failing foundations. These consist of 3ft. of large rough stones, which are disintegrated in parts, and broken rubble, resting not upon rock but upon soil.

In spite of the massive proportions of the tower, there are two causes, apart from defective foundations, which threaten its permanent stability. First, it contains the heaviest peal of bells in the kingdom; and when these bells, ten in number, are ringing in chime, the fabric has to take the strain of 27cwt. of metal swinging and vibrating at once. Furthermore, the tower, like its companion, stands on only three basement walls. The interior, or fourth wall, was removed in the thirteenth century by Bishop Quivil, who thus converted the separate chapels at the base of each tower into the present transepts.

Workmen are now engaged in extending the foundations of the south tower, which are being deepened by 8 or 9ft. It is intended that these new foundations shall be supported by a thick bed of concrete, and strengthened by buttresses of the same material to resist the outward thrust of the masonry, the walls of which are 7ft. thick.

A New Nurses' Home and Laundry have been added to the North-Eastern Hospital for Children. The total cost has been £12,500.

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Bankruptcies.

Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—adjudication.

A. Barnes, builder, painter and paperhanger, Gillingham. P.E., Salisbury Council House, July 12th, at 2.

W. J. Caine, builder, Headley. P.E., Guildford Town Hall, August 14th, at 1.

W. Gowns, builder, Headcorn. First meeting, 9, King Street, Maidstone July 11th at 11. P.E., Maidstone Sessions House, July 11th, at 11.30.

H. G. Lane, builder, Orpington. P.E., Croydon C.C., July 11th at 11.

Lucius & Worsley, builders, Waterhead. First meeting, O.R.'s, Oldham, July 13, at 11. P.E., Oldham C.C., September 21st, at 11.

J. L. Crouche, surveyor, London, E.C. First meeting, Bankruptcy Court, July 12th, at 12. P.E., Bankruptcy Court, August 1st, at 11.30.

F. Elliott, builder, Tamworth. P.E., Birmingham C.C., July 26th, at 2.

T. H. Scutt, architect and surveyor, Brighton. First meeting, O.R.'s, Brighton, July 12th, at 12. P.E., Brighton C.C., July 19th at 11.

J. McGuire, bricklayer, late builder, Hull. First Meeting, O.R.'s, Hull, July 11th, at 11. P.E., Hull C.C., July 16th, at 12.

R. Worthing, plumber, Rhayader. First meeting, R.O.'s, Shrewsbury, July 11th, at 1.30. P.E., Newtown C.C., July 12th, at 11.

T. Rhodes, joiner and builder, Macclesfield. Gross liabilities, £167; assets, £81.

J. T. Williams, builder and contractor, Tipton. Liabilities, £1,083; deficiency, £1,070.

G. A. Watson, builder and contractor, Peterborough. Liabilities, £1325; assets, £373.

J. F. Hinchliffe, joiner, Penistone. Adj., June 27th.

F. A. Simons, builders' merchant, Warwick. R.O., June 28th.

J Viney, painter and paperhanger, Halifax. Adj., June 29th.

W. J. Robinson, engineer, Twickenham and Richmond. R.O., June 25th.

C. Guyan, retired builder, Bristol. Liabilities £776. Examination adjourned to July 27th.

Current Market Prices.

FORAGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	15	0	1	16	0
Clover, best...	per load	4	0	0	4	7	6
Hay, good	do.	3	12	6	3	17	6
Sainfoin mixture	do.	3	10	0	4	0	0
Straw...	do.	1	8	0	1	14	0

MISCELLANEOUS.

		£	s.	d.	
Bricks Stocks, d/d to job	per 1,000	1	15	0	—
Do. Flettons on rail ...	do.	1	5	0	—
Do. Pressed Wire Cuts, d/d to job ...	do.	1	17	0	—
Do. Blue brindled wire cuts	do.	1	2	0	—
Do. do. wire cuts ...	do.	1	6	0	—
Do. do. pressed facings	do.	1	17	6	—
Coke Breeze, into carts at gasworks ...	per load	0	2	0	—
Do. d/d to job	do.	0	4	0	—

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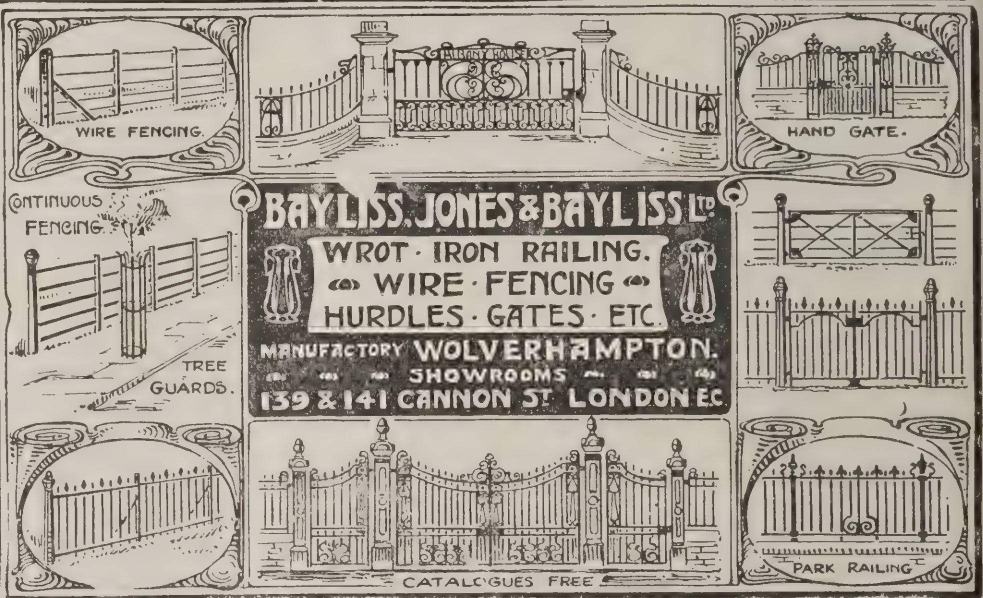
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		£	s.	d.	£	s.	d.
Sand	per yard	0	7	6		—	
Ballast	do.	0	6	6		—	
Granite Chippings ...	do.	0	10	6		—	
Do. do. ¼in. ...	do.	0	11	6		—	
Cement	per ton	1	12	0		—	
Lime	do.	1	4	0		—	
Castor Oil, French ...	per cwt.	1	10	0	1	2	0
Colza Oil, English ...	do.	1	6	0		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	15	0	2	17	0
Lead, white, ground, carbonate	per ton	16	0	0		—	
Do. red	do.	15	0	0	0	19	0
Linseed Oil, barrels ...	per cwt.	1	0	1½		—	
Petroleum, American ...	per gal.	0	0	6⅛	0	0	6¼
Do. Russian ...	do.	0	0	5¾		—	
Pitch	per barrel	0	8	0		—	
Shellac, orange	per cwt.	10	6	0	10	7	0
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Town	per cwt.	1	7	6	1	8	3
Tar, Stockholm	per barrel	1	5	0		—	
Turpentine	per cwt.	2	2	7½		—	

METALS.

		£	s.	d.	£	s.	d.
Standard Copper	per ton	84	0	0	84	10	0
Do. Strong sheets ...	do.	96	0	0	97	0	0
Lead, soft foreign	do.	16	10	0	16	15	0
Do. English	do.	16	12	6	16	15	0
Do. pipes...	do.	19	12	6	19	15	0
Do. sheets	do.	19	2	6	19	5	0
Galvanised Corrugated sheets	do.	12	12	6	12	15	0
Spelter G.M.	do.	26	15	0	27	0	0
Angles, Scotland	do.	6	15	0	7	0	0
Bars, do.	do.	7	17	6	7	19	0
Marked bars, Staffs. ...	do.	9	0	0		—	
Common bars do. ...	do.	6	10	0	6	12	6
Angles, M'boro.	do.	6	10	0	6	12	6
Joists do.	do.	6	2	6	6	5	0
Angles, Midlands	do.	6	10	0	6	15	0
Joists, Midlands	do.	6	15	0	7	0	0
Girder plates, Midlands ...	do.	7	10	0	7	12	6
Angles, Foreign, c.i.f. Thames	per ton	6	10	0	6	15	0
Tees do. do. do.	do.	6	12	6	6	15	0
Joists do. do. do.	do.	6	2	6	6	5	0
Channels do. do. do.	do.	6	7	6	6	10	0
Plates do. do. do.	do.	7	0	0	7	5	0
Tin, Foreign	do.	176	0	0	177	0	0
Do. English ingots ...	do.	177	0	0	178	0	0
Zinc, sheets, Silesian ...	do.	30	0	0	30	10	0
Do. do. Vielle Montaigne	do.	30	0	0		—	

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Pine, Quebec, Yellow ...	do.	3	15	0	6	15	0
Do. Pitch, American ...	do.	3	12	0	5	0	0
Laths, log, Dantzic	per cu. fath.	4	0	0	6	0	0
Deals, Archangel Yellow, 2nd 3×11	per std.	18	0	0		—	
Do. do. do. 3rd, 3×9	do.	11	15	0		—	
Do. do. White, 4th, 3×9	do.	8	15	0		—	
Do. do. Yellow, unsorted, 4×11	do.	5	10	0		—	
Do. do. do. do. 3×9	do.	6	15	0		—	
Do. Blankaholm, Yellow, 1st, 2½×7	do.	10	0	0		—	
Do. do. do. 2nd, 4×9	do.	9	10	0		—	
Do. do. White, 2nd, 3×9	do.	8	15	0	9	0	0
Do. Swartwik, Yellow, 3×9	do.	7	10	0		—	
Do. Hudikswall, Yellow & White, 3×9	do.	7	0	0		—	
Do. do. do. 3×7	do.	7	0	0		—	
Do. Yellow, with some White, 2½×7	do.	7	15	0		—	
Deals, Halifax, Spruce, unsorted, 3×9	do.	8	15	0			
Do. Soroka, Yellow, 2nd, 3×9	do.	14	5	0			
Battens, Archangel, Yellow, 4th, 2×9	do.	10	10	0			
Do. Blankaholm, Yellow, 1st & 2nd, 3×4	do.	9	10	0			
Do. do. do. 1st & 2nd, 2×4	do.	9	10	0		—	
Do. do. do. 2nd 2½×6	do.	8	10	0		—	
Do. do. do. 2nd 2×7	do.	9	10	0		—	
Do. Ingramport, White, Unsorted, 2×4	do.	8	0	0		—	
Do. Larvik, Yellow, Unsorted, 2×2	do.	8	15	3		—	
Do. Hudikswall, Yellow & White, 3×6½	do.	7	0	0			
Do. Norrkoping, Yellow, 1st & 2nd, 2×8	do.	9	0	0		—	
Do. Montreal Red Pine, 1st, 2×6	do.	10	15	0		—	
Do. St. Petersburg, Yellow, 3rd, 2½×6	do.	8	15	0		—	
Do. do. do. 3rd, 2×5	do.	9	0	0			
Do. do. do. 3rd, 2×4	do.	9	5	0		—	
Flooring Boards, Dram. Yellow, unsorted 1×6½	do.	0	9	9			
Do. Lund. White, 1×7	do.	0	8	3		—	
Do. do. Yellow, unsorted, 1×7	do.	0	10	6		—	
Do. do. do. do. 1×5½	do.	0	9	6			
Do. Sandarne, Yellow, 2nd, 1×5½	do.	0	11	0			
Do. Fredrikshald, Yellow, 3rd, 1×4½	do.	0	9	0		—	

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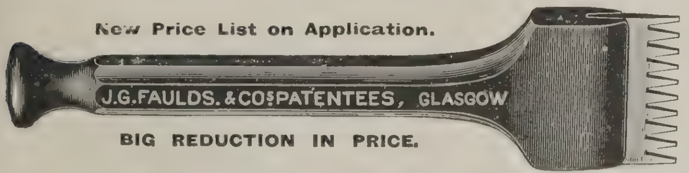
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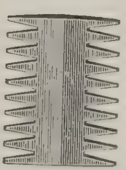

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SEE PAGES XXVII AND XXVIII FOR EMPLOYMENT REGISTER.

THE BUILDERS' JOURNAL
AND ARCHITECTURAL ENGINEER.
July 11th, 1906.

SPECIAL SUPPLEMENT:

The Ritz Hotel, Piccadilly, London.

THE RITZ HOTEL.

From time to time during the past two years we have illustrated the erection of the Ritz Hotel, in Piccadilly, London, and now that the building has been completed and opened we give, in conclusion, a series of views of the finished work. From a constructional point of view the hotel has been especially interesting, as being the most comprehensive example in this country of American methods carried out on a large scale. For that reason we have published the complete set of steel frame plans of the building, and though some of our readers not directly concerned or able to appreciate the economical design of steelwork have thought we were devoting too much space to them, we have the satisfaction of knowing that these plans of the first complete steel skeleton building in London have received the most careful examination and the approval of well-known architects and engineers.

The Planning.

As regards the general planning there is not much to be said. The architects of the hotel are Messrs. Mewès and Davis and John P. Bishop (consulting). Mr. Mewès is a well-known Parisian architect who designed the Palais des Congrès at the Paris Exhibition of 1900, was engaged as decorator of the Carlton Hotel, London, and in 1898 was responsible for the design of the Ritz Hotel in the Place Vendôme, Paris. His influence, naturally, is noticeable as departing somewhat from English custom in details, but on the whole the plan conforms to recognised standards in hotel design. In the basement there is a banqueting hall, with reception rooms and private dining gallery, reached by a special staircase. The lower ground floor is devoted to the service, containing the kitchens and dependencies. Upon the ground floor are the entrance hall, grand gallery, staircase, lifts, managerial offices, restaurant, Marie Antoinette dining room and winter garden with shops on the Arlington Street and Piccadilly fronts, while the upper floors are devoted to suites of apartments consisting of reception (or sitting) rooms and bedrooms. There are over 150 bedrooms and salons, and about 75 bathrooms. The rooms are arranged in suites, comprising sitting-rooms, two bedrooms and two bathrooms with separate lavatories, the bath and dressing rooms being larger than is common even in first-class hotels. Each suite is shut off from the main corridor by its own private lobby.

The hotel was intended to cater for first-class custom, and the appointments and planning have been so designed. It is, undoubtedly, one of the handsomest and best arranged hotels in London.

The arcade is to be noted as a feature of the external treatment and as a precedent in street widening. There are, unfortunately, few such arcades in London. They offer such obvious advantages that it is surprising they have not more often been adopted.

The Ritz Hotel we think reflects credit on all concerned in its erection, not only upon the architects, but upon the general contractors, the Waring White Building Co., Ltd., and also Messrs. Waring & Gillow, who have been responsible for the decoration and furnishing. The contractors were faced with many difficulties, and were carrying out a form of construction novel in this country; yet, not only have they met these difficulties triumphantly, but have completed the building quickly. The decoration and furnishing is in keeping with the high reputation which Messrs. Waring & Gillow have created, and we feel inclined to say that the hotel is better appointed than any at present existing in London.

The Construction.

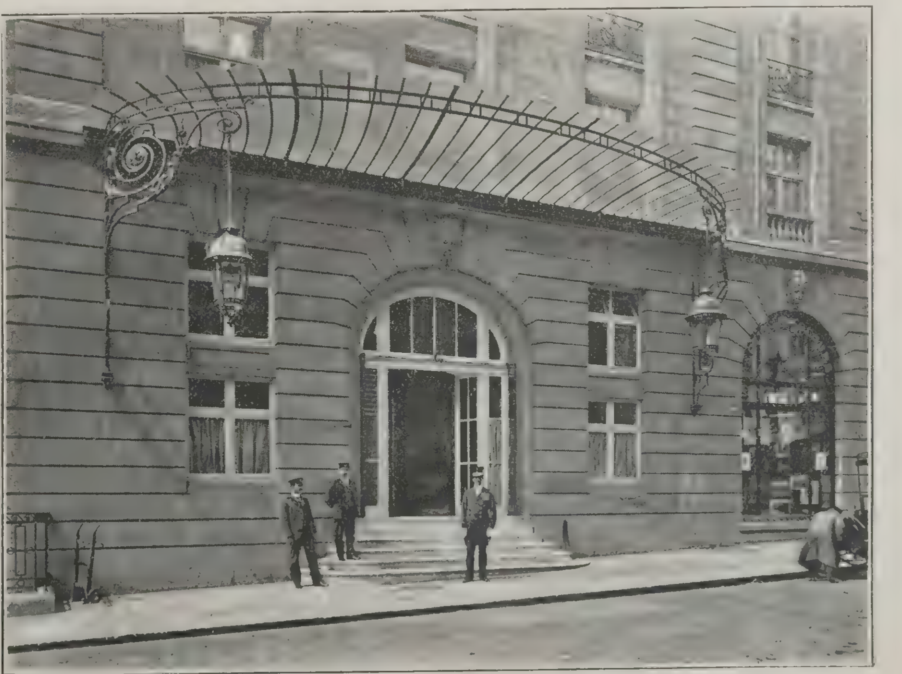
The articles before referred to in which the construction has been dealt with appeared in our issues for September 28th and November 2nd and 30th, 1904; March 1st and 22nd, April 12th, May 24th, and September 13th, 1905; and January 10th and April 18th, 1906. These articles contain, as stated, the working drawings, the photographs of the building in various stages of construction, and notes by the contractors' engineer who is responsible for the design of the steelwork, Mr. S. Bylander.

From the first the job showed features of novelty. Some readers may recollect that upon the site where the hotel now stands there was a large block of offices called Walsingham House. This had been built only a few years before, and, as was customary at that time, the foundations took the form of a raft of concrete. This raft was about 3ft. thick and of good material, and consequently opposed considerable resistance to ready and economical excavation. The contractors quickly found that this could not be removed adequately by the ordinary methods of splitting with wedges and hammers, so they had resource to

Blasting.

Pneumatic drills were used for boring the holes to receive the charges. They were of the Chicago rock drill pattern and consumed only 42 cub. ft. of free air per minute. The weight of each drill was 50lbs., and it was easily operated by unskilled labour with perfect safety. Cartridges with small charges were used for blasting in order to avoid any danger of disturbance, and the concrete was broken off in small lumps easy to handle. To avoid splinters flying about, the portion of work to be blasted was just covered over with a tarpaulin before the charge was exploded. The result was that the work of excavation was done in one-twentieth the time that would have been required to do it by hand.

The excavation work was in other respects simple; carts were run down an inclined way, the site being of sufficient area to avoid any necessity for using cranes to lift the excavated material.



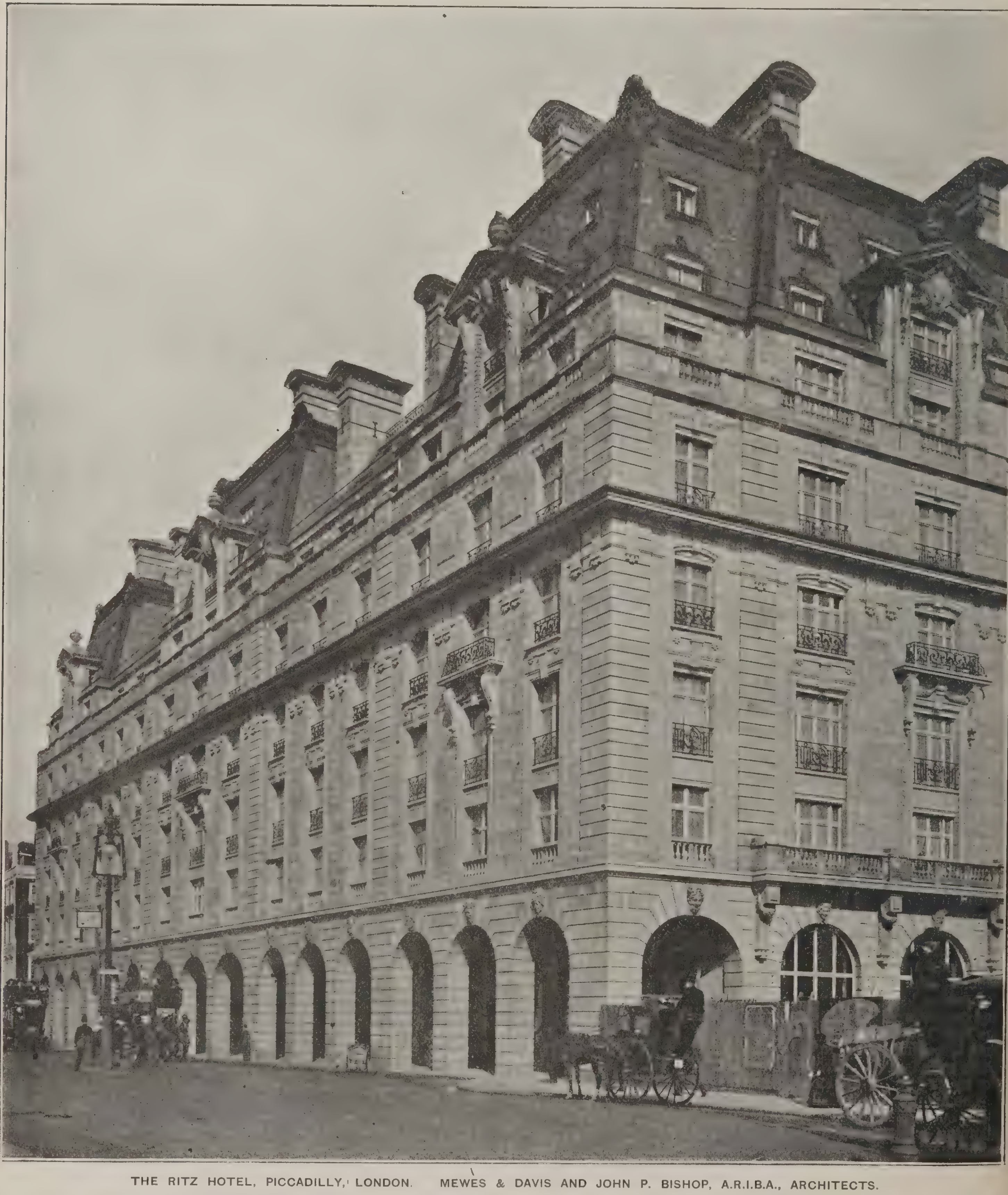
MAIN ENTRANCE TO RITZ HOTEL IN ARLINCTON STREET.

The Main Frontage

of the hotel is on Piccadilly. It is bounded at one end by the Green Park, at the other by Arlington Street. The length of the Piccadilly frontage is 231ft. 4½ins.; that of Arlington Street, 115ft. 2¾ins.; and the frontage to the Green Park, 87ft. 1⅛ins. The angle of the building lines between Piccadilly and Arlington Street is 83° 3′, and to Piccadilly and Green Park 96° 36′, as shown on the site plan published in our issue for November 2nd, 1904. The area of the site is about 23,200 sq. ft., and the area of the ground floor 22,000 sq. ft. The average area of each of the upper floors is about 19,000 sq. ft.

The finished floor level of the ground floor of the hotel, which was used as a datum, was 1ft. 6ins. above the pavement level at the main entrance on Piccadilly. The basement floor is 22ft. 7½ins. below the ground-floor level. Part of the building has a mezzanine floor between the basement and ground floor, this being called the lower ground floor. Above the ground floor there are seven floors.

On the Piccadilly and Green Park fronts the roof slopes at an angle of 75° and extends from the sixth floor to the level of the flat roof, which is 98ft. above the ground-floor level. Owing to the trouble of ancient lights, the roof at the Arlington Street side was made sloping from the



THE RITZ HOTEL, PICCADILLY, LONDON. MEWES & DAVIS AND JOHN P. BISHOP, A.R.I.B.A., ARCHITECTS.

THE ARCADE.

fourth floor at an angle of 45°. Along the Piccadilly frontage there are 3 pavilions, the highest point of which is 114ft. 6ins. above the ground-floor level.

The cubical contents of the building is about 2,413,000 cub. ft.

Steel Frame Construction.

The building differs in no essential particular from the regular American steel frame or so-called skeleton or cage construction. All loads, inclusive of exterior walls, are carried on beams and girders to the stanchions and the grillages.

With the steel frame building it is, of course, of the utmost importance that the setting-out should be of great accuracy, because the steelwork being prepared away from the job must come together exactly when erected. With the Ritz Hotel the site was too large for accurate surveying in the ordinary way with the chain, and the theodolite had to be used. The exactitude required, however, is an advantage in another way because it enables work of all kinds to be prepared in advance with the certainty that it will eventually fit into place without any cutting about. Thus all the dimensions for the granite and stone work were taken from the steel drawings in the preliminary stages of the work, and the masonry prepared at the quarries.

The Foundations

for the Ritz Hotel do not consist of the concrete raft which, as we have said, was the former practice for large buildings, but they conform to ordinary American practice with regard to steel buildings. All the foundations are independent—*i.e.*, the foundation under each stanchion is proportionate in area to the load it has to sustain and consists of grillages of steel joists embedded in concrete. In view of the erection of the steelwork independently of the brickwork or masonry, and its serving as a scaffold for the building, care had to be taken in the design for bracing during erection.

The Front Walls

facing Piccadilly, Arlington Street and the Green Park are of Norwegian grey granite up to the first-floor level, and Portland stone above, all with brick backing. Notwithstanding the fact that all the external walls are supported on the steelwork, and that a special concession was obtained for the construction of the building on this steel frame principle, the absurd requirements of the London Building Act as regards the thickness of walls had to be adhered to. They are, therefore, 39ins. thick at the street level, and 14ins. at the sixth floor level.

The Main Stanchions,

upon which the loads are transmitted to the foundations, are placed in straight lines square with the Piccadilly building line wherever possible and as far as architectural requirements have allowed. Care was taken to place them so as to allow for easy erection. The stanchions are supported at the basement level on cast-iron bases, averaging 3ft. square, these bases, again, resting on the steel and concrete grillages before referred to. Underneath the grillages there are concrete footings about 18ins. thick, and placed in pockets excavated in the clay, about 5ft. 6ins. deep below the basement level. The average size of the grillage foundations is 12ft. All the grillages of the beams are braced and kept apart by ¾in. thick cast-iron separators, and tied together with ¾in. diameter bolts.

In Figuring the Sizes of Footings

the dead load only was considered in order to secure uniform settlement, if any, and the following assumptions were made in their calculation:—

Weight of brickwork laid in cement mortar - - - - - -	120lbs. per ft. cu.
Ditto granite - - - -	170 ,, ,, ,,
Ditto stone - - - -	150 ,, ,, ,,
Ditto floors, inclusive of steel -	100 ,, ,, ,,
Weight of steel columns . . .	calculated from quantites.

As the total dead load of the floor only amounts from 80lbs. to 90lbs. per sq. ft., about 10% of the live load was included in figuring the floor load on the footings, this being estimated to allow for the weight of terra-cotta partitions, pipes and ducts. The sizes of the footings were calculated to the conservative figure of 5,000lbs. per sq. ft. The stanchions are figured for the full dead load, and 80% of the live load. Girders and beams are figured for the full dead and live loads.

The connections between beams and girders, and girders and stanchions were made as far as practicable in proportion to the loads they had to carry. With very few exceptions, the connections were all riveted. The rivets were determined to carry the loads, and no beam was milled at the ends to fit the lower flange of the beam on which it is resting, as usual in English practice, but strong connections were used to keep the beams supported laterally, and to transfer the loads centrally to the beams.

GRANITE BLOCK AT QUARRY READY FOR SHIPMENT.

In Calculating the Stresses

in the steel, a factor of safety of 4 was adopted. The fibre stresses allowed were:—

16,000	lbs. per	sq. in.	for rolled beams and girders.
15,000	,,	,,	,, riveted works.
20,000	,,	,,	,, bearing for rivets.
10,000	,,	,,	,, shear for rivets.

The Steel Stanchions Used

are of the closed cross-section type, consisting of two 12-in. channels and 14ins. wide cover plates, except on the upper floors, where two 12-in. channels latticed were used, as the loads were less. All the steel stanchions were designed for concentrated and eccentric loads. In the cases, however, where the eccentric loads were very small they were taken as eccentrically loaded, but a fibre stress of 12,000lbs. per sq. in. was used. For eccentrically loaded stanchions a maximum combined stress of bending and compression of 14,000lbs. per sq. in. was allowed. Calculations for eccentric loading, however, are seldom made in English constructional steelwork design, as they should be.

The outside dimensions of the stanchions were kept practically constant. The cross-section, however, was changed by using channels and plates of different thickness.

DETAIL OF BALCONY FACING THE GREEN PARK.

By this method fifteen different sections were adopted. Where very heavy loads had to be carried, the section was strengthened by adding reinforcing plates riveted to the back of the channels.

The area of the heaviest stanchion section is 142 sq. ins. Above the second floor the sections are reduced to two-channel type. All stanchions were made in two-storey lengths and spliced at a distance of about 1ft. 6ins. above the floor level, their sections being changed at each splice to correspond with the load they were intended to carry. Both ends of the stanchions were milled, and in the splice a cap-plate or horizontal diaphragm of exact dimensions was bolted to the stanchion with angles. This cap-plate gives a good bearing for the stanchion above. The upper sections were secured to the lower by field-riveted vertical splice-plates.

Cantilever Foundations.

Owing to the heavy external back walls and the limited area available for foundations, recourse has been had to what is distinctly a novelty in this country, although it has been a good many times adopted in America. We refer to cantilever foundations. It may be explained that, where in America it has been deemed undesirable to enter upon neighbouring ground and underpin adjoining buildings, foundations have been placed on the building owner's land, and the walls adjoining neighbouring buildings supported beyond these foundations by means of cantilever beams. These cantilevers where they come over the foundation rest on steel pin rockers upon cast-iron bedplates. The object of the rocker is, of course, to cause the transmitted thrust to be vertical on the foundation, and obviate the risk of the latter being subjected to an inclined thrust, which might cause damage—a contingency that is not unlikely to occur, as natural settlements must take place in every building. In our issue for March 22nd, 1905, a method of calculating the cantilever girders was given.

Trusses

At the Green Park end on the ground floor there is a large restaurant, and the desire to secure this floor area free from obstructions led to a somewhat complicated piece of steelwork design in the floor above, trusses being adopted so as to take the loads from the stanchions situated in the centre of the span. A view of these was published in our issue for March 1st, 1905.

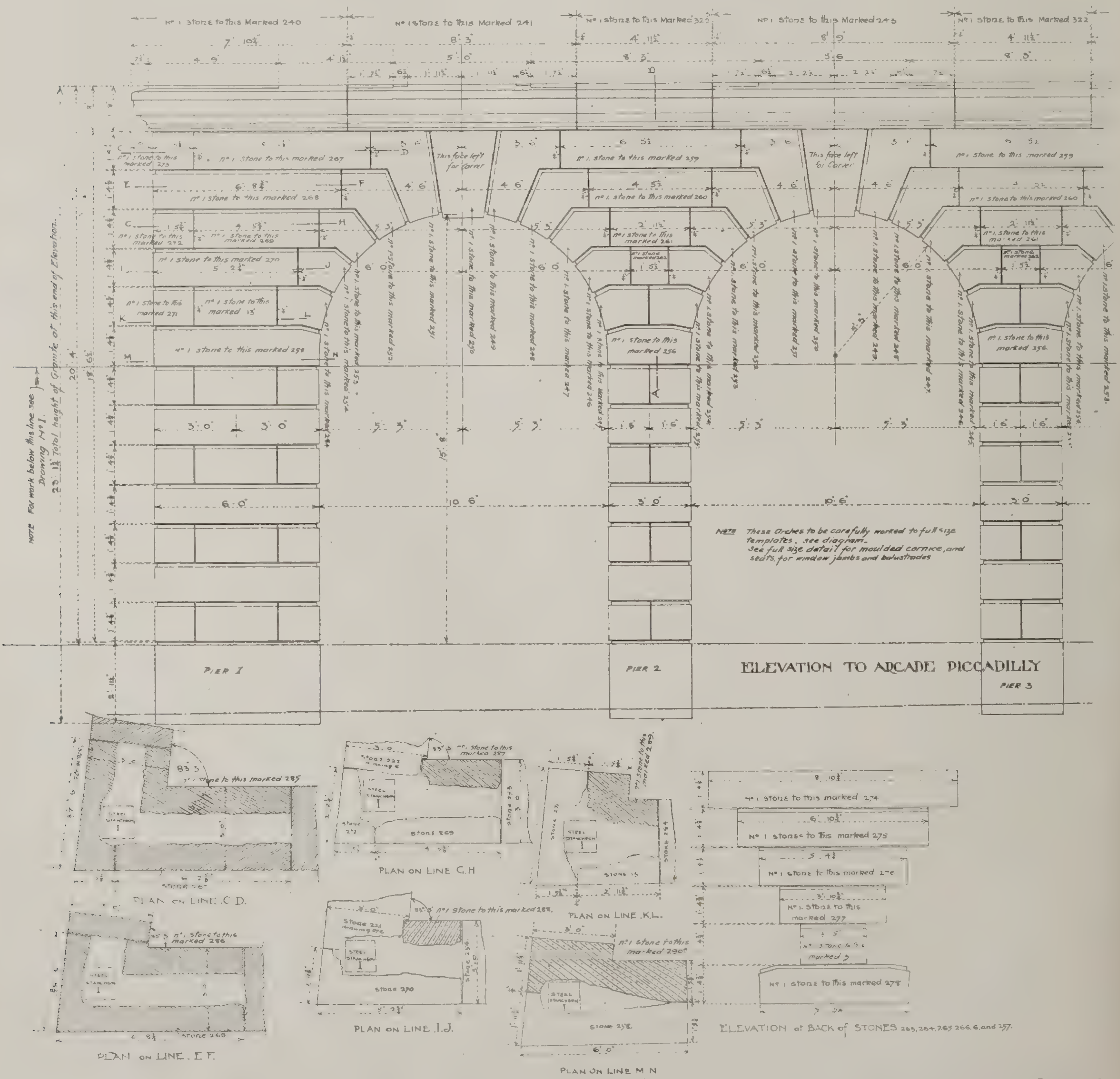
In each of the corner pavilions water tanks are placed and the construction supporting them is, where necessary, braced by diagonal rods with turn buckles.

The Chimney

from the kitchen is a steel one with a fire-brick lining. Inspection joints are provided for each floor level, and brackets keeping the chimney in place are allowed to slide upon their supports. The space between the steel flue and the walls is used for ventilation.

American Derricks.

In the erection of this hotel one striking feature was the use of American derricks.


ELEVATION TO ARCADE PICCADILLY
PIER 1
PIER 2
PIER 3
NOTE These Arches to be carefully marked to full size templates. see diagram. See full size detail for moulded cornice, and seats for window jambs and balustrades
NOTE For work below this line see Drawing Nº 1
This face left for Carver
PLAN ON LINE C.D.
PLAN ON LINE E.F.
PLAN ON LINE G.H
PLAN ON LINE I.J.
PLAN ON LINE K.L.
PLAN ON LINE M N
ELEVATION of BACK of STONES 265, 264, 265 266 & and 257.

NOTE.—The figured dimensions must in all cases be taken in preference to the scale. The whole of the exposed face to be fined-axed. All joints to be fine-axed and perfectly true. Where figured dimensions are given on the beds they must not be exceeded, but may be less. The dimensions given on the faces and joints must be strictly followed. All the stones when worked must be numbered with the number given on the plan in black on one of the joint sides. The faces must not be marked.

DETAILS OF GRANITE WORK: PART OF ELEVATION OF ARCADE TO PICCADILLY, ARLINGTON STREET END.

Each of these has a mast supported by guys, with a jib-boom somewhat shorter than the mast so as to work round under the guys, thus enabling the derrick to be turned round so as to distribute material round a complete circle. The wire hoisting rope runs through the base of the derrick, so enabling the machinery to be placed from the first in one fixed position in the basement and the derrick moved up floor by floor as required. A somewhat similar kind of derrick was also used for lifting subsidiary materials on to each floor, the mast in this case being attached at base and head to the steelwork.

Numbering System.

A special feature was made throughout the job of the system of numbering pieces of the steelwork, so that they should be readily found when they were received from Germany, and with a view of avoiding mistakes and saving time and trouble. Endeavour also was made to standardize brackets and other parts of construction wherever possible, so as to economise.

A Very Large Number of Drawings

was necessitated by reason of the great elaboration to which the design of the steelwork was carried. Thus there were:—

222 drawings measuring 40ins by 27ins.
516 .. .. 28 .. 14 ..
1,299 .. .. 14 .. 9 ..

thus totalling 2,037. The total amount of blue printing paper used has been approximately 13,000 lin. ft., 30ins. wide.

A SITTING ROOM.

The number of drawings required shows that the system adopted was expensive in the engineer's office, but it is evident that money was saved and better work obtained than would otherwise have been the case; on the whole making a considerable saving.

It is interesting to note that in the whole building there are approximately the following pieces of steelwork used:—

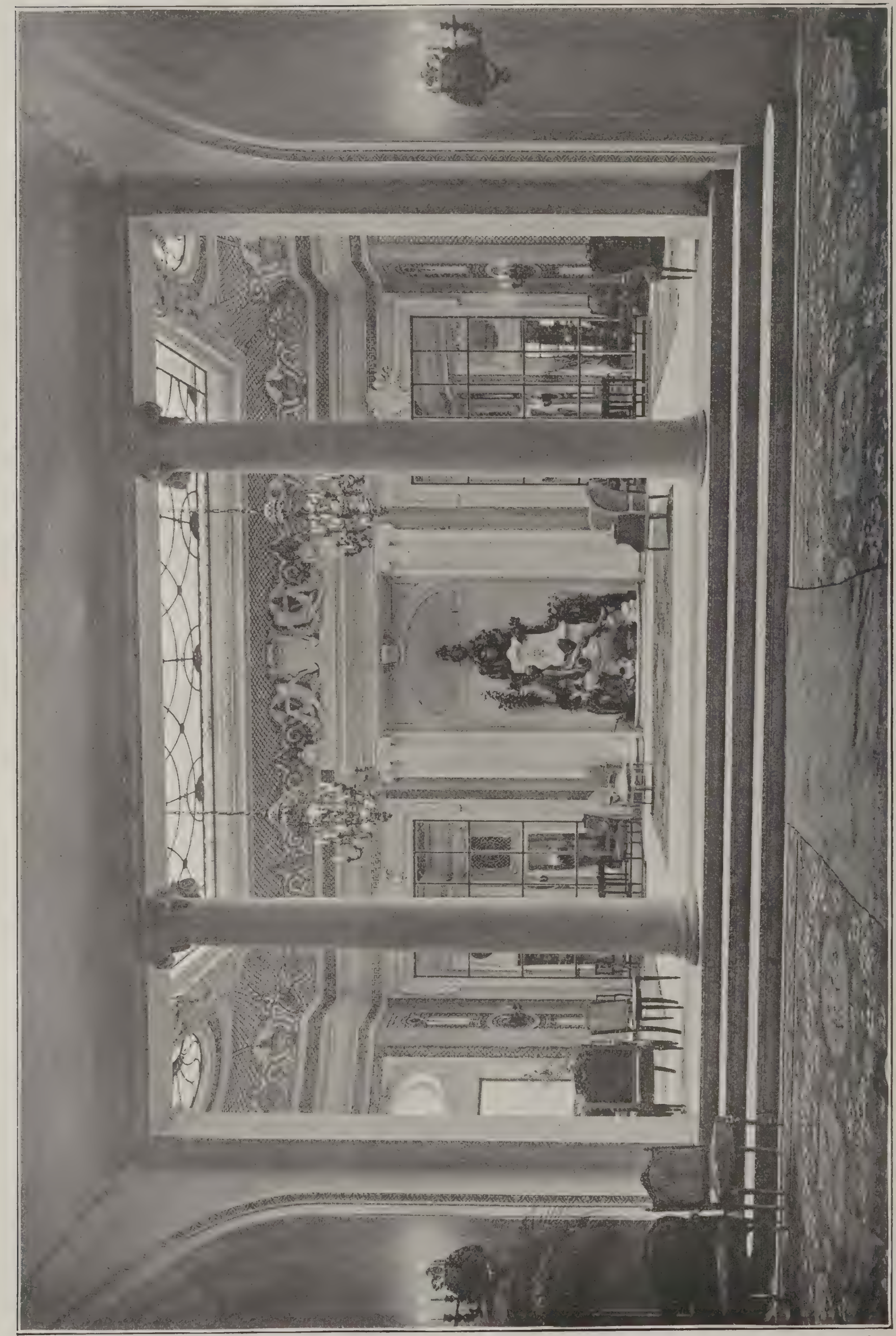
Beams	5,200	Trusses	3
Stanchions and Struts	550	Cast-iron separators	4,000
Plate Girders	55	Field Rivets	44,000

Granite.

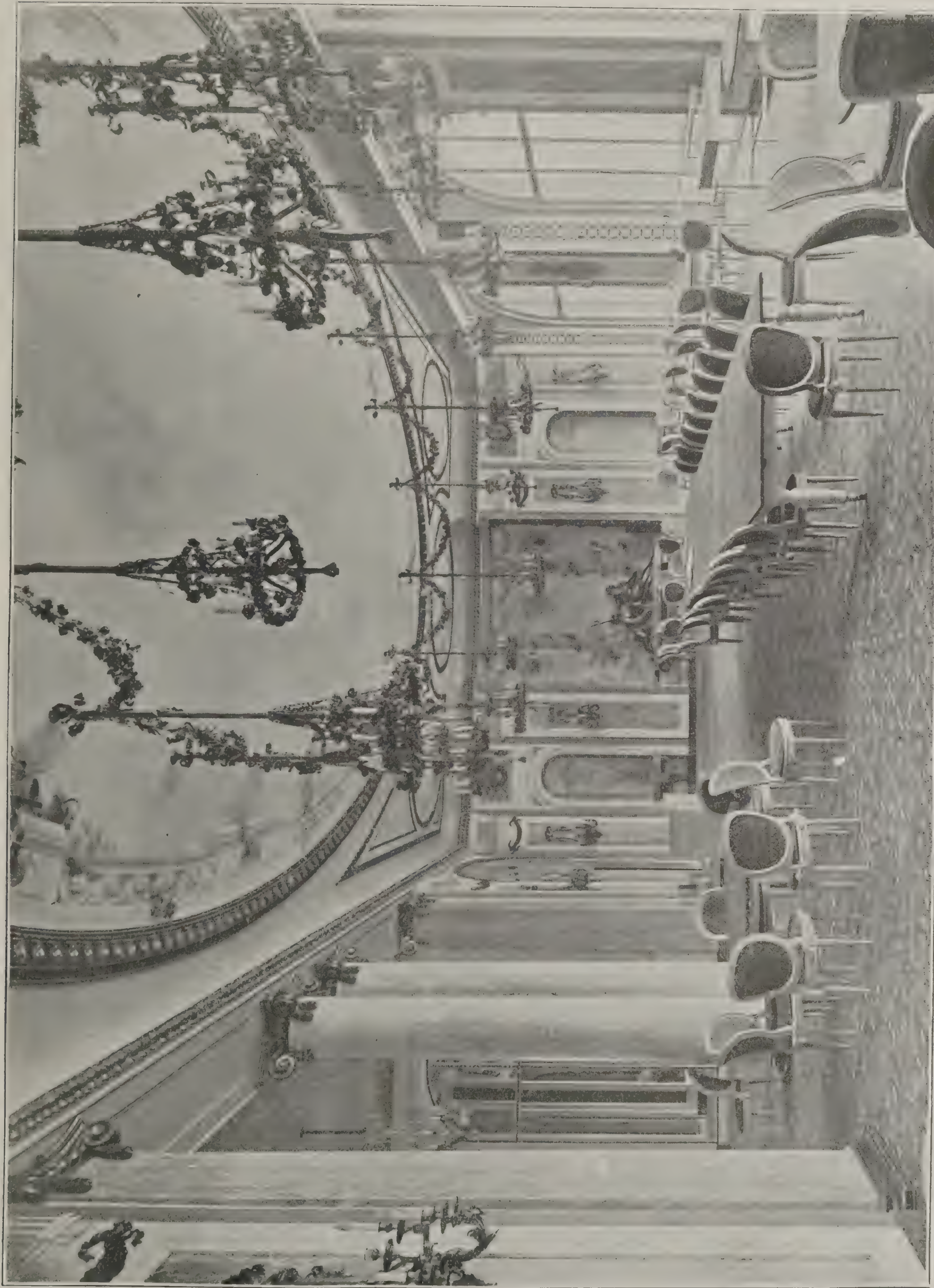
A notable feature of the exterior is the granite work, especially to the arcade on the Piccadilly front. It is carried out in Norwegian granite of the variety known as "Standard Grey," this granite having been selected on account of its excellent wearing qualities, good colour and regular surface. There are 17,000 cubic feet of this granite in the hotel, all of which was worked in less than five months and erected in the short space of twelve weeks. The keystones to the arches are embellished with carved heads, designed by a Parisian sculptor; these are very effective as executed. On the Green Park front of the hotel is a balcony over the restaurant, also carried out in granite, with strong corbels supporting it.

The system of carefully detailing the drawings in the case of the steelwork we have already referred to as facilitating the preparation of other work in advance, and the fact that the granite, like the steel, was worked abroad, led to drawings being carefully got out. We reproduce a portion of one of the drawings of the front to Piccadilly at the Arlington Street end, so as to show the general character. The dimensions were carefully taken from the architects' and engineer's drawings by Messrs. Manuelle, who submitted the detailed drawings to the architects for approval before sending them to Norway. The details were worked out from the $\frac{1}{8}$th scale elevations. The jointing was in great part left to the firm, who have a permanent representative at the quarry to check every measurement according to the drawings, and pass each block before shipment. The sections on this working drawing show the manner in which the backs of the blocks had to be cut out to fit round the steel stanchions.

MAIN STAIRS.



THE WINTER GARDEN



THE RESTAURANT.

The Ritz Hotel, Piccadilly, London. Mewès & Davis and John P. Bishop, Architects. Waring-White Building Co., Ltd., General Contractors. Waring & Gillow, Ltd., Decorators and Furnishers.

The small photographic view on page 3 shows such a block at the quarry placed ready for shipping. It will be seen how the back has been cut out. The casing is of course necessary to prevent damage. It is a point of interest in connection with this work that the difficulty that existed at one time with regard to the labour of carving granite is now in great part overcome by the adoption of pneumatic tools; the keystones were worked in this way, being finished however by hand. The granite employed for this building is peculiarly adapted to carving as it is easy in working and, consequently, economical and to be obtained quickly.

The Fire-Resisting Floors.

In these days of huge hotels where several hundreds of visitors are in residence daily, it is of the utmost importance that the building should be rendered secure against any possible danger from fires. Visitors to the Ritz, however, may reckon on immunity from any such danger, as every precaution has been taken in its construction to employ efficient fire-resisting floors and roofs.

The entire floors and roofs of this building have been constructed on the Columbian system of reinforced concrete, and are models of what floors and roofs for such a building should be.

Almost the whole of the floors at the Ritz Hotel were constructed before the outside walls were carried up, the very latest methods of construction being adopted to enable the building to be completed within a reasonable limit of time, and, although the contract was largely extended, the floors and roofs were completed well within the specified time.

The method of constructing the floors was to first erect centering between the girders carrying the span of floor and then suspend the steel bars between the girders by steel stirrups hung over the top flanges of the girders, the length of leg of stirrup being regulated so as to allow at least ¾in. thickness of concrete under the bars. The concrete was then filled in to the requisite thickness and tamped in position, the underside of girders being protected by slabs of concrete secured to the bottom flanges of girders with concealed anchors.

The Columbian floors at the Ritz Hotel are of what is known as "double construction," which is used when the ceiling is required to be kept at the same level throughout, or where a perfectly sound-proof floor is required. The rolled steel joists carrying the floors do not show below the ceiling line, but an independent ceiling is formed by laying 1in. Columbian bars on the lower flanges of the joists and embedding the bars and

CHIMNEY-PIECE IN SITTING ROOM.

THE BANQUETING HALL AND BALLROOM.

A BEDROOM.

bottom flange of joist in about $2\frac{1}{2}$in. thickness of concrete. The spans of floors so constructed do not usually exceed 7ft.

This form of construction is particularly suitable to such a building, combining as it does strength and fire-resisting qualities, and being also free from vibration and absolutely sound-proof. This last quality is by no means the least important, as it ensures freedom from the irritating noises commonly inseparable from buildings of this class. In addition to the above advantages, the double-construction floors have been employed at the Ritz Hotel as a ventilating agency, the foul air being carried into the space between floor and ceiling through inlets in the ceilings, and from there out into the open by air ducts. This space between floor and ceiling has also been used for the carrying of pipes, electric cables, &c., a slab being inserted in the floor to allow for easy access to pipes when required.

The Roofs

have also been constructed throughout on the Columbian system of reinforced concrete, and the adaptability of the system is well illustrated by the variety of windows, dormers, &c., in the roof.

Fireproof Partitions.

The fireproof partitions throughout the hotel are constructed of porous terra-cotta blocks, which are largely used in America in connection with steel-frame buildings, and have recently come extensively into use in this country. Hollow porous terra-cotta is an excellent material for interior walls for steel-frame buildings, by reason of its lightness and sound-proofness. The blocks are 12ins. square and of three thicknesses, namely, 3ins., $3\frac{1}{2}$ins. and 4ins., the 3in. being the size mostly used. Each block weighs 10lbs. They are very quickly erected, and are easily cut to fit corners or bends. At the skirting level blocks of a more porous or softer nature are used so that woodwork can be nailed to them. Each block has three air-spaces running through it. The partitions have been plastered with selenitic plaster and finished with Keene's. The setting-out of them, tried as an experiment, was done by the superintendent, the lines of the partitions being marked with a trowel upon a coat of rough plaster put on the concrete floors. This plaster set quickly, and the marks were then indelible and not to be obscured by traffic of men and barrows, as chalk would have been, thus facilitating the work and securing accuracy. These same partition blocks were also used as coverings to protect the steel columns, in case of fire.

Fire-Resisting Glazing.

On all floors in all the windows looking on to the five light-wells, including the windows to bedrooms, bathrooms, &c., fire-resisting glazing has been fixed; also in all the doors of the passenger lifts, all the doors opening on to the fire-escape staircases, the ceiling-light in the circular light-well, and in the doors and screens of the secondary staircases.

Asphalt.

The asphalt work amounted to more than 35,000 sq. ft. The roofs which were covered with asphalt present many features of interest, being at various levels.

The Decoration and Furnishing.

The whole of the internal decoration, furnishing and fitting has been carried out in the Louis XVI. style. The artists have been inspired by the works of De Neufforge, Boucher fils, and Lalonde, as well as by the prints of Moreau the younger and St. Aubin. The well-known firm of Messrs. Waring & Gillow have been responsible for the whole of the decoration and furnishing of the hotel, and the following is a summary of the chief points of interest in their so eminently successful work:—

Over the entrance to the hotel in Arlington Street there is a wrought-iron marquise, shown on page 1. This leads to the Grand Gallery, at the Green Park end of which is the entrance into the Restaurant. On the right and left of the Restaurant entrance are placed two life-size figures in bronze vert, after Clodion, holding gilded bronze lustres with six lights each, and mounted on pedestals of polished Echaillon stone, ornamented with bronze.

To the right of the entrance to the Restaurant is a private dining room called the Marie Antoinette Green Room.

The Grand Gallery itself, which runs the full length of the hotel from the entrance of the Restaurant, is vaulted and built of stuc pierre relieved by massive gilt bronze fittings, balustrades and doors, and forms a pleasant lounge. The floor of this Gallery is carpeted with specially made hand-woven "Savonnerie" carpets.

The Winter Garden, which lies to the left of the Grand Gallery at the back of the site, is divided from the Gallery, as shown in one of our views, by two Ionic columns. The decoration is rich; the walls are faced with greyish white Echaillon stone, surmounted by a rich cornice, while the glass roof is supported by a

A BATHROOM.

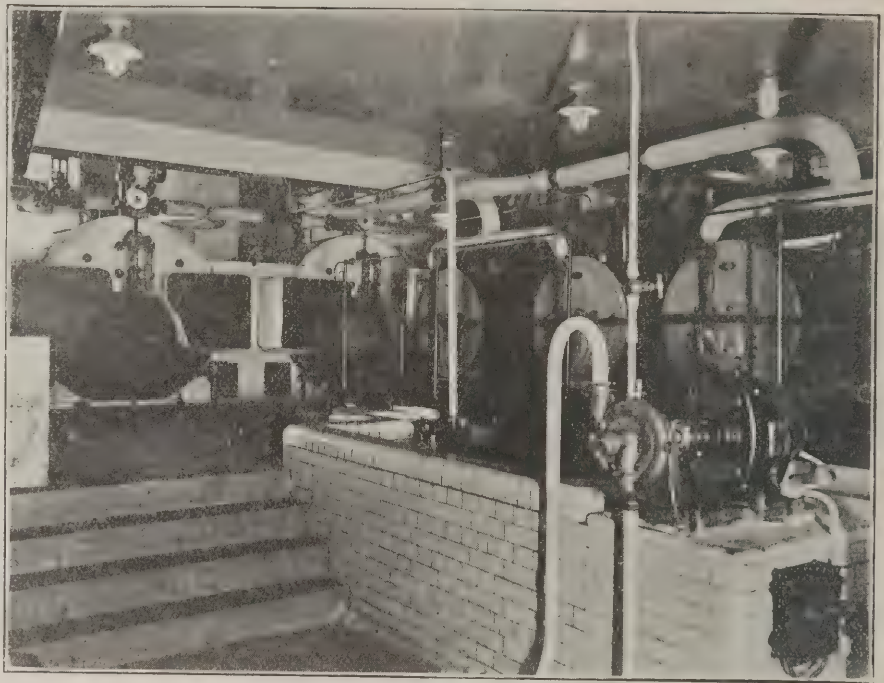
wrought-iron framework, from which depend two lamps in the same metal, gilded and adorned with painted foliage and flowers. Above the cornice is a gilded trellis-work in eighteenth-century style. There are two large panels of twenty bevelled mirrors framed in gilt bronze. In the middle of the wall opposite the entrance is a decorative niche surrounding a Louis XVI. fountain, formed of rocks and allegorical figures. This fountain is in Echaillon stone with figures and ornaments in gilt repoussé lead, the subject being "La Source."

The Restaurant is also richly decorated, as will be seen from our view. The mural decorations are inspired by the works of De Neufforge, and the famous print, "Le Bal Paré et Masqué," by St. Aubin, has been followed for the lustres. Preceded by an atrium, the Restaurant forms a large square, in which 150 persons can dine.

The side of the Restaurant looking on the Green Park is composed of five large bay windows in the form of an arcade, in the bronze work of which are inserted *glaces sans tain*. Thus from every part of the room one has a pleasing perspective on the scenery of the Green Park. These bay windows, which can be turned back, lead on to the terrace, at the extreme right of which a staircase of twelve steps takes one to a garden, which is on a level with the Green Park. The ceiling is handsome, its chief feature being the painting of a blue sky with light clouds, which is surrounded by an oval gilt frame, and depending from it are the lustres, joined by garlands in gilt bronze.

The Marie Antoinette Room is decorated in the purest Marie Antoinette style, in green and gold, with panels framed in carved gilt wood.

The banqueting hall, reception rooms and private dining gallery in the basement —reached by a special staircase—are to be used for dinners, receptions and theatrical entertainments (a raised stage is fitted at the south end of the banqueting hall). The general decoration of these apartments is ivory white, and the dining gallery is fitted with mirrors, suggesting a series of intersecting vaults.



BOILER·HOUSE IN BASEMENT.

As regards the bedroom floors, each suite of rooms is differently decorated although the general scheme is the same; that is to say, the walls are painted and panelled in white, and the floors are covered with green and rose-coloured Persian carpets.

Plastering.

The plastering contract was an important one, running into several thousands of pounds, and it had to be executed with unusual skill and care on account of the nature of the decorations; moreover, time was a factor that had to be considered, as it was important that the opening of the hotel should not be delayed. Enquiry elicits the fact that this part of the work was done considerably under contract time, as in the case of the Carlton Hotel, also plastered by the same firm.

Viteous Tiling.

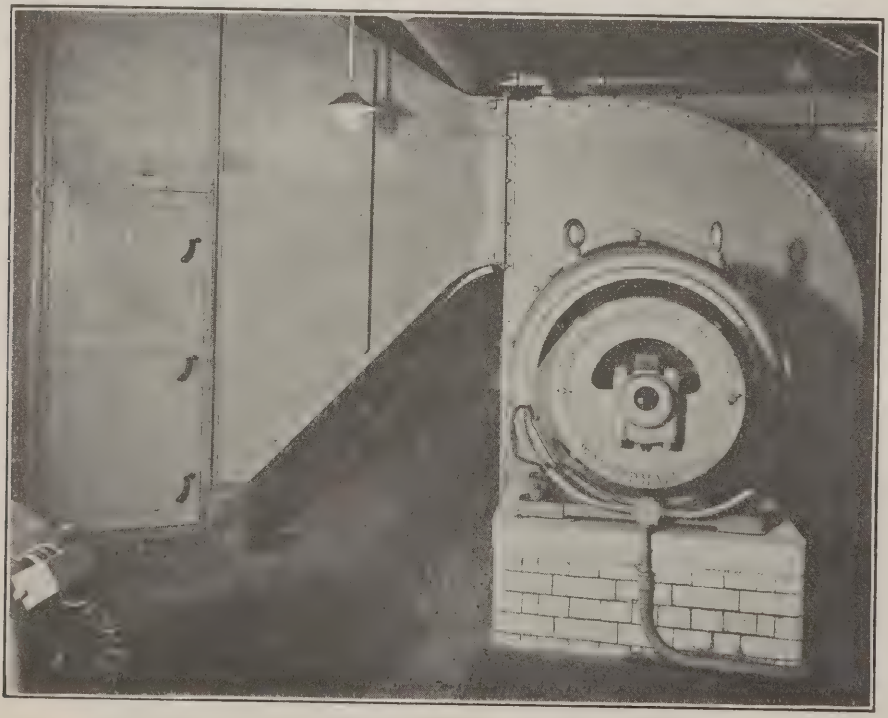
The greater part of the walls of some seventy-five bathrooms, lavatories, &c., are lined from floor to ceiling with vitreous tiles. White tiles with grass green frieze and skirtings of the very simplest patterns are used, but the whites are in some cases tinged slightly with pink and in others with green, thus giving a most artistic opal effect to the whole, whilst still retaining the severity of treatment which is so suitable to bathrooms, &c. These tiles seem to be growing greatly in favour with some of our best architects, and there is no doubt but that their absolute impermeability, excessive hardness, rich variety of colour, slightly matt surface and general artistic possibilities render them quite distinct from any other form of tiling on the market.

Locks.

The lock equipment of the hotel is entirely different from any other ever before furnished. All the locks are controlled by a grand master key, and each floor is in turn controlled by a separate sub-master key (chambermaid's key), each lock being different and controlled by its own change key (guest's key). Owing to the special features encountered, the locks were made for extremely narrow-stile doors and are operated by lever handles. Some locks are made with a double backset—that is, a keyhole on one side 1in. from the edge of the door, and on the other side 2ins. from the edge of the door. A special lock was constructed for the suites of apartments. When the lock is used on a door which leads to a sitting-room, the guest is able to actuate the lock by a lever handle on either side, but when it is used as a bedroom, by rotating the plug in the Yale cylinder in front of the lock, the outside lever handle is then fixed.

Heating and Ventilation.

The heating and ventilation is on the plenum system and has been designed by Mr. E. Wingfield Bowles, the consulting engineer to the hotel. The fresh air is driven into the building by means of a cased fan direct-coupled to two 25-b.h.p. electric motors dealing with over 1,000,000 cub. ft. of air per hour, or 6,700ft. per minute. Before being distributed to the various parts of the building this large



THE VENTILATING FAN.

volume of air is thoroughly washed and filtered, and is then perfectly free from fog particles, dust and other foreign matter.

In the winter the air is warmed by being driven through a steam battery, so arranged that the temperature can be accurately regulated according to the condition of the weather. By an ingenious arrangement of shutters and ducts with himidifying chambers, air of varying temperatures and humidity can be distributed through the network of air ducts to every part of the building. Thus while cold air is being driven into the kitchen, cool air slightly moistened can be delivered to the ballroom, warm air to the restaurant and winter garden, and air of another temperature to the sleeping apartments and sitting-rooms if required.

The vitiated air is carried away from the various rooms and corridors by three large electrically-driven fans capable of dealing with three-and-a-half-million cub. ft. of air per hour. The air inlets and extracts are arranged so that there is an entire absence of draught or noise due to the movement of such large bodies of air.

In the warm weather, in addition to the filtering screens, a spraying apparatus is utilised to cool the air as it enters the the building.

Water supplies are pumped up from the main intake tanks by two electrically-driven lift and force pumps capable of dealing with 80,000 gallons per 12 hours. Storage tanks for 20,000 gallons of water are arranged in the towers at each end of the building.

There are hot-water services from steam-heated calorifiers, which supply 6,000 gallons of boiling water per hour, and a complete system of fire services and hydrants and fire extinguishers on all floors, and a vacuum main, with connections, to all parts of the building.

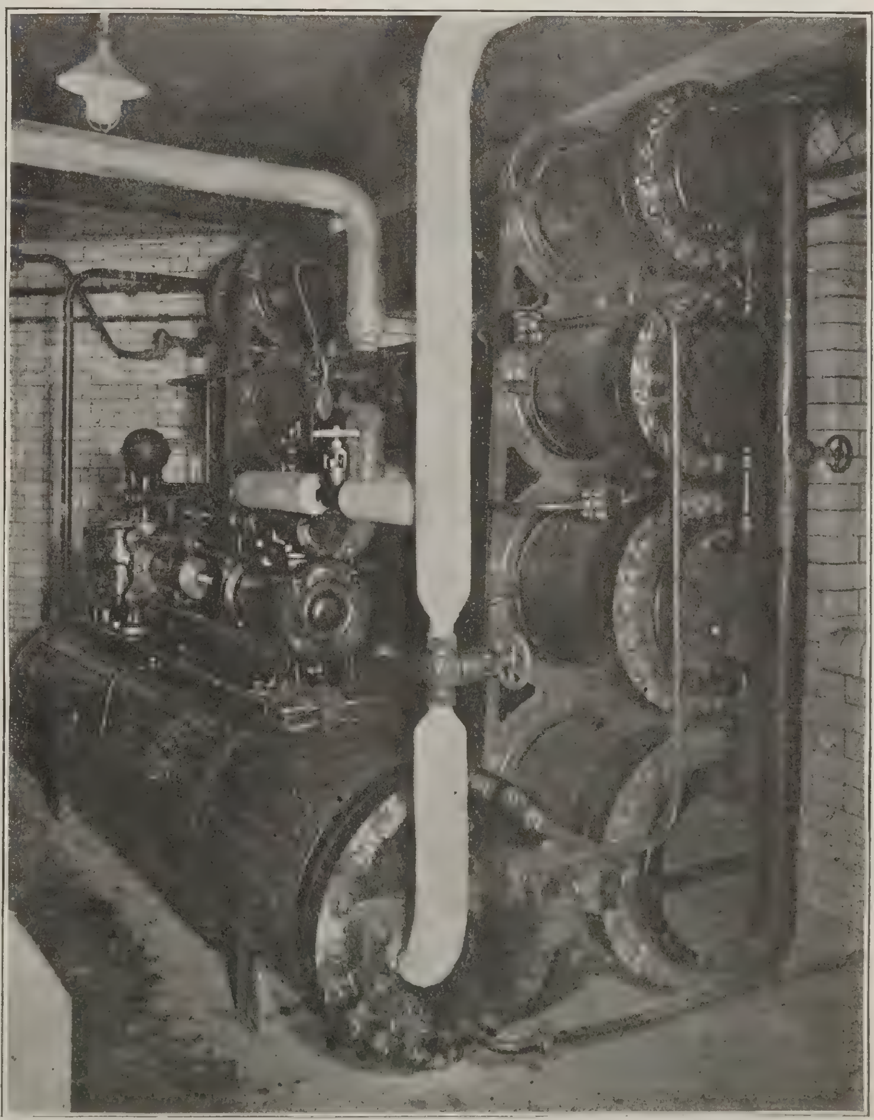
Boilers.

There are two steam boilers, each 12ft. 6ins. long by 6ft. 6ins. diameter, of the Economic type with one internal furnace tube and fifty smoke tubes extending the whole length of the boiler. From each boiler a steam service is carried off with connection on to a 4½-in. ring steam main so that either boiler can supply either side of the steam main. The two boilers are fed by means of duplicate-feed water pumps with duplicate-feed service pipes, and so arranged that either pump will serve either boiler.

The Kitchens.

The kitchens are marvels of the cooking apparatus manufacturers' skill and ingenuity. There is a large roasting range, 7ft. 6ins. high and 4ft. wide, fitted with a 30in. fire and electrically-driven jack and spits, which is capable of roasting a baron of beef or a quail. There are two large central cooking ranges and one side range with tiled canopies over; steam vegetable cooker containing twelve compartments, steam boiling pans for soup, a double charcoal grill, two salamanders, stock-pot stands, etc. There is a combination of eleven steaming closets fitted with gunmetal mounts; a series of thirteen hot closets for the serving rooms, seven being 5ft. by 4ft., five 6ft. by 4ft., and one 6ft. by 6ft. —all fitted with perforated shelves having wrought-iron steam coils and steam inlet valves, polished mouldings and wrought-iron sliding doors with gunmetal sunk handles; a combination of three serving tables and hot closets occupying nearly the full length of kitchen, about 50ft. long, heated with steam coils; a gas-heated stock-pot stand 4ft. long, 2ft. deep and 18ins. high; a gas boiling table 8ft. long, 3ft. 3ins. high and 2ft. 6ins. wide; gas toasters; central gas range; gas grillers, &c.

THE MAIN KITCHEN.



THE REFRIGERATING PLANT.

The range of steam-heated serving tables, a good view of which is shown on the preceding page, is said to be the longest in the world.

The Still Room

is fitted up with gas boiling tables, toaster for 100 rounds, automatic egg boilers, and long steam-heated serving table.

In the Bakery

a specially designed bread oven is erected in which the whole of the bread used in the hotel is baked at an expenditure of fuel of about 6d. or 7d. per day.

A similar oven, but designed for pastries, is built in

The Patisserie,

which is also fitted up with boiling ranges with specially designed concentric burners for chocolates and sweets.

The Twelve Serving Rooms

are each fitted up with steam hot-cupboards and all accessories.

Cold Storage Accommodation.

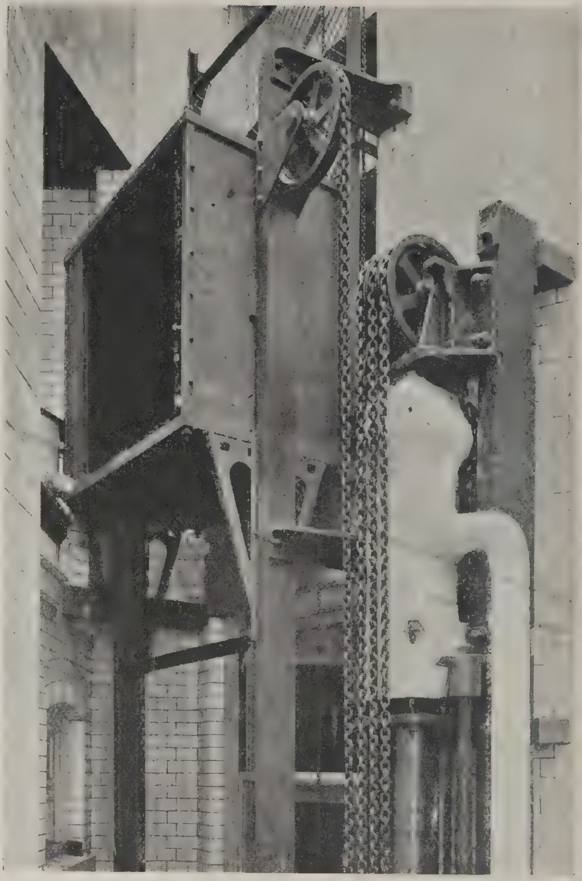
The cold storage accommodation comprises two large chambers for preserving meat, game, &c.

The distilled water ice-making, cold storage, and refrigerating plant is very complete. The plant consists of one of ammonia absorption machines, fixed in the lower basement, from which cold is distributed by means of brine, pumped through mains running through the entire length of the building by motor-driven centrifugal pumps, two being supplied in duplicate for this purpose, one as an auxiliary. The brine is cooled in a brine cooler placed by the side of the machine, the whole forming a very compact plant, and occupying very little space.

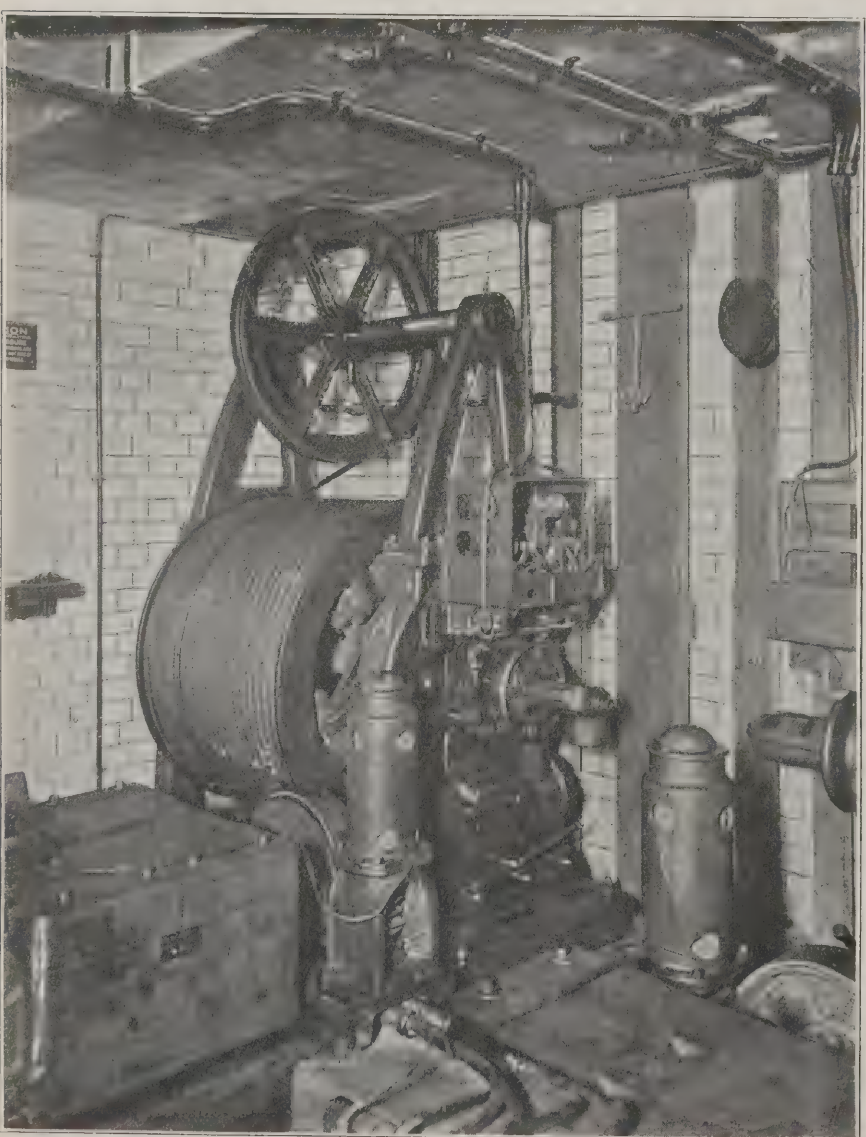
In addition to ice-making, the plant is used for cooling two large meat and game chambers; several hotel service cupboards; wine, beer, and mineral water coolers; and appliances for cooling drinking water. The two principal meat and game chambers are each supplied with their own air-cooling appliances, the air being circulated by means of motor-driven fans.

Sanitary and Plumbing Work.

The sanitary and plumbing work has been most successfully carried out, and as a specimen of modern up-to-date sanitary engineering will bear comparison with anything yet accomplished. Everyone now recognises the importance of efficient sanitary work, and this feature has been kept continually in view during the construction of the hotel. The building contains nearly 100 bathrooms and lavatories, luxuriously fitted up, besides staff accommodation. The ornamental leadwork on the roofs and dormers is also worthy of note, especially the covering of the stone carvings over the dormer windows, &c.



A KITCHEN LIFT.



ELECTRIC LIFT WINDING GEAR.

The whole of the sanitary fittings are of special design. The lavatories and baths are in white glazed fireclay, and the closets, a new pattern with valve, designed so as to be fixed without any enclosure. There is a bath, lavatory and closet to each suite of rooms.

Lifts.

The lift installation comprises two electrically-controlled passenger lifts, running one alongside the other in one shaft; one waiters' passenger elevator; one luggage elevator; three hydraulic goods elevators; and five push-button controlled electric dinner or service elevators equipped with electric floor position indicators.

Contractors and Sub-Contractors.

General Contractors - -	Waring White Building Co. Ltd.
Decoration and furnishing	Waring & Gillow, Ltd.

The following is a list of some of the sub-contractors who executed work at the hotel:—

Fire-resisting glazing	British Luxfer Prism Syndicate, Ltd.
Sanitary and plumbing work	Mellowes & Co., Ltd.
Lifts - - - - -	Otis Elevator Co., Ltd.
Plastering - - - -	Danville Asbestic Plastering Co.
Refrigerating machines and ice-making plant	Ransomes & Rapier, Ltd.
Tile mosaic in bathrooms-	Rust's Vitreous Mosaic Co.
Locks - - - -	Yale & Towne, Ltd.
Iron staircases, handrail and balusters - - -	St Pancras Iron Work Co., Ltd.
Slating - - - -	Allard & Co.
Granite work, marble work to bathrooms terrace steps, &c.	A. & F. Manuelle
Ventilating and boiler-house plant and kitchens	Richard Crittall & Co.
Portland stone - - -	Bath Stone Firms, Ltd.
Floors - - - -	Columbian Fireproofing Co., Ltd.
Electric lighting - -	Waring & Gillow, Ltd.
Boilers - - - -	Rosser & Russell, Ltd.
Partitions - - - -	National Fireproofing Co., Ltd.
Hardwood doors and wardrobes	Gillow & Co., Lancaster.
Reinforced concrete work to staircases, and paving work	Stuart's Granolithic Stone Co., Ltd.

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The Increase in Building Accidents. In the annual report of the Chief Inspector of Factories and Workshops for the past year, just issued, it is stated that, despite the facts that machinery is better fenced year by year, and that more precautions are taken, the number of accidents increases. Last year, in various parts of England, there were no fewer than 540 accidents with circular saws, 749 with cranes and lifting tackle, 195 with planing machines, 152 with hoists, and 36 with band saws. There are no figures given which enable one to determine exactly what class of building work has been most responsible for accidents, but on jobs it is evident that the hoisting of materials—stone, steelwork, &c.—embraces a large proportion. This, however, is not a necessary counterpart to the modern methods of erecting buildings. It is true that in cities nowadays a great rush goes on, with the object of getting the work completed at the earliest possible date, and that this rush entails many accidents: nevertheless, the fault is very often with the workmen themselves. Brick hoists, for instance, which are expressly stated on notices to be used for material only, will be used by workmen to save them the trouble of going up the ladder: with the frequent result that the hoist is overloaded and runs down, with perhaps fatal consequences. Then, again, it is not so uncommon to see men standing on cages or slings for material being lifted by the crane, airily waving their arms to the crane-man—a piece of sheer foolhardiness. In the Chief Inspector's report above referred to, Mr. Hoare, of the West London division, points out that there is a disposition to begin to remove scaffolding before the work on a section is complete, so exposing men doing touching-up work to unnecessary risk; though he adds that the scaffolding in large places in London always appears to be well done. Mr. Beverley, of the West London division, refers to the two cases of the failure of large Scotch cranes at work on the top of new theatre buildings. In both cases the injuries were fortunately not of a fatal nature. In the first case the main or king post of the crane came clean out of its socket. Either the bed-plate casting broke or, what seems more probable, the cotter holding the top ends of the posts together got loose and jumped out, as it was afterwards found in the débris. In the second accident the jib of the crane broke in half and fell on the look-out platform, knocking the man on to scaffolding 10ft. below. "Builders have a way of guessing the loads to be lifted. This is all very well with a small rectangular object, but when the material weighs several tons and varies in shape it should be measured up each time. Cornice stones are generally some of the heaviest loads to lift and here the variations in the mouldings alter the weight. At an inquest as to an accident caused by the collapse of a crane the builders' foreman said he got the weight of girders by measuring them, but, on being pressed, admitted he usually guessed them." There is indeed too much of this guesswork going on. Things are not properly tested at regular intervals, as they should be. When an accident occurs, this fact is elicited, and then the jury adds a rider, enforcing the obvious. The matter, however, drops out of notice without anything being done. Mr. Walmsley, of the East Cheshire division, reports the unusual accident (fatal) of the bursting of a circular saw. This saw was 36ins. diameter, driven direct from a motor. It was making 1,800 revolutions per minute, or a surface speed of three miles a minute, and it burst suddenly, throwing a piece to a distance of 300 yards. No flaw could afterwards be found in the pieces, and the only inference is that the saw had been overdriven.

The Congress. The Seventh International Congress of Architects is now in full swing, dividing its labours with its pleasures. Maybe (and we have more than a suspicion of it) the pleasures count first, and the commendable discussion on eclectics of architecture (commendable from a professorial standpoint) is not so much a feature to be remembered as the conviviality among architects of all countries, whether it be in the official purlieus of Conduit Street, the more æsthetic region of the Grafton Galleries, or surrounded by the glorious hospitality of the City's halls. Moreover, at this time of year, we have little doubt the excursions to our English beauty spots and centres of old architecture will hold the field against any academic meetings in the West-End. And we need not cavil about it. Our foreign friends have come here to see our buildings, old and new, and to meet our architects of most repute. In this respect the exhibitions of the Congress have a relative interest, and it is valuable to have a record of them. There are many publications in connection with the Congress, but by far the most interesting is the special number of The Architectural Review dealing with the exhibitions—a volume of illustrations of old and new architecture, with commentary articles by the best authorities. It is really a remarkable issue of the Review, an issue to be kept, as it brings together a collection of photographs never before attempted; it is, presented, too, in the best manner of the modern Press.

STRENGTH OF BRICKWORK AS DETERMINED BY EXPERIMENT.*

By W. C. Popplewell, M.Sc.

The object of this paper is, in the first place, to describe the manner in which experiments on the strength of brickwork are carried out in the materials testing laboratory of the Manchester School of Technology; secondly, to indicate the kind of results which are to be expected from these; and, thirdly, to quote several of the more important of the data which have been obtained here and elsewhere.

Testing Machine and Measuring Apparatus.

The machine used for making tests of brickwork and similar materials is a 900-ton hydraulic press, having a 20in. ram. In this machine the pressure of the water above the ram is shown on a pressure gauge. In order to allow for the effect of the friction of the cup leather, the weight of the ram and its attachments, and the upward pull of the side pistons which are used to lift the ram, a direct calibration has been made by which the load on the specimen can be calculated directly from the pressure, with a very fair degree of accuracy. The formula made use of is

$$W \text{ (tons)} = (p \text{ (lbs.)} - 34)\ 0{\cdot}139.$$

This formula has been obtained by means of a steel spring piece which had first been loaded in the Wicksteed testing machine. In this way the load in tons on the specimen can be obtained directly from the pressure in pounds per square inch.

The compressions corresponding to the loads are obtained by means of a Martens mirror apparatus. In this instrument changes of length of the specimen which is being loaded cause the rotation of a mirror, and the reflection of a graduated scale in this mirror, as seen through a telescope, is caused to appear to move across a fixed line in the diaphragm of the telescope. The difference in the position of this line on the scale is a measure of the change of length between two points a fixed distance apart. In the experiments here referred to two mirrors were used, placed on opposite faces of the pier, so as to indicate any inequality in the stress. The readings were taken on a length of 20 c.m. on the face of the brickwork, and readings could be read directly to 1-10,000th of an inch, and by estimation to 1-50,000th.

Tests with Piers.

The experiments which have been made include tests of piers of brickwork, tests of the bricks of which the piers were built, and tests of the mortar used.

All the piers tested have had a square section, 18ins. by 18ins., giving a sectional area of 2¼ sq. ft. Those tested up to the present have been 36ins. high, but three which have recently been built are 48ins.

The building of the piers has in all cases been carried out by working bricklayers. Some have been built in place on the lower platen of the machine, while others have been built on stiff squares of timber and moved into the machine when ready for testing. In all cases the top and bottom surfaces of the piers have been set either in neat Portland cement or in plaster-of-Paris, in order to distribute the load uniformly. This is an important point, and seriously affects the results of the experiments.

The various piers tested up to now include the following:—

One of common local wire-cut bricks, with lime mortar.
One of common local wire-cut bricks, with Portland cement mortar.
One of Accrington, with black mortar.
One of blue Staffordshire, with Portland cement mortar.
Six of blue brindled Staffordshire, with
  2 black lime mortar.
  2 Portland cement mortar.
  2 lias lime mortar.
Five of Accrington, with
  1 Portland Cement 1 to 1.
  1 ,, 2 to 1.
  1 ,, 3 to 1.
  1 ,, 4 to 1.
  1 ,, 5 to 1.

At first no special plan was adopted so as to systematise these tests, but now, for any set of piers built and tested, the idea of obtaining information on specific points is kept in mind. To the above must be added three piers recently built, but not yet tested. These are: One of blue Staffordshire, with Portland cement mortar 1 to 1; one of 2nd Accrington, with Portland cement mortar 1 to 1; one of 2nd Accrington inside, and faced with blue Staffordshire with Portland cement, with mortar 1 to 1. In the case of these last, the height is 4ft. instead of 3ft. Thus in all there are 18 piers, 15 of which have been tested.

The result of the first 15 tests have been already published and discussed in a paper published in the "Proceedings" of the Institution of Civil Engineers, clxi.

Relation of Stress and Strain.

The measurements taken with the Martens apparatus make it possible to express a relation between the stress and mean strain at any period of the loading.

This relation is conveniently expressed by a plotted stress-strain curve, which is similar to the curve obtained on the first loading of any material having the nature of soft stone, or mortar or concrete in which portions of a harder substance are set in a matrix of a different substance which is generally soft in nature.

This diagram may be divided into three portions:—

(*a*) There is a curved portion with the concave part upwards. This indicates a diminution of strain as the loading progresses, which may be caused by the spaces between the particles which form the substance being closed up.

(*b*) The second part of the diagram is straight, thus pointing to an elastic condition of the substance. This elasticity is not quite perfect, as there is generally found a little permanent set on the removal of the load. It is further found, when the specimen has been loaded and reloaded once or twice, that the permanent set is almost completely eliminated. From the readings taken during this part of the loading it is possible to calculate a value of Young's modulus (E). For the best kinds of brickwork (E) has been found to have an average value of about 125,000 tons per sq. ft., or 1,940,000lbs. per sq. in. This may be taken to mean that for the application of a stress of 1 ton on each square foot a wall or column of brickwork will be shortened 1-125,000th of its height. For example, in the case of brickwork 100ft. high, loaded with 12½ tons in each square foot, there would be a shortening, apart from its own weight, of 1-100th of a foot, or about ⅛in.

(*c*) At the end of the straight portion the line again becomes curved in the opposite direction from that of the first part. This indicates a growing increase of compression, and marks the end of the elastic condition. If the terminology used in the case of iron and steel be employed here, the point where this last curve begins may very well be called a "limit of proportionality" (P. limit). What is happening in the material after this point is passed is not very clear, but it may be thought probable that the particles, which, up to this point, have retained nearly the same relative positions, are being pushed further out of their places and a sliding movement is beginning to take place. It is very likely that this movement takes place first in the motar, and when this begins to move and fail, the even distribution of the stress on the bricks themselves must be changed, with the result that these begin to crack, and a general movement begins to take place throughout the brickwork.

Effect of Successive Applications of Load.

If a loading is carried just beyond where it has been called the proportional limit, the load removed, and then again applied, it is found that the measurements taken during the second loading plot on a straight line up to where the previous loading stopped. It would seem that the effect of the first loading is to press the particles permanently nearer together. The result is very like what is found to take place in similar experiments on some of the metals.

Cracking and Crushing Stresses.

In compressive tests of brickwork it is usual, apart from the elastic measurements, to observe and note the stress at which the first crack is seen or heard, and to call this the "cracking stress." The next and the last point reached in the loading is the "crushing stress," which is the maximum stress supported by the brickwork, and at which the material is completely broken up.

That final failure takes place by sliding on planes which are inclined to the axis is shown by the fact that the pier finally breaks up into what are, roughly, two pyramids, just in the same way as is seen in the case of stone, cement, and concrete.

Effect of Mortar on Strength of Brickwork.

The five piers whose results will now be given were prepared and tested with the idea of finding out to what extent the strength of the brickwork is dependent upon the strength of the mortar. Five piers were built, one kind of brick being used throughout. These were Accrington (Huncoat plastic), with panels on both faces.

On testing three of these bricks for crushing strength it was found that they crushed at an average value of 388 tons per sq. ft. These bricks were tested whole, and were bedded in plaster-of-Paris when set on their proper bed. Cement mortar was used throughout, the proportions of sand to cement being different for each of the five piers. These proportions were respectively 1 to 1, 2 to 1, 3 to 1, 4 to 1, and 5 to 1. The mixing of the mortar and the building of the piers was carried out, as in the previous tests, by a working bricklayer. The tests were carried out as described above, the Martens mirrors being used, and each column was loaded about seven times. The first loading was taken up to 16½ tons per sq. ft., and each successive loading was about 13½ tons per sq. ft. higher, elastic readings being taken throughout. It is worth noticing that in spite of the great care taken to distribute the stress uniformly on the top faces of the piers, the observations showed there was always a greater intensity of stress on one face than on the one opposite; this

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* A paper read at Manchester before the Summer Meeting of the Institute of Sanitary Engineers on July 6th, 1906.

TABLE I.

Results of tests of five brickwork piers, 1½ft. square and 3ft. high, made of Accrington bricks and Portland cement mortar. Tested about six weeks after building.

Mortar used: Sand. / Cement.	Prop. limit last time of loading.	First crack.	Crushing.	Ratio— Strength of brick. / Strength of brickwork.	Strength of mortar.	
					At seven weeks.	At twenty weeks.
	Tons per sq. ft.				Tons per sq. ft.	
1—1	85	97	125	3·1	79	98
2—1	80	91	159	2·4	32	51
3—1	78	79	125	3·1	27	28
4—1	72	90	116	3·3	20	24
5—1	72	69	125	3·1	16	18

TABLE II.

Brick.	Mortar.	Age. Weeks.	Cracking.	Crushing.	Ratio— Brick. / Brickwork.	Mortar crushing.
Common wire-cut ...	Sand and lime	4	35	53	5—1	—
Common wire-cut	3—1 Portland cement	39	64	84	3·1—1	—
Accrington...	black lime	4	78	96	2·6—1	—
Blue Staffordshire	3—1 Portland cement	39	69	98	3·6—1	—
Brindled	black lime	12	100	165	2·9—1	31·8
Brindled	black lime	26	110	185	2·6—1	31·8
Brindled	3—1 Portland cement	12	132	169	2·9—1	10·0
Brindled	3—1 Portland cement	26	90	161	3—1	10·0
Brindled	lias lime	12	38	119	4·0—1	very poor
Brindled	lias lime	26	41	102	4·7—1	soft and crumbly

excess was found to vary from 10 to 34 per cent. The chief results are given in Table 1.

The mortar was tested in the form of cubes of 4in. side.

An inspection of these results shows the crushing strength of the mortar to diminish as the proportion of sand increases; also, the strength increased with age. These results are both what one would expect them to be. It will be noticed that only the crushing strength of the mortar is given, as it is found that in tests of this kind the cube collapses very soon after the first crack is seen.

In the case of the brickwork itself, the data obtained are, first, the proportional limit as found from the last set of readings taken in the case of each pier. These agree fairly well with the order of merit of the mortars, though there is far less difference than in the case of the mortars themselves.

In the next column are the stresses at which the first crack was detected. The author thinks this the most reliable criterion of the strength of brickwork, because it marks the point where the stress is beginning to cause internal movement of the material. The same order is maintained, though an exception is to be seen in the case of the 4 to 1 pier. This is probably due to a want of alertness on the part of the observer, whose duty it was to look out for the first crack. The "crushing stresses" in the third column do not appear to follow any particular kind of order, except that the aggregate of the first two is greater than that of the last two. This crushing or collapsing load is always found to be uncertain, and where several piers which are supposed to be precisely similar are tested there may be found to be considerable difference in the final loads, although the cracking points are near together.

It may be well here to quote some of the results of previous experiments in the testing laboratory of the Manchester School of Technology (Table II.). These piers were all 1½ft. by 1½ft. by 3ft. high. The stresses are given in the same units as in the last table.

To these may be added a few results recently selected from those published by the Royal Institute of British Architects.

TABLE III.

Strength of Brickwork, R.I.B.A. experiments.

Brick.	Mortar.	Workmanship.	Crushing strength. Tons per sq. ft.
Blue Staffordshire	Lime	Average	74
,, ,,	,,	Good	114
,, ,,	Portland Cement	Average	77½
,, ,,	Portland Cement	Good	119

In the second table it will be seen that there is a set of piers of Staffordshire blue brindled bricks, which were made in pairs, having different mortars. The second of each pair was twice as old as the first. If the cracking stress be taken as the criterion of strength, it will be seen that there is not a very great deal of difference between the strength of the lime mortar piers and the cement mortar piers, except that the cement mortar fell away in strength while the lime mortar improved with age. Whether this increase of strength would have been maintained if the second piers had been kept longer it is impossible to say.

The difference between the first four and the last two is, however, very marked. This last pier, built with lias-lime mortar, was evidently very bad. It is probable that the mortar was used too long after mixing, when it had become partially set. There was no hardening of this mortar, which could be easily crushed between the fingers, and the effect is seen in the strength of the brickwork, which is lamentably weak as compared with the first four piers of this set. This may be taken as one example of the influence of the mortar on the strength of the brickwork. The other may be taken from the results of the series given on Table I., already referred to. The five mortars used in this set have a gradually increasing ratio of sand to cement, and the results of the tests of the mortars show a corresponding decrease of strength with the increased amount of sand. The brickwork strengths also show a decrease, but not so marked. The strengths of the mortar cubes are approximately in the order: 500, 200, 160, 120, 100, while the brickwork strengths are as 140, 139, 110, —, 100.

It is quite possible that if the mortar had been tested in thin flat slabs instead of cubes the results would more nearly accord with the brickwork.

Working Loads on Brickwork.

There is not a great deal of information published regarding the safe loads that can be applied to brickwork, but from what can be ascertained, the following loads, expressed in tons on the square foot, are often used.

Brick.	Mortar.	Workmanship.	Safe stress. Tons per sq. ft.
Ordinary	Lime	Average	5
Best red	,,	Good	8
,,	Cement (2—1)	Best	10

A case is quoted of a chimney in Glasgow, where the stress is 9 tons per sq. ft. in still weather, and as much as 15 on the lee side in a gale of wind. In the light of the results quoted here it would appear that the loads usually applied to brickwork are amply safe in most cases. In forming an estimate of the probable strength of any particular kind of brickwork, it is not sufficient to be guided by the names of the materials alone, but to have an intimate knowledge of their quality and the manner in which they are used.

The experiments in the Municipal School of Technology, of which the results have been quoted, were made in connection with the teaching work of the school and the greater number of the observations were taken by the students. It would have been impossible to carry out these somewhat costly experiments if it had not been for the apparatus and material provided by the Education Committee of the Corporation of Manchester, to whom the author wishes to take this opportunity of acknowledging his indebtedness.

Engineering Standards Committee. — Mr. Edward P. Martin, president of the Institution of Mechanical Engineers, has been appointed one of the representatives of that institution upon the Main Committee of the Engineering Standards Committee in place of Mr. E. Windsor Richards, past president of the Institution of Mechanical Engineers, who has retired.

Garden Suburbs at Birmingham. — The Birmingham Corporation have adopted a scheme for the establishment of garden suburbs on the lines of those which exist in Germany. The council propose to obtain power to forbid the erection of any new buildings except in accordance with a general plan for developing all uncovered land within the city boundaries.

THE INTERNATIONAL CONGRESS OF ARCHITECTS.

The seventh International Congress of Architects is being held in London this week. On Monday morning there was an informal reception at the Grafton Galleries by Mr. John Belcher, A.R.A., president of the Royal Institute of British Architects. A meeting of the International Permanent Committee was afterwards held, when the chairmen and hon. secretaries for various sittings of the Congress were appointed.

The Official Inaugural Ceremony

took place at the Guildhall in the afternoon. H.R.H. Princess Louise and the Duke of Argyll having been received by the Executive Committee and the Ladies' Committee, the chair was taken by the Lord Mayor, who surrendered it to the chairman of the meeting, the Duke of Argyll. The presidential address of welcome to the members of the Congress was then delivered by Mr. Belcher. Sir Aston Webb proposed a vote of thanks to the Lord Mayor, who then left the hall. Mr. W. J. Locke, secretary of the Congress, then read his report, giving various data which we have already published. Following this, replies to the address of welcome were delivered by the following representatives of various countries :—

Austria	Otto Wagner
Belgium	J. J. Caluwaers
Denmark	Vilhelm Dahlerup
Holland	J. T. Cuypers
France	H. Daumet
Germany	H. Muthesius
Greece	M. A. Metaxas
Hungary	J. Berczik
Italy	Prof. D'Andrade
Japan	S. Chujo
Portugal	Ventura Terra
Russia	A Representative
Spain	Don Velasquez Bosco
Sweden	Prof. Clason
United States ...	George B. Post

The Duke of Argyll then delivered an inaugural address in which he welcomed the visit of foreign architects to this country in connection with the Congress. On the motion of Mr. Belcher a vote of thanks was accorded to Princess Louise and the Duke of Argyll, and the meeting terminated. By the courtesy of the Lord Mayor and Corporation, the Art Gallery, containing a valuable collection of works by Belgian painters was thrown open to members of the Congress, who were invited to visit it at the conclusion of the ordinary meeting.

On Monday evening a soirée was held at Burlington House, by kind invitation of the president and council of the Royal Academy.

Tuesday.

The serious work of the Congress began yesterday (Tuesday) morning, when meetings were held at the Grafton Galleries and the Institute premises in Conduit Street, W. At the former, interesting papers on steel and reinforced concrete construction were read by Prof. Henry Adams (England), Mr. E. P. Goodrich (America), Prof. Cloquet (Belgium), and Joaquin Bassegoda (Spain)—summaries of which papers will be found in the "Concrete and Steel" supplement included in this issue: while at the Institute premises a paper on "The Château of Saint-Germain" was read by M. Honoré Daumet (described and illustrated in our issue for June 14th, 1905), and papers on "The Execution of Important Government and Municipal Architectural Work by Salaried Officials," read by Herr Otto Wagner (Austria), M. Oscar Simon (Belgium), and M. Gaston Trélat (Paris). In the afternoon visits were made to Hatfield House and to Hampton Court Palace, and in the evening a conversazione was held at the Mansion House by kind invitation of the Lord Mayor.

Wednesday.

To-day (Wednesday) papers on "The Architect-Craftsman" are to be read Mr. Reginald Blomfield, Mr. W. R. Lethaby, and others at the meeting in the Grafton Galleries, while at the Institute premises "The Organisation of Public International Architectural Competitions" and "Architectural Copyright and the Ownership of Drawings" will be dealt with. There will be visits this afternoon to Buckingham Palace Gardens, Westminster Abbey, Messrs. Holloway's Works at Westminster Bridge and Messrs. Doulton's Potteries at Lambeth, and in the evening the Congress will reassemble at the Grafton Galleries and at the Institute premises, "The Planning and Laying-out of Streets and Open Spaces" being dealt with at the former, and "The Responsibilities of a Government in the Conservation of National Monuments" at the latter.

Thursday.

To-morrow (Thursday), at the Grafton Galleries, papers will be read on "The Education of the Public in Architecture," while at the Institute premises the subject of "Architectural Copyright and the Ownership of Drawings" will be further considered, and papers read on the question of the architect's control over other artists or craftsmen in the completion of a national or public building. The visits to-morrow afternoon will be to Windsor Castle, St. Paul's Cathedral, The Temple, St. Bartholomew's, The Institute of Chartered Accountants, Kensington Palace and Dorchester House, and in the evening there will be a garden party at the Royal Botanic Society's Gardens in Regent's Park.

Friday.

Friday will be given up to all-day visits to Oxford and Cambridge, and, as alternatives, to the Tower of London and Tower Bridge, and the Victoria and Albert Museum, and Royal College of Science at South Kensington, The Congress will meet, however, at the Grafton Galleries in the evening, when Mr. Cecil Smith will read a paper on "The Tomb of Agamemnon," and there will also be a gathering at the Art Workers' Guild in Clifford's Inn Hall.

Saturday.

On Saturday morning there will be a meeting of the International Permanent Committee at 9, Conduit Street, and a meeting of the Congress at the Grafton Galleries to consider the subject of "A Statutory Qualification for Architects." A morning visit to Bridgewater House is arranged, and visits in the afternoon to Greenwich Hospital, the Houses of Parliament and Westminster Cathedral. In the evening there will be a farewell banquet at the Hotel Cecil, bringing to a close the first International Congress of Architects which has ever been held in this country.

The Exhibition

in connection with the Congress is divided into eight sections. Four of them deal respectively with Early Medieval, Late Medieval, Early Renaissance, and Later Renaissance work, affording a fair chronological exhibition of British architecture. Then there is a collection of photographs of work by living architects; a water-colour section devoted to drawings of British buildings (among them being two drawings by Turner, and a number of others by well-known draughtsmen); a furniture section (in charge of Mr. E. Guy Dawber), comprising some very beautiful picked specimens of British furniture from the year 1535 downwards; and a silver collection—only a small one, in three cases, but valued at many thousands of pounds.

The following are some

Notes on Buildings Visited.

The Guildhall.—The old roof of the Great Hall was destroyed in the Fire of London (1666). A temporary flat roof was erected in its place and remained in position for nearly 200 years, when the present roof was erected from the designs of the City architect, Sir Horace Jones, in 1864. The fire did much damage to the inside walls of the Great Hall and they were covered many years ago with a preparation of silica; this coating it is now proposed to remove.

Burlington House.—The old house—the centre block in the rear of the Quadrangle, was built in 1665 for the first Earl of Burlington, Colin Campbell, being the architect. The room on the first floor remains as it was decorated by Lord Burlington in 1720 and is a very interesting example of the period.

Hatfield House.—The present mansion was built between 1607 and 1611. The facade is supposed to have been designed by John Thorpe. At one time the mansion was allowed to fall into a state of disrepair, and in 1835 the west wing was demolished by fire; in the rebuilding, however, the original plan was mainly adhered to. The plaster ceiling of the gallery (163ft. by 20ft.) and the chimney-piece of the Great Chamber are notable features, as also the Flemish stained-glass work in the chapel.

Hampton Court Palace.—Built originally by Cardinal Wolsey, who presented it to Henry VIII. in 1526, it was partly pulled down by William III., who erected the celebrated Fountain Court, the Colonnade and the State Apartments—Wren being the architect. Verrio executed many paintings inside the building, and Grinling Gibbons carved the east facade. A fine example of an open hammer-beam roof is to be seen in the Great Hall (106ft. by 40ft. by 60ft. high).

Buckingham Palace. — Built 1752-1835 from designs by John Nash, and afterwards altered by Edward Blore, who was responsible for the present front. The grounds comprise 43 acres.

Westminster Abbey.—As the result of a thorough examination of Westminster Abbey by the architects to the Dean and Chapter and of the Ecclesiastical Commissioners, it has been decided during the next four or five years to execute extensive repairs, at a total cost of £20,000. The scheme includes the practical refacing of the whole north front, the surface stones being largely replaced by new ones.

Windsor Castle.—In St. George's Chapel is to be seen one of the finest examples of fan vaulting in the kingdom. Prof. Willis examined its construction in 1840, during the repair of the external roof, and made careful drawings of it, preserved in the R.I.B.A. "Transactions" for 1842.

St. Paul's Cathedral.—Begun and completed under Wren (1632-1723) at a cost of £747,661. The outer dome, 145ft. in diameter, is of wood covered with lead and does not support the lantern, which rests on a cone of brickwork raised between the inner cupola and the outer dome.

The Temple.—The Middle Temple Hall was built in 1572, and is an admirable example of Elizabethan work. The Temple Church consists of two parts—the round church (Transition Norman work) and the choir, finished in 1240; alterations and restorations were carried out in 1839-42 at a cost of £70,000. The Middle Temple Library, opened in 1861, was designed by H. R. Abraham, and the Inner Temple Hall, 1868-70, by Sidney Smirke.

St. Bartholomew's.—The finest example of Norman work left in London. In recent years considerable restoration has been carried out under the direction of Sir Aston Webb.

Institute of Chartered Accountants. — Built 1890-1893 from designs by Mr. Belcher, and one of his most successful works. Notable, too, as showing the employment of sculpture with architecture, there being a friese 140ft. long by Mr. Thornycroft, and corbel groups, &c., by the late Harry Bates, A.R.A.

Kensington Palace. — Sold for 180,000 guineas to William III., and by him partly rebuilt according to the designs of Wren and Hawksmoor. The Orangery is generally ascribed to Wren.

Dorchester House.—Erected in 1852-1854 from designs by Vulliamy. There is a very elaborate marble staircase in the interior, many gorgeous rooms, and a mantelpiece by Alfred Stevens.

Tower of London.—The oldest part is the White Tower, built by William the Conqueror and restored by Wren, who modernised the exterior, though the interior remains intact. The chapel is a fine example of Norman work. The tower is now undergoing its triennial cleaning and painting. The doors of some of the old towers show a new coat of green. The ancient woodwork of the Traitor's Gate and Bloody Tower is to be cleaned and perhaps varnished, and the buildings occupied by the Lieutenant of the Tower painted stone colour.

Oxford.—Of all the colleges there is not one to compare with Magdalen for pure charm. All its buildings date from about 1480, the tower about 1500, the large block in the deer park about 1735, and the front to High Street by Mr. Bodley. Of modern work, there is Exeter College Chapel (by Scott, 1856), Balliol College Chapel (1856), and Keble College (1870), by Butterfield, while Mr. T. G. Jackson, Mr. Henry T. Hare, Mr. E. P. Warren, Mr. Basil Champneys, and Mr. Reginald Blomfield have done considerable work there. Burne-Jones did some windows at Manchester College and a fine tapestry at Exeter College.

Cambridge.—Clare is one of the most finished pieces of architecture in the University, and King's College Chapel the most impressive interior. Of modern work, a great deal has been done by the late Mr. Alfred Waterhouse, Sir Gilbert Scott, Mr. G. Gilbert Scott, jun. (whose new court at Pembroke is very fine), Sir Aston Webb (Gonville and Caius), Mr. Bodley (Queen's), and the late Mr. Pearson (Emmanuel and Sidney Sussex). The large Roman Catholic Church of Our Lady and the English Martyrs (1890) is by Messrs. Dunn and Hansom.

South Kensington Museums.—The large extension to the Victoria and Albert Museum now in course of erection is by Sir Aston Webb. The Museum of Natural History is one of the late Mr. Waterhouse's best works, notable as an early example of the use of terra-cotta on a large scale. The design was the outcome of a competition held in 1864, which was won by Captain Fowke, of the Royal Engineers—the designer of the Albert Hall. Captain Fowke, however, did not live to undertake the work, which was given to Waterhouse. The contract for the building, exclusive of the towers, was £352,000.

Greenwich Hospital.—One of the most interesting buildings in London by reason of its position and monumental treatment. As successor to Inigo Jones, Wren was the architect for most of the work; but Hawksmoor, Campbell, and Vanbrugh had a share in it. The ceiling in the Painted Hall is by Thornhill (1717).

Houses of Parliament.—A competition was held for the design, and Sir Charles Barry's scheme was accepted. It was a condition that the "Gothic or Elizabethan" styles should be employed. It was originally intended to remove St. Margaret's Church and to enclose the whole of New Palace Yard with buildings. The magnificent Victoria Tower is 70ft. square and 400ft. high to the crown on the flagstaff, the Clock Tower being 316ft. high. The roofs are of wrought-iron covered with cast-iron galvanised plates. Altogether the Houses of Parliament cost £2,000,000, one quarter of that sum having been spent on the sculpture, decoration, and elaborate fittings.

Westminster Cathedral.—Bentley's great work; the most important Roman Catholic church built in this country since the Reformation. The scheme is that of one huge nave 60ft. wide, 117ft. high, and covered with saucer domes of concrete. It is practically only a great shell of brickwork at present, the interior decoration being but little advanced. Some splendid marble and mosaic work is, however, to be seen there.

Bridgewater House.—Built in 1847-50 from Sir Charles Barry's designs.

Obituary.

Mr. W. J. Gant, F.R.I.B.A., of Hastings, died recently, aged 82.

Mr. John Dixon, master-builder, of Kendal aged 59, committed suicide by hanging himself last week.

The late Mr. Edward Solomons, F.R.I.B.A. of Manchester, who died in May last, left estate which has been proved at £4,243 gross.

Mr. Bradley Batsford, for many years senior partner in the well-known firm of architectural publishers on High Holborn, died recently, aged 60. It is only quite recently that his father died, the founder of the firm. Mr. Bradley Batsford was a man of keen perception, artistic taste, and sound judgment, and his loss is felt greatly. The business is being carried on by his brother and his nephew.

OFFICIAL ARCHITECTURE.*

By Otto Wagner.

Imperial and Royal Superintendent of Works; Profess
of the Imperial and Royal Academy of Plastic Arts.

[*On behalf of the Society of Austrian Architects*]

It will be convenient to give first a clear definition of the word "architect" and also some explanation of the process of development of the architect, because all the differences of opinion are more or less rooted in the wrongful acceptation of these conceptions.

With regard to the way in which the architect is developed, it must be taken into consideration that artistic capacities, such as manual proficiency, imagination, taste, individuality, and a certain gift for invention, are faculties which the architect must possess in his quality as an artist, but which cannot be learnt. On the other hand, there are a general culture and a technical and constructive knowledge which the architect must also possess, but which can be acquired by study.

The amount of scientific knowledge to be acquired by the architect has reached such vast proportions that it has to be divided into parts, consequently into branches of knowledge. For this reason alone it is not possible for the young man who wants to become an architect to acquire full knowledge of all these special branches, since the time at his disposal, and the intellectual receptivity of the individual, are limited.

The architect, during the whole of his professional activity, will cultivate first of all the region of art, which nowadays even in literature has become of a very wide range. But as at the same time he is expected to have full knowledge of all technical innovations, his technical and scientific education should extend so far that he will be able to understand the essence of the sciences and their progress, and that this understanding will enable him in his practical work to put the results of human progress at the service of art.

His technical education must, moreover, enable him to choose the proper methods of construction and the most convenient materials to be employed. Nay more, his knowledge, aided by his inborn inventiveness, must enable him to combine new forms of construction, or to vary existing ones, so that they shall answer fully the purposes for which they are required. From this it follows that the practical work and experience which the architect gains in the course of his career must be based upon a sufficiently wide knowledge.

There is, therefore, a sharply marked limit in the course of education of the architect. This limit, as already said, lies naturally between the acquired complete technical education and the entering into an academy of plastic art.

It is the duty of the academy, or rather of the professors of teaching in such an institution, to examine and to decide whether or not the student possesses the inborn faculties enumerated above.

It cannot be too strongly recommended to such professors to use the utmost severity in this examination, because the result of it will have a great influence upon the general artistic standard of the profession, and because it is only by this method that class of pseudo-architects who in our days intrude on the profession, to the discredit of art as well as artists, can be made to disappear from the scene.

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* Summary of a paper read at the Seventh International Congress of Architects.

We wish particularly to point out that for architects there can be only one school —viz. an academy of the plastic art; an academy for this reason, that art cannot be taught, and consequently cannot be admitted as a scientific subject in any course of studies, and because artistic education only consists in this, that the master shows to the art pupil the right way to perfection, and encourages him by his own activity to enter on this path.

It is, therefore, absolutely wrong for technical high schools and schools for artistic trades to admit in their plan of studies the tuition of architecture, because, owing to the students not being tested as to their aptitude for the profession, an absolutely inferior standard of architecture is created.

From what has been said so far it follows that the architect is an artist with a scientific education.

By the studies of technical matters successfully gone through by the pupil, and with the academical apprenticeship, the requirements of the architect are not yet, however, exhausted. The student is still lacking practical activity, and the experience which results from it.

If the apprenticeship of the architect is an exceedingly long one, it will certainly be very considerably extended by the period he is acquiring practical knowledge in an architect's office.

In this section of the apprenticeship of an architect (his apprenticeship really ends only with his death) he stands once more at the parting of the ways in the progress of his education: that is to say, in which way do his capacities lie? Circumstances, &c., lead him to the point either to accept the struggle for existence, or to enter into the safe haven of a salaried position. Here his artistic capacity plays the main part, because the greater it is the more easily will he be able to refuse the enticing bonds of a fixed position, unless it be a professorship.

The curriculum of education of the architect so far sketched is the normal one, but we would remark at once at this stage that it is certainly not the only one, and that there will be sufficiently numerous cases in which the inborn capacities of the architect, in other words his talents, are so great that a lack of scientific education is hardly of any importance.

This fact, as well as that other, that there is no limit of talent either in more or in less—further, the fact, which it is impossible to dispute, that the first architects in the world in a great many cases are not agreed on the question as to what constitutes an architect, give the certain proof that the title of architect cannot be protected by letters patent, and that a judgment of artistic qualities is possible only by the artists themselves, consequently by the grouping of the artists among themselves.

In the latter circumstance we find also the proof that municipal and State administrations are not even in a position to make the proper choice of an artist to fill an office.

Still another important factor comes into consideration for making such a choice. The architect appointed to an office will, while occupying it, certainly not play the leading part. His individuality, his taste, &c., must therefore subordinate themselves to the same qualities in his superior, or even of more than one superior. The works carried out under the supervision of the office would therefore not show the capacities, the taste, and individuality of the creating artist, but certainly the less valuable ones of his superiors, and as such superiors in most cases are laymen in questions of art, and often even in technical matters, it will be hardly necessary to give any more reasons why from such a combination no good can come.

It must also be mentioned that the artistic gifts of an artist oppressed by the yoke of office can never undergo the absolutely necessary development. These considerations prove sufficiently that a municipal or a State administration is never in a position to obtain the services of first-class artists as salaried officials.

But municipal and State administrations have certainly the sacred duty of cultivating the fine arts, which means with regard to architecture that the buildings erected by them should exercise the effect of models. But buildings of such a description can only be expected from great artists, and not from officials of an inferior artistic capacity.

For the same reasons the competence of the officials must only extend to the practical, technical, and economical, but never to the artistic control of buildings in the course of construction. If, finally, it is taken into consideration that, by the awakening which took place in the region of art, a lively controversy raged everywhere, and that even to this day public opinion has hardly returned to calmness, and therefore is not in a position to judge with unbiassed artistic feeling works of art, such a large number of reasons has been put forward that the correct answer to Question I. becomes easy; it can only be this:

Important municipal and Government buildings can only be constructed by eminent artists, and not by salaried officials.

The considerations alleged up to now will facilitate considerably other questions before the Congress.

By Oscar Simon.

(On behalf of the Central Society of Architecture of Belgium.)

The Central Society of Architecture of Belgium is of opinion that no advantage can result from the execution of public buildings by salaried officials (surveyors, &c.).

Neither for the administration, which protects its agent and takes upon itself the civil responsibility;

Nor for the public, which pays and suffers from the imperfect arrangements of the buildings destined for its use, and the æsthetic feelings of which are too frequently hurt and painfully impressed by the permanent sight of buildings generally devoid of artistic character.

While we shall avoid entering upon personalities or trying to prejudice private interests, and having only in view the preponderance of the architectural art, and for our only aim a better future standing of architects as a professional body, considering that these have a domain of art and its interests to defend, we hold that it is an abuse that certain officials (surveyors) should offer to private parties on the look-out for authorisation by administrations services which are prohibited by the regulations and which are a form of unlawful competition highly prejudicial to the independent architects existing only on the income from their professional art.

It is desirable that more energetic action should be taken by architects, with a view to obtain legislative powers:

1. By bringing into harmony with the modern requirements of life the rate of the out-of-date tariffs still enforced upon architects.

(A juridical consecration should be given to this principle: "To a superior talent higher fees should be allowed.")

2. By putting a stop to persons invading the architectural domain who do not exclusively exercise the profession of an architect.

3. By the revision of the laws on building in those passages where the text, *or the interpretation given to it*, imposes on the architect obligations and responsibilities inconsistent with his mission as an artist and out of proportion to the fees which are allowed for them.

(Apply juridically to the architect and to the contractor the common law principle: "To a larger profit must correspond a more extended responsibility.")

4. The Central Society of Architecture of Belgium, in the conviction that even within a modest range the co-operation of the architect will still result in the work being carried out under advantageous conditions as to price, duration, and arrangement, without excluding an artistic character which it is always necessary to strive after, is of opinion that if it be essential that the execution of public buildings should be entrusted to private architects it is ardently to be desired that *all the work, whatever its importance may be*, of construction and arrangement of plan of buildings for the public use should be exclusively given to practitioners of the architectural art.

In this there are considerations of corporative, economic, educational, and artistic interest, towards which the public officials must not remain indifferent.

To our corporation are due the normal consecration of public teaching of art, a professional encouragement, and an official recognition of the rights and prerogatives legitimately given to our profession.

Moved by a feeling of professional solidarity, *the Seventh International Congress of Architects meeting in London in* 1906, wishing to affirm with all its power the claims and just aspirations of the architects with a view to an improvement of the economic conditions of their existence, formulates the resolution:

That in the future the administration of States, departments or provinces, municipalities or communes, as well as the administrations of benevolent institutions which may be founded by the former, shall give instructions for professional architects to be appointed by way of public or limited competitions, or whose special capacities or repute shall be universally recognised, for the projects of works or buildings to be carried out within their jurisdiction;

That an absolute prohibition shall put an end to the interference of agents paid by the public administrations, that they shall obtain through private persons an authorisation which can only be granted by public authorities;

That within the limits of their influence in the legislative assemblies our representatives shall take the initiative to bring about the reform of the laws in force in such cases where the obligations and responsibilities imposed on the architect are incompatible with his mission as an artist and in disproportion to the emoluments attached thereto.

Views and Reviews.

Prof. Adams's Building Construction.

Professor Henry Adams is an authority on the subject of building construction, having devoted a good many years' attention to the subject. He is noted for the clear manner in which he deals with problems which, in the hands of others, become difficult of comprehension by the ordinary student. We are glad that he has now collected together into one volume a good deal of the information that he has published from time to time. The book is, as stated in the preface, supplementary to the other older books on building construction. In this fact its great value lies. The older books are defective in many respects, especially as regards modern practice, but Professor Adams's book not only serves to provide information which they do not give, but is also a guide to their ready and clear interpretation. One great merit of the book is that many of the examples used by Professor Adams to demonstrate points of theory are taken from actual practice, and thus they are related to everyday problems that occur within the experience of most students. The book is a cheap one, and ought to be in the hands of everyone connected with the building trades. There is certainly a want of continuity about the volume from the very fact that it is supplementary to standard works, but this does not detract from the usefulness of the book. The latter part of the work dealing with stresses in structures is excellent, and we only regret it was not extended. The notes and examples of architecture we think ought to have been omitted. They are not intimately related to the rest of the matter on building construction, and they are too disjointed to be of much service. Although Professor Adams has performed his part of the work well, we cannot say that the publishers have done the same. The illustrations are often reproduced too small and not placed in direct conjunction with the text, so that it is irritating to refer to them when reading the text. The plates are distributed throughout the volume without any relation to the text.

"Building Construction," by Prof. Henry Adams, M. Inst. C. E., &c. London: Cassell & Co., Ltd., price 7/6 nett.

Joiners' Machinery.

The large part which machinery plays in modern joinery means that this book will appeal to a large section of readers. There are not many books that deal with the elements of joinery manufacture as simply as this, and therefore, the book is very welcome. It is fortunately well and clearly written and printed in good type.

"Joiners' Machines and How to Work Them," by T. R. Groom. London: William Rider & Son, Ltd., price 1/- nett.

Plastering.

This is another addition to the many little hand-books of building crafts which Messrs. Cassell publish, and conforms to their general character. It is only a very elementary book, but so far it is quite serviceable. Plasterers' tools, methods of executing ordinary plastering, the theory of the subject, practical hints, together with estimating and measuring are all dealt with, while a good deal of ordinary memoranda is also collected together.

"Plasterers' Work." Edited by P. N. Hasluck. London: Cassell & Co., Ltd., price 6d. nett.

Illustrations of Architecture.

The various plates from Fletcher's History of Architecture have been re-published by Mr. B. T. Batsford separately to serve as class illustrations for the study of architectural history. These will undoubtedly be useful for distribution amongst students attending classes or special courses of lectures. They have been divided up into four sections, namely: Classic and Early Christian, Medieval, Renaissance and Modern, and Non-Historical. The last term we objected to at the time of the publication of the book. It is quite inaccurate to call Indian, Chinese, Japanese and Saracenic work non-historical. The author, it is true, does not deal with the matter historically, as it should be dealt with, and appears to be generally at sea in this branch of art. The fourth section, indeed, is least useful of all. We may mention that the diagrams have also been reproduced to a larger scale, so as to serve as lecture diagrams, measuring 40 inches by 27 inches, *i.e.*, printed on double elephant drawing paper, suitable for affixing to the wall. There are 168 of these sheets in all and a complete set costs £60 nett. The lecture diagrams are also sold in a series of not fewer than 10 at 8/- nett- each.

"Class Illustrations for the Study of Architectural History," from "A History of Architecture on the Comparative Method," by Professor Banister Fletcher, F.R.I.B.A. and Banister F. Fletcher, F.R.I.B.A. London: B. T. Batsford, price, 13s. 6d. nett.

Modern Buildings.

We have already reviewed the first volume of this work in our issue for March 7th last. The second is divided into three parts:—(1) town houses, shops and offices; (2) specification writing and quantity surveying; and (3) the constructional finishing of a building. In the first part a number of valuable plans of somewhat noted buildings that have been recently erected in London are included. There are also coloured plates, showing the manner in which working drawings are customarily prepared. The second part contains a specification for a draper's shop that is interesting, but of course if this is all that is to be provided in the way of specification writing it is altogether insufficient. Several chapters have been contributed by Mr. W. H. Brown, F.S.I., on "Quantities" that are distinctly valuable, summarising such an important subject into a short space. The third part contains chapters on joinery, woods, tools and methods of working skirtings, dados and panellings, doors and framings, window framings, cupboards and bath and w.c. enclosures, stairs and stair building (all by Mr. H. Kennard); external plumbing, drainage, sanitary fittings and their plumbing, and glazing (all by Mr. T. H. Bishop, A.R.I.B.A.); an anonymous chapter on floor paving and wall linings; and, finally, chapters on bells and bell-hanging and plastering, by Mr. H. Y. Margary. There is much useful information in this book, and we look forward to the succeeding volumes in anticipation that the complete work will be a most valuable one.

"Modern Buildings: Their Planning, Construction and Equipment," Vol. 2 edited by G. A. T. Middleton, A.R.I.B.A. London: The Caxton Publishing Co., price 10s. 6d. nett per volume.

Terra-Cotta and Reinforced Concrete Floors.—The National Fireproof Co. have secured the contract for the terra-cotta and concrete floors at the Manchester Infirmary, of which Mr. Edwin T. Hall is the architect.

Notes on Competitions

Holborn Municipal Offices.

We publish in this issue the selected design for the new municipal offices to be erected for the Borough of Holborn. It will be recollected that a competition amongst seven selected architects in the locality was instituted a short time ago. From these designs the committee in charge of the matter selected design No. 1, placing design No. 5 second, and design No. 6 third. At last Wednesday's meeting of the Borough Council the envelopes were opened, and the authors of design No. 1 were announced to be Messrs. Warwick & Hall, of South Square, Gray's Inn, W.C. The site for the new buildings adjoins the existing library on High Holborn, and it will be seen that Messrs. Warwick & Hall have taken this into account by making their new design an addition to the library building, repeating it as a wing, with a new centre portion between. The plans sufficiently show the internal arrangements. The other competitors all produced a fresh design, and though we may not perhaps consider the architecture of the library to be particularly worthy of emulation, still, in the circumstances, we think Messrs. Warwick & Hall have done wisely to incorporate it with their scheme, as it enables a more coherent building to be produced, and, at the same time, interferes in the least possible way with the existing arrangements. The estimated cost of the new building is £19,205.

New Central Library, St. Pancras.

The award of the assessor (Mr. Belcher) will be announced at the meeting of the St. Pancras Borough Council to be held on Tuesday, July 31st, when the envelopes will be opened.

Llanidloes Public Hall.

In open competition, the design of Messrs. Shayler & Rigg, architects, of Oswestry and Shrewsbury, has been selected for this building, which is to comprise a market hall, temperance hotel, reading-room and library, and rooms for town council meetings, &c.

Wesleyan Church, Ossett.

The designs of Messrs. Garside and Pennington, architects, of Pontefract and Castleford, have been selected in the competition for a new Wesleyan church and classrooms at South Parade, Ossett.

Competitions Open.

The following is a list of competitions open:—

DATE OF DELIVERY		COMPETITION.
July	24	EXTENSIONS TO SALFORD ROYAL HOSPITAL. Limited to architects in Manchester and Salford. Premiums £100. Names by this date to G. Ruddle, secretary and superintendent of the hospital.
July	28	BATHS AT PRIMROSE MEADOWS, SHEFFIELD. Limited to Sheffield architects. Premiums of £30, £20, and £10. Particulars from Town Clerk.
Sept.	28	SEWAGE DISPOSAL SCHEME FOR ELLESMERE. Premium of £20. Particulars from R. E. Lloyd, Clerk to Urban District Council, Ellesmere.
Sept.	29	REBUILDING OF HENSHAW'S BLIND ASYLUM AT MANCHESTER. Limited to Manchester architects. Premiums £100, £50, and £25. Assessor, Mr. John Holden, F.R.I.B.A.
Oct.	1	ALPHABET COMPETITION. Prizes of £20, £10 and £5. For particulars see "Architectural Review."

Notes and News

L.C.C. Central School of Arts and Crafts.—The tenth annual exhibition of students' work was on view at 316, Regent Street, W., on Thursday, Friday, and Saturday last. More than 900 students have been enrolled during the session, being a great advance upon previous records. The new school building in Kingsway is now under construction.

University College School, Hampstead.—The foundation-stone of the new buildings of University College School at Frognal, Hampstead, will be laid on Wednesday next by the Mayor of Hampstead, Sir George Barham. The architect of the school is Mr. Arnold Mitchell, F.R.I.B.A., whose design was selected in competition last year.

Ipswich Building Trade Dispute Settled.—Six months ago the Ipswich Master Builders' Association gave notice of a reduction of a penny per hour. The men's reply to this was a request for an increase of a penny per hour. No further action, however, was taken on either side, and the matter has now been settled by the builders agreeing to withdraw the notice for reduction and maintaining the present rate of wages.

A Large Stained-Glass Window.—Referring to the paragraph about a large stained-glass window in the North which appeared in our columns recently, Messrs. Joseph Chater & Sons, of 2 St. Dunstan's Hill, London, E.C., write stating that they executed for the Church of St. Lawrence Jewry, in Guildhall Yard, a window 14ft. by 7ft.—all in one light—with 98ft. super. in it. "This, we think, should be a record for the South."

Fifth Avenue, New York, is proposed to be widened. It is the contention of the city authorities that many of the buildings, particularly some of the new, elaborate business structures, extend beyond the legal building line and must be taken down. If this contention is successfully maintained in the courts, it will mean the expenditure of thousands of dollars by property owners and a gain of a wide thoroughfare to the city.

Elementary Schools at Exeter.—Tenders are to be invited for building new elementary schools for girls and infants in the parish of St. James, Exeter. The question of what is a fair charge per head in relation to the accommodation provided was debated at the last meeting of the council. The architect put the cost at £11 per head for the buildings, exclusive of equipment. Several members, however, considered this an excessive sum. To build for 540 children on the architect's estimate will cost rather more than £6,000.

Wallpaper Manufacturers: Halifax Works to be Closed.—The directors of Wallpaper Manufacturers, Ltd., have decided to close forthwith the works at Halifax just acquired from Page, Arnold, & Co. These works, which, with the exception of a small concern at Louth, comprised the only factory outside the wallpaper combine, were only taken over by Page, Arnold, & Co. two years ago after having been standing idle for several years. Entirely new machinery was installed, and improvements carried out, at a cost of over £40,000, while workmen were imported from Glasgow, London, Darlington, and elsewhere.

The New Court House and Technical School at Cheshunt was opened recently. It has been erected by Mr. Paul from designs by the county surveyor.

A New Liberal Club has been erected at Honley, Huddersfield, at a cost of £1,700. The architect was Mr. Joseph Berry, of 3, Market Place, Huddersfield.

The W. H. Smith Memorial Hall and Club has just been completed off Kingsway at a cost (including site) of £12,000. Mr. Allen Vigers was the hon. architect.

The Vauxhall Bridge Pylons.—£440 is proposed to be spent on erecting full-size models of the pylons at the west approach, to the new bridge across the Thames at Vauxhall.

New Baths for Blackburn, in Belper Street were opened last week. They have cost £9,000, and were designed and carried out under the direction of the borough engineer, Mr. W. Stubbs.

West Islington Branch Library.—This library is now being erected. The site is in Thornhill Square. Messrs. Dearing & Son, of Islington, are the builders, and Prof. Beresford Pite, F.R.I.B.A., is the architect.

All Saints' Church, Tooting Graveney, was dedicated recently. It is 180ft. long and has an imposing square tower nearly 100ft. high. The cost of the building has been £50,000. Mr. Temple Moore was the architect.

Messrs. Patman & Fotheringham Ltd., of 100 and 102, Theobald's Road, W.C., have been appointed builders for the rebuilding of the Avenue Theatre for Mr. Cyril Maude, after the Charing Cross roof accident last December.

New Schools at Byfield are in course of erection from designs by Messrs. Law and Harris, F.R.I.B.A., of Northampton. The contractor is Mr. T. Higgs, of Northampton. The total cost, exclusive of site, will be £2,280.

A New Chapel has been erected at Lower Bullingham, near Hereford, for the use of the Community of the Sisters of St. Vincent de Paul. It has cost £5,000, Mr. Ware, of Exeter, being the architect, and Messrs. William Bowers & Co., of Hereford, the builders.

New Y.M.C.A. Buildings at Ealing are being erected at a cost of £6,000 from designs by Mr. W. A. Pite, F.R.I.B.A. The building will consist of four floors, comprising reception hall, assembly hall, reading-rooms, games' room, library, classrooms, and gymnasium.

A New Roman Catholic Church at Tyne Dock has just been completed. It provides accommodation for 500 adults. The church has been designed by Messrs. Brodrick, Lowther & Walker, architects, of Hull. The contractor for the work was Mr. James Young of Tyne Dock.

The New Undercliff Promenade at Ramsgate, the construction of which has been carried out at a cost of £4,600, was opened on Wednesday last by the mayor. The work was undertaken during the winter, and formed part of a scheme for giving assistance to the unemployed.

"Bruce House," the "poor man's hotel," which the London County Council have built at a cost of £46,000 in Kemble Street, Drury Lane, was opened on Friday last. It contains 699 cubicles (let at 7d. per night), and dining-room accommodation is provided for 400 men, with cooking ranges &c., for the men's use, as in Rowton houses

The Historic Farm of Mount St. Jean at Waterloo, is not to be pulled down.

The Theatre Royal, Runcorn, was destroyed by fire last week. It was built mostly of wood.

Brixton's New Fire Station, at the corner of the Gresham Road and Station Road, was opened for duty on Thursday last.

The Edinburgh Architectural Association held its annual excursion recently, when the members visited Tulliallan & Culross.

Sea Defence Works at Lowestoft, comprising a wall and groynes, have been carried out by the corporation at a cost of £68,000.

Law Cases.

An Architect's Registered Design.—In the Court of Appeal last week the case of *Staple v. Warwick* was heard. This was an appeal by the defendant from an order made by Mr. Justice Phillimore in chambers committing him to Holloway for contempt of an order granting an interim injunction pending the hearing of the action. Council said defendant was an engineer, who had commenced to erect an iron tower at Cleethorpes, Lincs., which the plaintiff, a well-known architect, alleged was an infringement of a design which he had registered. The plaintiff conceived the idea of an iron tower which could be ascended by means of an encircling road and staircase. He registered a design under the name of "The Helter-skelter Lighthouse." Several of these lighthouses had been erected from his design, one at the Earl's Court Exhibition, another at Blackpool, and so on, and they had been well patronised. The defendant began erecting one at Cleethorpes which he believed was not an infringement of the plaintiff's registered design. The plaintiff, however, commenced an action, and moved for an interim injunction before Mr. Justice Bucknill, and the learned judge made the order as asked. The defendant therepon altered his design and went on building. The plantiff then applied to Mr. Justice Phillimore to order the committal to Holloway of the defendant, alleging that the building he was putting up was a breach of the order made by Mr. Justice Bucknill. Mr. Justice Phillimore took that view, and the defendant now appealed against the attachment order which had been granted. The Master of the Rolls said that the defendant's case was that he had only copied that part of the plaintiff's design which admittedly was not protected, because it was not novel, and had not infringed those parts of it which could be validly registered. The plaintiff's design was in the form of a lighthouse, and when the action was commenced the defendant at once changed his design from a lighthouse to a machicolated building with overhanging battlements. With the question of infringement still undecided he was not going to allow this gentlemen to go to prison for an act which it might turn out after the trial was not a breach of the injunction, and therefore not an act of contempt at all. With due deference to the learned judge, he thought the committal order should not have been made. The appeal would accordingly be allowed, and the order set aside. Lord Justice Cozens-Hardy concurred.

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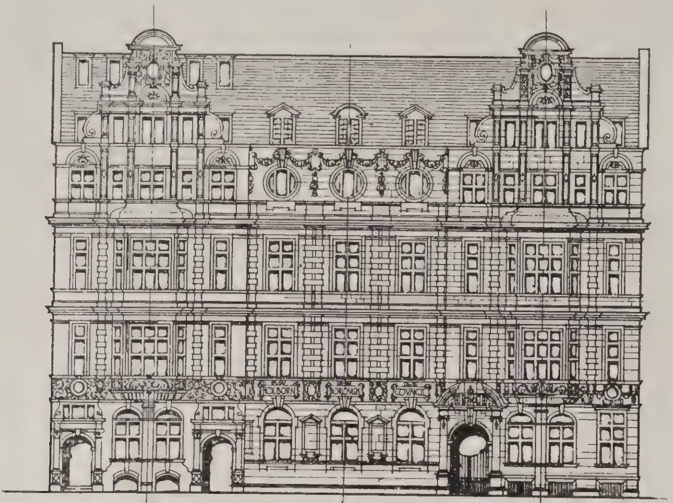
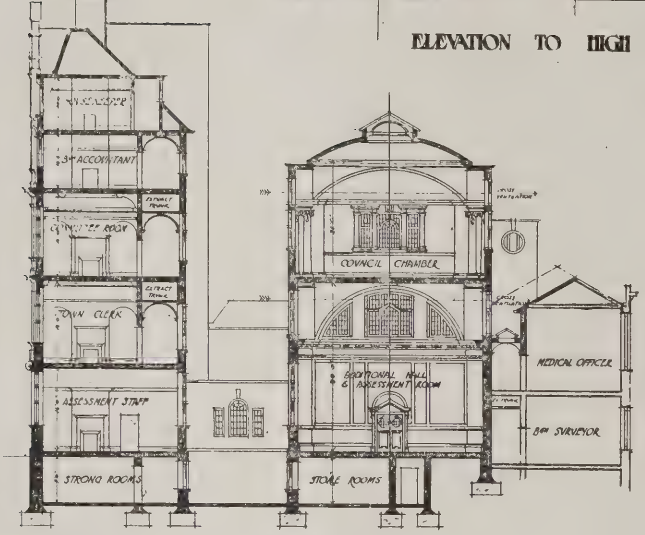
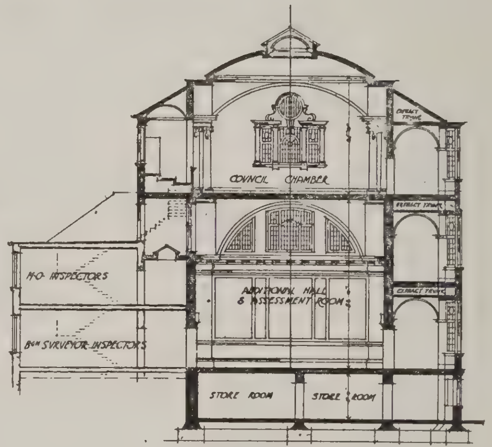
Supplement to
The Builders' Journal and Architectural Engineer,
Wednesday, July 18th, 1906.



ELEVATION TO HIGH HOLBORN

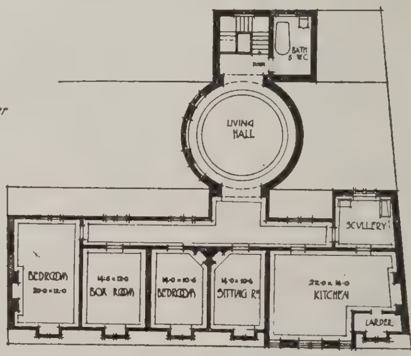


SECTION A A

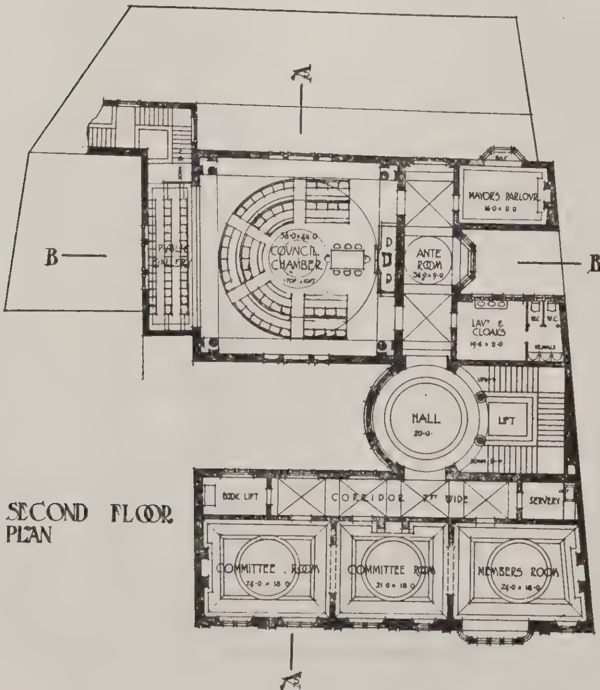


SECTION B B

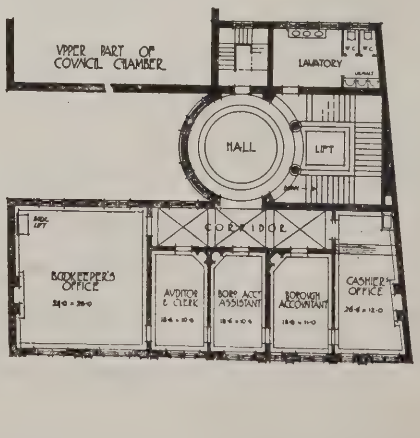
HOLBORN MUNICIPAL BUILDINGS



ATTIC PLAN



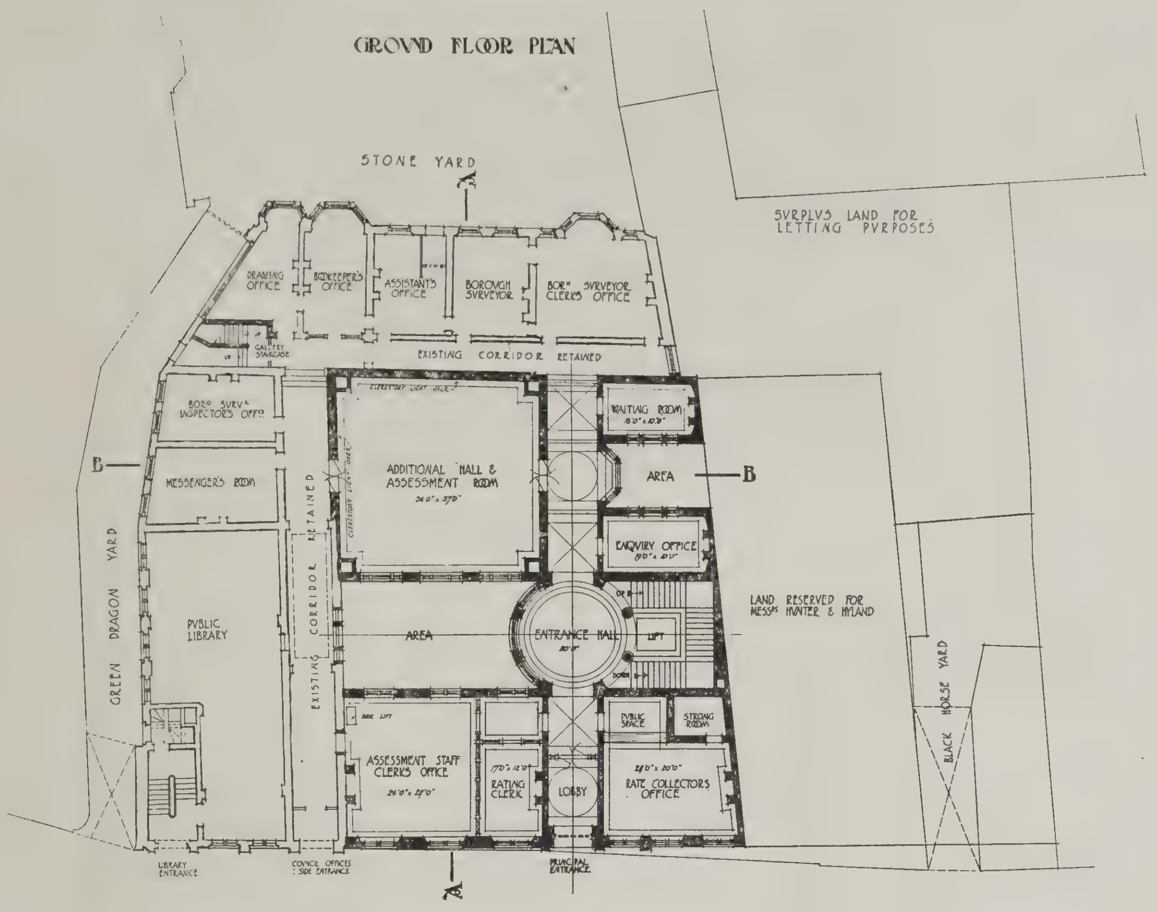
SECOND FLOOR PLAN



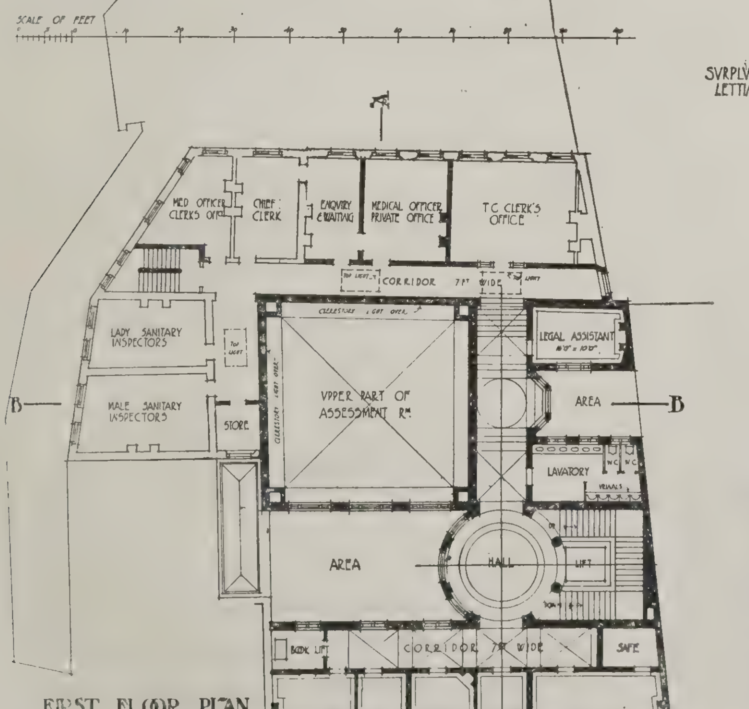
THIRD FLOOR PLAN

SELECTED DESIGN. WAR

GROUND FLOOR PLAN

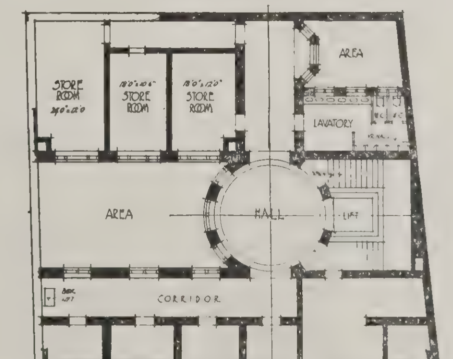


HOLBORN MUNICIPAL BUILDINGS



FIRST FLOOR PLAN

BASEMENT PLAN



ND HALL, ARCHITECTS.

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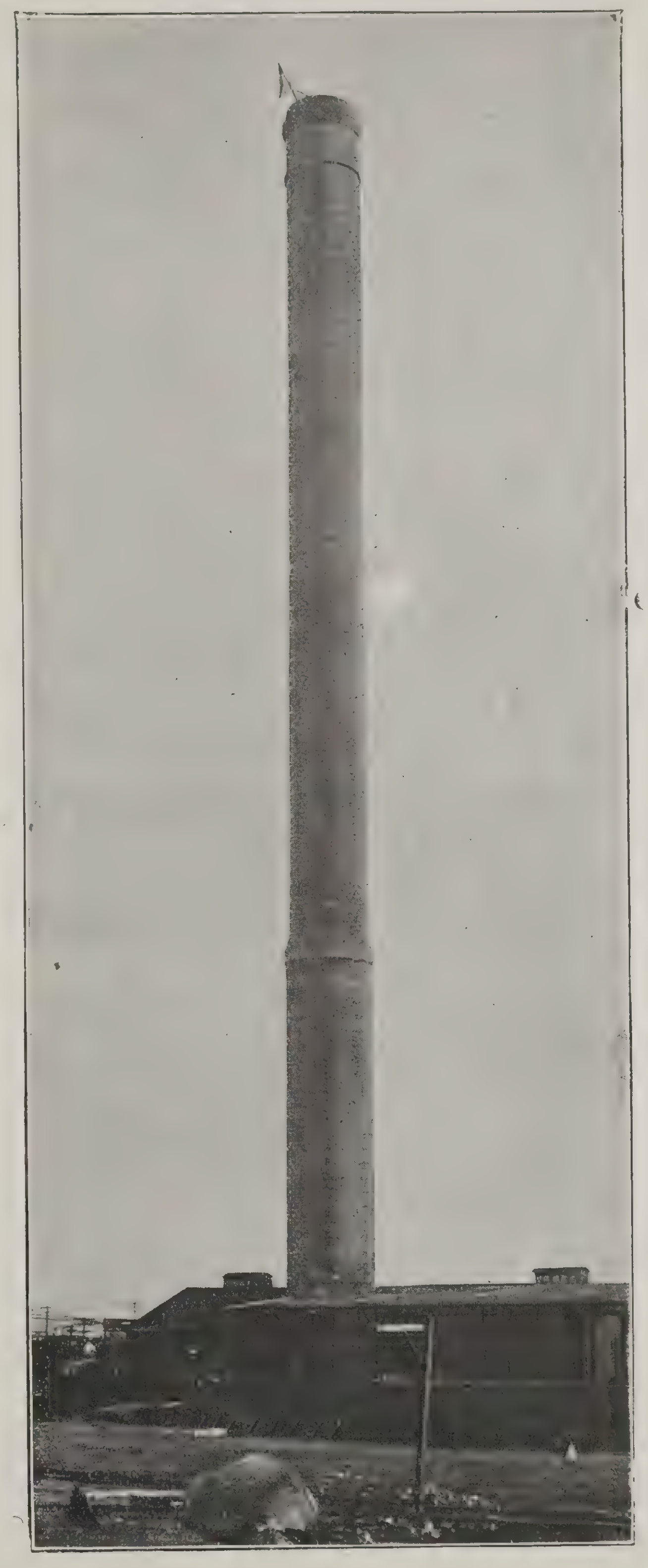
HIGHEST AND LARGEST REINFORCED CONCRETE CHIMNEY IN THE WORLD, COLUSA PARROTT MINING & SMELTING COMPANY, BUTTE, MONTANA, U.S.A.

Two large Reinforced Concrete Chimneys on this system are being erected within twenty miles of Charing Cross



HEIGHT 352 ft. ABOVE GROUND.

DIAMETER 18 ft.

Electrical Notes.

An Illuminating Engineering Society.

We drew attention in these columns recently to the necessity of lighting matters being placed in the hands of trained men. In this connection Mr. L. Gaster, of 32, Victoria Street, S.W., writes to us suggesting the formation of an Illuminating Engineering Society. Such a society, he says, would contribute largely to advance and disseminate the knowledge relating to the science and art of illumination. "The merits and faults of the different illuminants now used, for public or other lighting purposes, would have a better chance to be discussed on a more scientific basis, and the sphere of useful application be more easily defined for each of them. There is no doubt that great economies can be derived from the judicious selection of the system of lighting adopted and the type of lamps, shades, reflectors, &c., used for different purposes. The annual expenditure for lighting purposes in the United Kingdom has been estimated lately to exceed £35,000,000, and it can easily be seen that only a small increase in the efficiency of the systems used will amount to considerable savings per annum.

"The formation of an Illuminating Engineering Society ought to receive a hearty support from the council of the gas and electric institutions, and of the newly-formed British Science Guild. The growing recognition of illuminating engineering as an art is indicated by the recent establishment at the American General Electric Co.'s works of a special department of illuminating engineering in charge of an expert. In the paper read by me before the Society of Arts recently, on the Progress in Electric Lighting, I suggested that there is a wide field open for the illuminating engineer, and I shall be glad to receive the names of any engineers willing to join me in the formation of an Illuminating Engineering Society in this country."

Technical Thermometry.

We have received from the Cambridge Scientific Instrument Company, Ltd., of Carlyle Road, Cambridge, a copy of a new catalogue on technical thermometry recently published by them. The first part of the list is devoted to showing the many applications of electrical thermometers; the electric resistance thermometers, thermo-electric thermometers and the Fery radiation pyrometer being described and explained in full detail. The list is divided into three sections—(1) dealing with the more particular commercial applications of pyrometers; (2) dealing with scientific or research work; (3) an appendix explaining the theoretical considerations of the instruments and giving tables of general interest. An interesting application of the electrical thermometers is that of measuring the temperature in cold stores. In the past the tedious method of sending a man round to read a mercury thermometer fixed in every chamber was adopted, but now it is possible by means of electrical thermometers for the engineer to read the temperatures throughout a large building from the engine-room. In the case of one large cold stores, the time saved in reading the thermometers by this method amounts to six hours a day.

Bankruptcies.

Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—adjudication.

During the week ending July 13th, twenty-three failures in the building and timber trades in England and Wales were gazetted.

S. Booth (late Peerless Patents Co.) builders' merchant, Stockton Heath. R.O., July 5th.

J. Fell, engineer and contractor, Notting Hill, W. First meeting, London Bankruptcy Court, July 20th, at 11. P.E., same, Aug. 9th, at 11.30. R.O., July 6th.

F. Mullins, plumber and decorator, Twickenham. R.O., July 4th.

Lightburn Bros., builders and contractors, Long Benton. P.E., Newcastle-on-Tyne C.C., July 26th, at 11. R.O., July 2nd.

J. Ridgway, builder and joiner, Lichfield. First meeting, O.R.'s, Wolverhampton, July 18th, at 12. P.E., Walsall C.C., July 25th, at 11.30. Liabilities, £631; deficiency, £333.

S. W. Gibbs, builder, Charlwood. Adj., July 5th.

Dix & Co., engineers, Cardiff. First meeting, O.R,'s, Cardiff, July 18th, at 11. P.E., Townhall, Cardiff, Aug. 7th, at 11.

R. E. Cole, contractor, Tottenham. R.O., June 25th.

W. J. Robinson, engineer, Twickenham. First meeting, 14, Bedford Row, W.C., July 19th, at 3. P.E., Brentford Town Hall, Aug. 17th, at 11.

F. Elliott, builder, Tamworth. Adj., July 2nd.

G. Crouch, builder, Birmingham. First meeting, 191, Corporation Street, Birmingham, July 18th, at 11. P.E., Birmingham C.C., Aug. 15th, at 2.

F. A. Simons, builders' merchant, Gravelly Hill. Adj., July 3rd.

C. Fairbank, builder, Birmingham. Liabilities, £897; deficiency, £66. R.O., July 5th.

J. F. Hinchliffe, builder, Penistone. First meeting, O.R.'s, Barnsley, July 18th, at 10.15. P.E., Barnsley C.C., same day, at 10.45.

M. Jenkins, contractor, Port Talbot. P.E., Neath Town Hall, Aug. 7th, at 11.30.

G. S. Cooper, builder, Echt. Liabilities, £200; assets, £129. Sequestration awarded.

G. Goulder, builder, Nottingham. Liabilities, £641; assets, nil.

J. T. Birtwistle, joiner and builder, Blackburn. Liabilities estimated by debtor at £497; proofs submitted, £1,274; assets estimated by debtor, £1,440, actually produced, £15 12s. Case adjourned for six months.

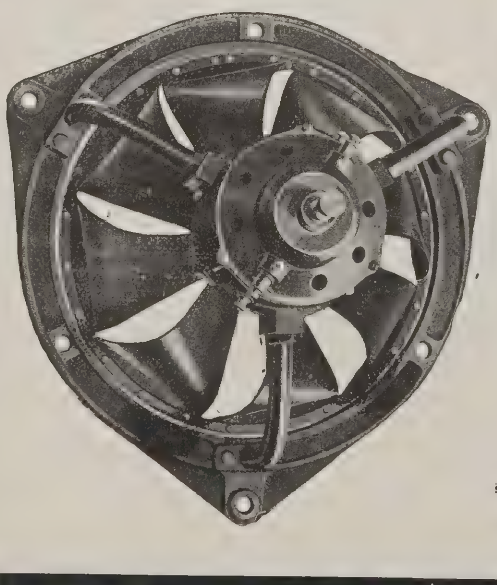
J. McGuire, late builder, Hull. Gross liabilities, £6,780; £6,405, fully secured; deficiency, £375.

To H.M. The King.

The Edison & Swan

To H.R.H. The Prince of Wales.

United Electric Light Company, Limited,
36 & 37, Queen Street, Cheapside, LONDON, E.C.
And at Birmingham, Belfast, Cardiff, Dublin, Dundee, Glasgow, Hull, Leeds, Liverpool, Manchester, Newcastle-on-Tyne, Sydney, N.S.W.



EDISWAN
FANS

1906 DESIGNS

For ALTERNATING or
DIRECT CURRENT.

WRITE FOR CATALOGUE.

Enquiries Answered.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

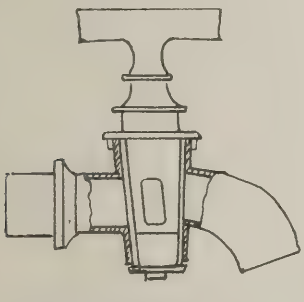
Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Plug Tap: Impounding Reservoirs.

ALDERSHOT. — CORNUBIENSIS writes: "(1) Please give a section of the old type of plug tap which has been superseded by the screw-down in works of water-supply (domestic fittings); (2) What may be considered a fair average cost per million gallons of constructing impounding reservoirs, valve tower, mains to town not included?"

(1) The accompanying sectional sketch shows one form of "plug-tap" as formerly in common use for water-supply draw-off taps, but long since discarded owing to the sudden concussion set up within the service pipes by the abrupt stoppage of the discharge, resulting frequently in great waste of water. The tap consists of a simple plug with a central waterway.



(2) It is not possible to usefully give a definite answer to this question as so much depends upon the circumstances of each individual case—for example, the locality, the facilities and suitability or otherwise of the site, convenience of procuring materials, the nature of the strata underlying the proposed reservoir, &c. Also, the cost will greatly depend upon the total volume of water to be impounded. Small reservoirs cost more per million gallons to construct than large ones. Then, again, some impounding reservoirs are lined with concrete, asphalt and other materials, and the accessary works in one case may be quite incomparable in extent to those in another. The cost of an impounding reservoir of 45 million gallons capacity within our experience, involving considerable excavation, culverting of stream, lining with concrete and asphalt, ranged between £700 and £800 per million, inclusive of all charges for works. Very frequently, however, large impounding reservoirs require no such lining, and comparatively little excavation of the site. Loch Katrine, for example, was converted into an impounding reservoir for the supply of Glasgow, and many other instances of a like character, but on a smaller scale, may be cited in which the physical features of the site selected minimise the artificial works involved. For these reasons, we are of opinion, therefore, that any general figure purporting to be a *fair average cost* would be more misleading to our correspondent than helpful—the possible range of variation being too wide.

Sketching at Wollaton Hall and Kirby Hall.

HALIFAX. — SUBSCRIBER writes: "(1) Are there any facilities for sketching at Wollaton Hall, Notts, and Kirby Hall, Northants? (2) How far is the latter from Northampton? (3) To whom should I apply for permission to sketch and measure at each place? (4) Is it necessary to apply by letter beforehand?"

(1) In the neighbourhood of Wollaton Hall there are many places of architectural interest. At Wollaton village, 2¼ miles west of Nottingham, there is a church containing some interesting monuments. Nottingham contains several fine examples of architecture. Of the castle built by William the Norman but little remains in the shape of a gate-house which has been defaced somewhat by modern insertions. The Perpendicular churches of St. Mary and St. Peter are worth studying, and the modern Roman Catholic church by Pugin is worth a visit. Goralston Church contains some Early English work, and Woodborough Church possesses a splendid Decorated chancel—the best in this part of the country. Interesting churches will also be found at Burton Joyce and Lowdham. A trip to Southwell Minster should be arranged while in this part of the country. Kirby Hall is situated in one of the most out-of-the-way parts of Northamptonshire, and for this reason is rather separated from the other architecture of the county. It was designed by John Thorpe, and the first stone was laid in 1570, as indicated in the original plans in the Soane Museum, Lincoln's Inn Fields, London. The Church of St. James at Gretton (restored) contains Early English work in the chancel and aisles, Decorated work in the transepts, and some Norman work. Picturesque seventeenth-century houses are also to be found at Gretton. The church at Great Weldon is mainly Early English in style. A visit to the stone quarries of Weldon will prove interesting to the architect. At Harringworth there is a church—St. John's—with a fine tower and spire, and a handsome wood screen. (2) Kirby Hall is about 35 miles as the crow flies from Northampton, and the journey from one place to the other will prove rather a tedious one. (3) Wollaton Hall is the residence of the owner, Lord Middleton, and Kirby Hall is a possession of the Earl of Winchelsea and Nottingham, whose address is Harlech, Merioneth. Application for permission to sketch had better be made direct to the owner in each case. (4) You will probably have no difficulty in getting permission to sketch on the spot at Kirby Hall; but Wollaton Hall is not open to the public. You would do well to obtain permission to sketch both cases beforehand.

H. Y. M.

Calverley Wood Grey Stone.

SOUTHPORT writes: "Please give some information about Calverley Wood grey stone—its price, and whether a suitable wearing stone for curbs around pavement lights."

A Yorkshire stone of uniform white colour and very durable. Examples: Colne Town Hall, and the lions in front of Bolton Town Hall. Its rate to London is 10s. 10d. per ton. Prices may be had on application to John C. Rowan, 28, Drewton Street, Bradford.

SIR ASTON WEBB ON SHOP ARCHITECTURE.

Writing in the *Nineteenth Century* on the rebuilding of Regent Street Quadrant, Sir Aston Webb takes up the general question of shop architecture. He says: "Of recent years 'unmitigated' shop fronts have been allowed to run riot through our streets, facilitated perhaps by the relaxed conditions in the latest Building Act. It seems to be considered essential by some to face the whole of the ground and first-floor fronts of a long series of houses with an appalling mixture of plate glass, looking-glass, and tawdry wood and brass work; to commence any architectural treatment on the second floor; and to cover the whole building over in due course with advertising announcements. Now even if, as some contend, the vulgar treatment results in increased sales for a time, there can be little doubt but that it leads in the long run to the deterioration of the character of the street and of the shops as first-class business property. It has been hinted, in the supposed interest of the shopkeepers, that provision should have been made for such shop fronts in the Quadrant itself, where surely if anywhere such a treatment should be an absolutely derogatory impossibility. Walking through our streets it is fairly obvious to the most superficial observer that it is not necessarily the best firms who have the largest window shows, but rather the contrary. Public taste, by common consent, has improved in recent years, and is hardly likely to be long impressed with these vulgar shop-fronts which entirely disregard all surrounding æsthetic and structural conditions, and vulgarise not only the buildings to which they are attached, but also the goods which are displayed in them. . . ."

THE SANITARY ENGINEER.

In his address to the Institute of Sanitary Engineers on the occasion of their annual summer meeting at Manchester on July 6th, Sir William Mather, M.I.C.E., said the Institute represented a branch of the engineering profession which was the most beneficial of all. There were the civil engineer, the hydraulic engineer, the electrical engineer, the mechanical engineer, but the sanitary engineer seemed to differ from every one of these, inasmuch as he laboured in a field in which, more or less, all branches were interested, but which had to do almost solely with the well-being of the people. Moreover, he had to work without many of those incentives and rewards which attached to other branches of the profession. It was a branch of engineering which did not offer many attractions to those who desired to win praise from their fellow-men or to erect monuments to themselves by the work of their hands. England, as they knew, enjoyed the reputation—or did enjoy the reputation some years ago—of being the most advanced nation in the world in sanitary science and in its application. He remembered how, after a visit some twenty years ago, an eminent German scientist, Dr. Virchow, reported that England was one hundred years behind Germany in education, but one hundred years ahead of Germany in sanitation. Sir William said he remembered Berlin when it was a city ugly and offensive in many respects, with no drainage system except that which was exposed to the street, with a vile atmosphere, bad water, and bad lighting. But after twenty years Berlin was now the pride of the German Empire.

Complete List of Contracts Open.

WITH a few exceptions, news of Contracts Open are not repeated after they have been published once in these columns, so that readers will find particulars in our previous issues of other contracts that still remain open.

Unless expressly stated to the contrary, all deposits required for bills of quantities, &c., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair-wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

July 19. Cultra.—*Erection of a dwelling-house* near Cultra Railway Station. Plans and specification may be seen and copies of the bill of quantities obtained at the office of Graeme-Watt & Tulloch, architects, 77A, Victoria Street, Belfast, on payment of a deposit of £1 1s., which will be returned to those contractors who submit a bona-fide tender. Sealed and endorsed tenders to be delivered at the above office not later than 10 a.m. on July 19.

July 19. Somerset.—*Erection of a bungalow residence*, on the Crowcombe estate, Somerset, for G. Connock Dyke. Plans and specification may be seen Crowcombe station, on application to John A. Tozer: and further particulars from G. C. Strawbridge, architect, 25, Alma Street, Taunton. Tenders to be delivered to G. C. Strawbridge or or before July 19.

July 19. Goldhanger.—*Alterations and additions* to the Gardener's Farmhouse, Goldhanger, for H. F. J. Coape-Arnold. Applications for plans, &c., to reach T. F. Tickner, architect, High Street Chambers, Coventry, not later than July 19.

July 19. Thornton Dale.—*Additions and repairs* to the Hall and out-buildings, Thornton Dale. Also for the various trades required in the erection of a house in Thornton Dale. Plans and specifications may be seen at the estate office. Tenders to be sent in to A. Hill, The High Hall, Thornton Dale, not later than July 19.

July 19. Devonport.—*Certain works required to complete the erection of a cart shed* at Pottery Quay for the Devonport Council. Plans, specifications and conditions may be seen and form of tender obtained at the Surveyor's Office, Municipal Offices, Ker Street, Devonport. Sealed tender, endorsed "Tender for Cart Shed, Pottery Quay," and addressed to J. F. Burns, borough surveyor, Municipal Offices, Ker Street, must be delivered on or before 10 a.m. on July 19.

July 19. Thornton-le-Beans.—*New school at Thornton-le-Beans* to accommodate about 60 children for the North Riding of Yorkshire County Council Education Committee. Contractors desirous of tendering for the work will be supplied with bills of quantities when ready, upon forwarding their names to Douglas Smith, secretary, County Hall, Northallerton. Such applications to be received not later than July 19.

July 20. Belfast.—*Building and completing a block of warehouses at Franklin Street, Brunswick Street and James Street South.* Quantities may be had on application to S. C. Hunter, building surveyor, 2, Wellington Place, Belfast. Plans, &c., may be inspected on application to H. Seaver, B.E., architect, Scottish Temperance Buildings, Belfast. Sealed tenders, endorsed "Warehouses," to be lodged with H. Seaver, not later than 12 o'clock noon, July 20.

July 20. Stretford.—*Erection of twenty pairs of semi-detached cottages* in Lacy Street, Stretford, for the Urban District Council. Plans, form of tender, &c., may be seen, and bills of quantities obtained, at the offices of John Bowden & Co., architects, 14, Ridgefield, Manchester, upon payment of £1. Tenders to be sent to the Chairman, Sanitary Committee, at the Council Offices, Old Trafford, on or before July 20, endorsed "Tender for Cottages."

July 21. Heath Town.—*Erection of new infants' department at Woden Road Council School, Heath Town.* Builders desiring to Tender for the work should apply to G. Balfour on or before July 21. Quantities will be supplied upon a deposit of £1 1s. being made. The drawings and specification can be seen at the County Education Offices, Stafford.

July 21. Inchlea.—The Directors invite Tenders for the *Mason, Carpenter, Slater, Plaster, Plumber, Painter, in the erection of a block of three houses* for workmen at Inchlea Crossing Loop, between Newtonmore and Dalwhinnie Railway Stations, for the Highland Railway Co. Plans and Specifications may be seen with Mr. William Roberts, Company's engineer-in-chief, at Inverness, or with the Station Agent at Kingussie. Sealed Tenders, addressed to Robert Park, secretary, The Highland Railway Co.'s Office, Inverness, and marked on the outside, "Houses, Inchlea," to be lodged by July 21.

July 21. Maesteg.—*Alterations and additions to Bethel English Baptist Chapel*, Maesteg. Plans and specifications may be seen with the Rev. R. Davies, Rhiaufa, St. Michael's Road, Maesteg. Sealed and endorsed Tenders to be delivered to G. Griffiths, Hon. sec., St. Michael's Road, Maesteg, on or before July 21.

July 21. Guildford.—(a) *The construction of a small store, external shelter and a pent roof* in connection with the new casuals block, and (b) external painting at the Infirmary Buildings, both at the Union Workhouse, Guildford. Specifications and plans of the proposed work can be seen on application to Edward L. Lunn, architect, 36, High Street, Guildford. Sealed tenders, endorsed "Building Work at Casual Block" and "Painting Infirmary," are to be sent to W. S. V. Cullerne, Union Offices, Commercial Road, Guildford, not later than 10 o'clock a.m. on July 21.

July 21. New Hey.—In connection with Sewage Works at New Hey, the Crompton U.D.C. solicit tenders for the following: Contract No. 1.—Erection of Buildings for sludge-pressing machinery and other works in connection therewith. Contract No. 2.—Supply and Installation of Suction Gas Producer Plant, gas engine pump, air compresser and receiver, water tanks, and all shafting, piping, &c. in connection therewith. Contract No. 3.—Supply and Installation of Sludge Press, dams, mixer, cast-iron overhead sludge tank, and all piping, &c. in connection therewith. Plans, specifications, and general conditions may be seen and forms of tender, with all necessary information, obtained on application to J. F. Wilkinson, M.Inst.C.E., Council's engineer, 301-304, Cathedral Street, Manchester, accompanied by a deposit of £1 1s. Sealed tenders, endorsed "New Hey Sewage Works—Contract No. —" (as the case may be), must be addressed to F. F. Gartside, clerk to the Council, Town Hall, Shaw, near Oldham, and be delivered at this office not later than 10 a.m. on July 21.

July 23. Fawley.—*External painting, alterations to offices, erection of new lavatories and cloakrooms, drainage, new offices, heating, ventilation, &c.*, at the school. Builders desirous of tendering may see plans and conditions of Contract, and obtain specification at the Office of W. J. Taylor, county surveyor, The Castle, Winchester, on and after July 9, between the hours of 9 a.m. and 5 p.m., Saturdays, 9 a.m. and 1 p.m. Plans and conditions of contract may also be seen at the school. A deposit of £1 1s. will be required for a copy of the specification. Deposits must be made by cheque payable to Hants County Council and crossed Bank of England, or particulars will not be sent. Tenders endorsed "Proposed Work, Fawley Council School," are to be delivered to H. Barber, clerk to the County Council, The Castle, Winchester, not later than 10 a.m. on July 23.

July 23. Risca.—*For the erection of public offices, stables and cartshed, together with boundary walls.* Plans and specifications may be obtained from A. J. Dardis, surveyor, Council Offices, Risca, on deposit of £2 2s. Separate prices must be shown for each of above works. Fair wages clause. Tenders must be sealed and marked "Tender for Offices," and delivered to T. S. Edwards, clerk to the Council, 24, Stow Hill, Newport, Mon., on or before July 23.

July 23. Porchester.—*Gravelling, erection of offices, ventilation, &c.*, at the Council school. Plans and conditions of contract may be seen and specifications obtained at the office of W. J. Taylor, county surveyor, The Castle, Winchester, on and after July 9, between the hours of 9 a.m. and 5 p.m. (Saturdays 9 a.m. and 1 p.m.). Plans and conditions of contract may also be seen at the school. A deposit of £1 1s. will be required for a copy of the specification. Deposits must be made by cheque payable to Hants County Council and crossed Bank of England, or particulars will not be sent. Tenders endorsed, "Proposed Work, Porchester Council School," are to be delivered to H. Barber, The Castle, Winchester, not later than 10 a.m. July 23.

July 23. Bexley.—*The extension of the existing Car Shed* to form a paint shop. *The erection of a steel structure for a repairing shop* for the Urban District Council. Drawings, specifications and bill of quantities may be seen at the manager's office, car sheds, Bexley Heath. Copies of the bill of quantities will be supplied on payment of 10s. Sealed tenders marked (1) "Paint Shop," (2) "Repairing Shop," as above to be delivered to C. G. Baynes, Oak House, Bexley Heath, Kent, not later than noon, July 23.

July 23. Braishfield.—*Repairs, painting, and provision of lavatory accommodation* at Braishfield school, Conditions of contract may be seen, and specification obtained of W. J. Taylor, county surveyor, The Castle. Winchester, between the hours of 9 a.m. and 5 p.m. (Saturdays 9 a.m. and 1 p.m.) Conditions of contract may also be seen at the school. A deposit of £1 1s. will be required for a copy of the specification. Deposits must be made by cheque payable to Hants County Council and crossed Bank of England. or particulars will not be sent. Tenders endorsed "Proposed Work, Braishfield Council School," are to be delivered to H. Barber, The Castle, Winchester, not later than 10 a.m. on July 23.

July 23. Fowey.—*Taking down old and erecting new building in Fore Street, Fowey.* Drawings and specifications can be seen on application to R. Vincent, Manager Fowey Wine Co., Fowey. Tenders to be delivered to the above on or before Monday, July 23.

July 23. Bagthorpe.—*Building alterations* at Bagthorpe Workhouse. Particulars and quantities may be obtained on application to Arthur Marshall, A.R.I.B.A., architect, King Street, and on payment to him of a sum of £2 2s. Tenders must be delivered to G. M. Howard, Poor Law Offices, Shakespeare Street, Bagthorpe, before 12 noon on July 23.

July 23. Mountain Ash.—*Erection of a mixed school* (to accommodate 400 children), with the necessary offices, boundary walls, &c., at Darranlas, Mountain Ash. Plans and specifications may be seen and forms of tender and bills of quantities obtained on application to W. H. Williams, architect, Town Hall, Mountain Ash, upon the deposit of £2 2s. The bill of quantities is to accompany the tender, but in a separate sealed and endorsed envelope. Sealed tenders and sealed bills of quantities, endorsed "Darranlas Mixed School," to be received by A. Morgan, Town Hall, Mountain Ash, not later than July 23.

July 23. London, W.—*Repairs to the gutters, parapets*, &c., at the Asylum in Cleveland Street, W., the specification for which may be seen by appointment, and bills of quantities obtained at the office of William Lockwood, architect, 12, Sherwood Street, Piccadilly Circus, W., on payment of £2 2s. Tenders, addressed to the Board of Management, will be received at the Clerk's Office, Cleveland Street Asylum, not later than 10 a.m. on July 23.

July 23. Tredegar.—*Erection of two semi-detached villas* for T. J. Price, Esq., Glanyrafon, Tredegar, to whom sealed and endorsed tenders should be sent by July 23. Plans and specification may be seen with W. S. Williams, architect, Tredegar.

July 24. Gorleston.—*Alterations to a building* adjoining the Tramway Depôt, Gorleston, and adapting the same for use as a manual instruction centre. Tenders are also invited for alterations to the offices of Church Road Board School, Gorleston, and Cobholm Island Boys' School. Plans and specifications may be seen at the Office of the Borough Surveyor, Town Hall, Great Yarmouth. Endorsed tenders to be delivered at the office of the education committee by noon on July 24.

July 24. Mutley.—*Erection and completion of a police and fire station at Ford Park, Mutley.* Plans and specification can be seen and forms of tender and bills of quantities obtained on deposit of £2 in cash. Sealed tenders, accompanied by the fully-priced out bill of quantities, to be delivered to J. Paton, borough engineer and surveyor, Borough Engineer's Office, not later than five p.m. on July 24. Conditions upon which forms of tender will be granted may be seen at his office.

July 24. Sherborne.—*Enlargement and alterations* to the General Post Office, Sherborne. Plans and specifications may be seen at the office of the architect, SS. John's Buildings, Sherborne, between the hours of ten and five. Tenders, endorsed, "Tender for Post Office," to be delivered free to Fooks & Douglas, solicitors, Sherborne, not later than ten o'clock, on July 24.

July 24. Mardy, Glamorgan.—*Pulling down and rebuilding the conservative working men's club*, Mardy, Glamorgan, for the trustees. Plans and specifications may be seen at the Club premises, Mardy. Tenders to be delivered to T. R. Leyshon, secretary, 24, North Terrace, Mardy, Glamorgan, on or before 6 p.m., July 24.

July 24. Guisborough.—*Additions and alterations to the King's Head Hotel*, Guisborough, for James Calder & Co., Alloa, Ltd., brewers. Plans, specifications, and conditions may be seen, and bills of quantities obtained of W. Duncan, architect and surveyor, 43, Albert Road, Middlesbrough, until Tuesday, July 24, 1906, on which day tenders are to be delivered to W. Duncan, endorsed "Tender."

July 24. Douglas (Isle of Man).—*Alterations and additions* to the Tynwald Street Schools (Girls' Department). For plans and specifications apply to G. & W. R. Kay, architects, Athol Street, Douglas. Fair wages clause. Full particulars as to the time of the commencement and completion of the work and conditions upon which tenders will be received may be had from the clerk of the School Board or the architects. Sealed tenders, endorsed "Tenders for Alterations to Tynwald Street School," to be delivered at the office of the Board on or before July 24.

July 24. London, S.W.—*Pulling down and reconstructing* the second portion of the Streatham Depôt, Streatham Hill, as a car shed for electric cars. Full information as to the conditions to be observed by Tenderers is given in the London County Council Gazette (price 1*d*., post free 1½*d*.), which can be obtained from P. S. King & Son, 2 & 4, Great Smith Street, Westminster, S.W. Tenders must be upon the official forms to be obtained from the Superintending Architect's Department (Highways Section), 13 Charing Cross, S.W., and no Tender will be received after 10 a.m. on July 24.

July 25. Dartford, Kent.—*Engineering alterations to laundries* at Darenth Asylum, Dartford, Kent, in accordance with drawings and specifications prepared by W. T. Hatch, M.I.C.E., M.I.Mech.E., engineer-in-chief. Drawings, specifications, conditions of contract and forms of tender may be inspected at the office of the Board, Embankment, E.C., and can then be obtained upon payment of a deposit of £2. Tenders, addressed as noted on the form, must be delivered at the office of the Board not later than 10 a.m. on July 25.

July 25. Sutton, Surrey.—*Stabling and other buildings* on the Belmont Asylum Estate, Sutton, Surrey, for the Metropolitan Asylums Board. A copy of the specification, conditions of contract, bills of quantities and form of tender can be obtained at the office of the Board, Victoria Embankment, E.C., on payment of a deposit of £1. The drawings can be seen by intending contractors at the office of T. W. Aldwinckle & Son, architects, 20, Denman Street, London Bridge, S.E., on production of the specification or form of tender. Tenders, endorsed in accordance with the instructions on the form of tender, must be delivered at the office of the Board by 10 a.m. on July 25.

July 25. Erdington.—*Erection of boundary walls* at the depôt in Spring Lane of the Erdington Urban District Council. Drawings may be seen, and copies of specification, quantities and form of tender obtained, upon application to H. H. Humphries, engineer and surveyor, the Council House, Erdington, where tenders, endorsed "Tender for Walls," must be delivered not later than twelve o'clock, July 25. Fair wages clause.

July 25. Ashford.—*Erection of a Kentish rag stone boundary wall*, about 1,200 feet long, at its cemetery, Canterbury Road, in accordance with plans and specification, which may be seen. Form of tender, and any other information, obtained on application to

W. Terrill, surveyor, Ashford, Kent, at his office, North Street. Sealed tenders, endorsed "Cemetery Walling," to be sent to F. Hughes Hallett, solicitor, clerk to the cemetery committee, 11, Bank Street, not later than five p.m., July 25.

July 26. York.—*Extending the destructor buildings*, Foss Islands Depôt. Specification and bill of quantities may be obtained of A. Creer, architect, Guildhall, York, on deposit of £1 1s. Tenders, endorsed "Destructor Buildings," to be delivered not later than noon on July 26.

July 26. Minehead.—*Erection of three houses and Garage*, in the Parks, Minehead, for J. K. Heard, Taunton. Sealed tenders to be left with W. J. Tamlyn, architect, Minehead, not later than July 26. For plans and further particulars apply to W. J. Tamlyn.

July 27. Orion.—*Erection of ante-room* to Inchberry Public Hall, Orton. Plans and specifications may be seen with A. B. Hunter, chairman of Inchberry Hall Committee, Orton Station, with whom offers, endorsed "Ante-Room," may be lodged on or before July 27.

July 27. London, S.E.—*Erection of a branch library* in London Street, West Greenwich, according to the drawings, specification, and conditions of contract and bond, which may be seen at the office of Wills & Anderson, architects, 24, Bloomsbury Square, London, W.C., between the hours of 10 and 12 on July 18, 19, and 20, 1906. Bill of quantities, prepared by Fowler & Hugman, F.R.S.I., may be obtained of the town clerk, Town Hall, Greenwich, upon payment of a deposit of £2 2s. The tenders, on the form supplied, sealed and endorsed "Tender for Branch Library," must be delivered to the Town Clerk, not later than 12 o'clock noon on July 27, 1906. Fair wages clause.

July 28. St. Annes-on-the-Sea.—*Technical School* at St. Annes-on-the-Sea, for the Urban District Council. Plans may be seen and bills of quantities obtained from the office of the county architect, Henry Littler, 16, Ribblesdale-place, Preston, by payment of a deposit of £2. Sealed tenders, endorsed "Technical School," must be sent so as to reach T. Bradley, Public Offices, St. Annes-on-the-Sea, not later than 12 o'clock noon on July 28.

July 28. Pontycymmer.—*Erection of a school hall* at Pontycymmer, for the English Calvinistic Methodist Church. Plans and specifications may be seen with Owen Jones, Saddler, Pontycymmer, or A. L. Thomas, architect and engineer, Church Street Chambers, Pontypridd. Sealed and endorsed tenders to be sent to Owen Jones on or before July 28.

July 28. Exeter.—*Erection of an elementary school for girls and infants* in St. James's Road, Exeter, in accordance with drawings and specifications which may be seen at the offices of James Jerman, F.R.I.B.A., architect and surveyor, Bedford Circus, Exeter, for the City Council. Bills of quantities may be obtained on payment of the sum of £1 1s. Tenders endorsed "Tender for St. James's School," to be sent to H. L. Parry, town clerk, Exeter, on or before July 28.

July 29. Youghall—*Erection of nine houses* for the accommodation of the working classes, on Cork Hill, including the drainage, water supply, fencing and roadway, according to plan and specification (amended in red ink by the town surveyor), which can be seen at the town hall between the hours of 11 a.m. and 4 p.m., for the Urban District Council. Each tender must be accompanied by a schedule giving the quantities and prices upon which said tender in founded. Contractors must examine the site before tendering, as no extras will be allowed under any circumstance. Each tender is to be on the prescribed form (to be obtained from J. J. O'Shea, clerk, Urban District Council, Town Hall, Youghal), and is to contain the genuine signatures of two solvent persons willing to enter into a joint and several bond for the due execution of said works within the time specified. This bond and contract is to be prepared by the Council's Law Adviser and paid for by the contractor. Tenders, endorsed "Tender for the Housing of the Working Classes," addressed to the Chairman, Town Hall, to be sent through the Post Office not later than July 29.

July 30. Warrington.—*A light telescopic ladder tower* for emergency work for the Electricity and Tramways Committee. Particulars and specification can be obtained on application to F. V. L. Mathias, A.M.I.E.E., Borough Electrical and Tramways Engineer, Howley, Warrington. Tenders must be sealed with wax, endorsed "Tender for Telescopic Ladder," and delivered not later than 12 o'clock noon on July 30, 1906, addressed to the Chairman of the Electricity and Tramways Committee, Town Hall, Warrington.

July 30. Glasgow.—*Sponge cloth laundry* at St. Rollox Stores. The drawings may be seen at the office of the company's engineer, Buchanan Street Station, Glasgow. where copies of the specification and schedule may be obtained on payment of £2 2s. Sealed tenders, endorsed "Tender for Construction of Sponge Cloth Laundry at St. Rollox," to be lodged with J. Blackburn, secretary, Caledonian Railway Company's Offices, 302, Buchanan Street, Glasgow, on or before July 30.

July 31. Derby.—*Enlargement of the branch post office* at Midland Road, Derby. Drawings, specification, and a copy of the conditions and form of contract may be seen on application at the Midland Road Branch Post Office, Derby, between the hours of 10 a.m. and 4 p.m. Bills of quantities and forms of tender may be obtained of the Secretary, H.M. Office of Works, Storey's Gate, London, S.W., on payment of £1 1s. Tenders must be delivered before 12 o'clock noon on July 31, addressed to the Secretary, H.M. Office of Works, &c., Storey's Gate, London, S.W., and endorsed "Tender for Derby Branch Post Office Enlargement."

July 31. West Hartlepool.—*Construction of steps* leading from the Longhill subway to the proposed road, in accordance with plans, sections, and specification to be seen, and approximate quantities obtained of N. F. Dennis, Borough Engineer and Surveyor, Municipal Buildings. Tenders, endorsed "Construction of Steps, Longhill Subway," and addressed to the Chairman of the Works Committee, are to be delivered at the office of the Town Clerk, 78, Church Street, not later than 4 p.m., on July 31.

July 31. Wolverhampton.—*Erection of additions to the administrative block* at the fever hospital in Green Lane. Plans may be seen, and specifications, bill of quantities, and form of tender obtained on application to G. Green, Borough engineer, Town Hall, Wolverhampton, upon payment of a deposit of £1 1s. Tenders, addressed to the chairman of the Health Committee, to be delivered at the Town Clerk's Office by 10 a.m. on Tuesday, July 31. (Fair wages clause.)

July 31. Rothwell Haigh.—*Erection of an engine-house and pump-room* at their new workhouse, Rothwell, Haigh, in accordance with the drawings and specifications prepared by W. E. Richardson, architect, Rothwell, near Leeds. Applications for bills of quantities and forms of tender must be made to the architect on or before July 21, and bills of quantities will be supplied to such applicants only. Drawings may be inspected at the offices of the architect, and tenders, on forms provided, must be delivered to F. W. Mee, Union Offices, Hunslet, Leeds, by 10 o'clock on Tuesday, July 31.

Aug. 1. Pontypridd.—*Erection of a large chapel and schoolroom* for the English Baptist Church at Hopkinstown, Pontypridd. Plans and specifications may be seen of A. L. Thomas, A.M.I.C.E., architect and engineer, Church Street Chambers, Pontypridd. Sealed and endorsed tenders to be sent to the Rev. Samuel Davies, Oakfield, Pwllgwaun, Pontypridd, on or before Aug. 1.

Aug. 2. Alnwick.—*Erection of new residence* at Alnwick for Wm. Percy, Esq. The plans and specifications may be seen of G. Reavell, Junr., Alnwick, and the tenders, duly endorsed, must reach him not later than noon, August 2.

August 15. Lostock Hall, near Preston.—*Erection of a new Public Elementary School* at Lostock Hall, near Preston. The plans may be seen and bills of quantities obtained at the office of Henry Littler, county architect, 16, Ribblesdale Place, Preston, by payment of a deposit of £2. Tenders must be delivered before 12 o'clock noon on August 15, 1906, sealed and endorsed, to W. S. Woodcock, Esq., Council Offices, Bamber Bridge, near Preston.

No date. Sherborne.—*Small one-storey lace factory* at Sherborne. Builders desirous of tendering apply by letter to W. H. Radford, C.E., Albion Chambers, Nottingham.

SANITARY.

July 19. Stockport.—*Manual and team labour and materials required in sewering* the following streets within the Borough: Longford Road, Lewis Road, Welland Street, Denstone Road, Tyrrell Road. Plans, sections, specifications, and conditions may be seen, and forms of tender obtained, on application to J. Atkinson, Borough Surveyor's Office, Stockport. Tenders, addressed "The Borough Surveyor, Stockport," sealed and endorsed "Tender for Sewering Longford Road, &c.," to be left at his office at or before noon on July 19. Fair wages clause.

July 23. London, N.—*Construction of a 12-in. and 9-in. surface-water sewer* and appurtenant works in Hendon Lane and Waverley Grove of about 520yds. in length. The proposed works to be constructed in accordance with drawings, specifications, &c., which may be inspected at the offices of the engineer and surveyor to the Council, at Church End, Finchley. Copies of the specification and schedules, together with form of tender, may be obtained from the engineer on application, accompanied with a deposit of £2. Sealed tenders, endorsed "Hendon Lane, &c., Sewer," and addressed to E. H. Lister, clerk to the Council, Council Offices, Finchley, N., to be sent not later than 5 o'clock on July 23.

July 23. London, W.—*Barging away house refuse and road sweepings* from their Wharf at Lots Road, Chelsea, for the period commencing 1st October, 1906, and ending 31st March, 1908, and for an optional period thereafter of two or four years. Proposals must be made upon and strictly in accordance with the printed form of tender, which may be obtained, with further particulars, on application at the Town Hall, Kensington High Street. The party whose tender is accepted will be required to enter into a written contract and provide two good and sufficient sureties in the sum of £500 for the due performance thereof. The expense of the contract will be borne by the Council. Fair wages clause. Tenders, sealed and endorsed "Tender for Barging Work," must be delivered to W.C. Leete, town clerk, Town Hall, Kensington, W., not later than 4 o'clock in the afternoon of July 23, 1906. Parties submitting tenders must, when delivering their tenders, deposit with the borough treasurer, at the Town Hall, Bank of England notes to the value of £25 as a guarantee of good faith (the deposit, however, not to be enclosed with the tender).

July 24. Bromley.—*Sewering, levelling, paving, metalling, channelling, and making good streets*, known as Albert Road, Devonshire Square and Sandford Road, situate within the Borough, in accordance with plans, sections, and specifications prepared by the borough engineer, which may be seen, and bills of quantities, &c., obtained, on payment of 10s. 6d., of F. H. Norman, town clerk, Bromley, Kent. Tenders, endorsed, "Tender for Works of Street Improvement," must be delivered to F. H. Norman, not later than 3 o'clock on July 24, 1906.

July 25. Dartford, Kent.—*Building cesspool and constructing new drainage* for four cottages and gate porter's lodge, at Gore Farm Convalescent Hospital, Dartford, Kent, in accordance with drawing and specification prepared by W. T. Thatch, M.Inst.C.E., M.I. Mech.E., engineer-in-chief. Drawing, specification, conditions of contract, and form of tender may be inspected at the office of the Board, Embankment, E.C., and can then be obtained upon payment of a deposit of £1. Tenders, addressed as noted on the form, must be delivered at the office of the Board not later than 10 a.m. on July 25, 1906.

July 25. Barrow-in-Furness.—*Construction of the following lengths of surface-water sewers* inclusive of all manholes, lampholes, gullies and connections and outfalls. Sewer No. 1.—422 yards lineal 3ft. by 2 ft. egg-shaped brick sewers. Sewer No. 2.—687 yards lineal 5ft. 9in. by 3ft. 10in. egg-shaped brick sewers; 120 yards lineal 4ft. 3in. by 2ft. 10in. egg-shaped brick sewers; 338 yards lineal 4ft. by 2ft. 8in. egg-shaped brick sewers; 260 yards lineal 3ft. 3in. by 2ft. 2in. egg-shaped brick sewers; 220 yards lineal 3ft. by 2ft. egg-shaped brick sewers. Pipe sewers.—100 yards lineal 21in. stoneware pipe sewer; 40 yards lineal 18in. stoneware pipe sewer; 170 yards lineal 15in. stoneware pipe sewer; 120 yards lineal 12in. stoneware pipe sewer; 120 yards lineal 9in. stoneware pipe sewer. Also for certain works in filling up existing brick sewers. Plans and sections may be seen at the borough engineer's office, and copies of specification and bills of quantities and forms of tender obtained on application to the borough treasurer upon payment of the sum of £5. Tenders and fully priced bills of quantities, each in a separate properly sealed envelope, endorsed "Tender for Surface Water Sewers," must be delivered at the Town Clerk's Office not later than 12 o'clock noon on July 25.

July 27. Dunham Massey.—*Construction of the following works of sewerage*, within the township of Dunham Massey:—1,170 lineal yards or thereabouts of 18-inch diameter stoneware pipe and concrete sewer between Lowerhouses and Broadheath; 80 lineal yards or thereabouts of 15-inch diameter stoneware pipe and concrete sewer, and 36 lineal yards or thereaaouts of 15-inch diameter cast-iron pipe and concrete sewer under the railway at the cattle bridge, 500 yards or thereabouts west of the Broadheath station on the L. & N.W. railway, together with all shafts, manholes, and other appurtenant works in connection therewith for the Bucklow Rural District Council. Plans, sections, detail drawings, and specification can be seen, and bill of quantities with form of tender and any other information obtained on application to J. P. Wilkinson, M.Inst.C.E., 301, Cathedral Street, Manchester, and on deposit of the sum of £2 2s. Sealed tenders, endorsed "Dunham Massey Sewerage, Contract No. 4," must be addressed and delivered to G. Leigh, clerk to the Urban District Council, Union Offices, Knutsford, Cheshire, not later than 10 o'clock a.m., on July 27, 1906.

July 30. Chadderton.—*Construction of earthenware and cast-iron pipe sewers*, &c., for the sewerage of the Middleton Junction District. Drawings and specifications may be seen, and quantities, Form of tender, and all other particulars obtained, on application at the offices of James Diggle & Son, civil engineers, Hind Hill Street, Heywood, and 14, Victoria Street, Westminster, S.W., on payment of a sum of £3. Tenders, endorsed "Tenders for Middleton Junction Sewerage, Contract No. 14," to be sent to H. Hoyle, clerk to the Council, Town Hall, Chadderton, not later than July 30.

July 30. Beckenham.—*Extension of Dust destructor and also for repairs and alterations to the existing cells* for the Urban District Council. Particulars and forms of tender may be obtained on application to John A. Angell, surveyor, on the production of a receipt from the collector (who attends at his office daily from 9 to 10 a.m. only, except on Tuesdays, when his hours are from 9 a.m. to 1 p.m.) for a deposit of £2. Tenders, duly sealed and endorsed "Tenders for Dust Destructors," to reach F. Stevens, clerk to the Council, not later than 4 p.m., July 30. Fair wages clause.

July 31. London, S.W.—*Construction of filter beds* at Barn Elms, in the Western District. Forms of tender and contract, with specification, may be obtained on application to the District Engineer, Commercial Road, Pimlico, on production of an official receipt for the sum of £5. Such payments and applications must be made between the hours of 10 and 4 (except on Saturdays). Tenders, enclosed in sealed envelopes, addressed to the Clerk of the Board, Metropolitan Water Board, Savoy Court, Strand, W.C., and endorsed "Tender for Filter Beds, Western District," must be delivered at the Offices of the Board, not later than 10 a.m. on July 31, 1906.

August 5. Edmonton, Alta, Canada.—*Destructors for the City Sanitary Deparment.* Present population approximately 12,000. Propositions and plans to be fully descriptive of capacity, &c., with arrangements for readily extending the plant. Tenders with plans addressed "City Commissioners, Edmonton," to be delivered not later than August 5, 1906, to Geo. J. Kinnaird, secretary-treasurer, Edmonton.

ENGINEERING.

July 19. Hull.—*Construction of a covered concrete service reservoir* at Keldgate, to hold about 10 million gallons. Fair wages clause. Drawings may be seen and copy of specification and form of tender may be obtained at the office of F. J. Bancroft, City water and gas engineer, Alfred Gelder Street, Hull, on payment of £2. Cheques and postal orders to be made payable to T. G. Milner, city treasurer, Hull. Tenders endorsed "Tender for Covered Service Reservoir," are to be addressed to the Chairman of the Water and Gas Committee, and delivered at the town clerk's office not later than July 19.

July 20. Oran (Algeria).—*Water-supply works* for the town, 82,000 francs, deposit 2,200 francs. Apply to Prefecture, Oran, July 20.

July 20. Alberique (Spain).—*Electric lighting of the town.* Apply to Alcaldia Constitucional, Alberique, Valencia, by July 20.

July 23. Delamere (Cheshire).—*Construction of covered reservoir in concrete* of a capacity of 200,000 gallons; erection of pumping station and caretaker's house; erection of stone boundary wall enclosing the site; enlarging two boreholes from a diameter of 18in. to 20in. to a depth of about 60ft.; quarrying of stone and provision of plant for same, at the quarry on the Crown land adjoining the site; laying about 12 miles of 8in. water mains, in four sections of three miles each, or thereabouts, from the site to Middlewich, for the Middlewich Urban District Council, at their waterworks site, Delamere, Cheshire. Further particulars and specifications can be obtained on application by letter to Frederick William Stocks, engineer, Town Hall, Middlewich. Sealed tenders endorsed respectively "Reservoir," "Pumping Station, &c.," "Boundary Wall," "Boreholes," "Quarrying," or "Laying Water-Mains," to be delivered to C. F. Lawrence, clerk, Town Hall, Middlewich, before 10 a.m., on July 23.

Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, *Great New Street, Fetter Lane, E.C.*

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Cardiff.—For the erection of new buildings for University College. Mr. W. D. Caröe, architect, Whitehall Place, London.

	Library.	Main Buildings.
D. David & Sons	£24,034	£85,563
W. Williams	23,102	79,983
McCormick & Sons, London	22,920	82,758
D. W. Davies	22,800	81,200
Leslie & Co., London	22,604	81,434
Hayward & Wooster, Bath	22,412	85,175
Stephens, Bastow & Co., Bristol	22,236	82,279
H. Willcock & Co., Wolverhampton	21,814	77,931
A. I. Dolman, Gloucester	21,800	74,000
J. Allan & Sons	21,706	80,218
J. Barnsley & Sons, Birmingham	21,218	74,780
Higgs & Hill, South Lambeth	21,000	79,990
Parnell & Son, Rugby	20,480	72,160
T. Rowbotham, Birmingham	20,161	71,985
W. Hopkins, Birmingham	20,000	73,000
Holloway Bros., London	19,680	70,154
E. Turner & Sons*	18,862	68,985
W. King & Son, London	18,444	67,083

* Accepted.
(Rest of Cardiff.)

Devonport.—For alterations and additions to business premises Nos. 40 and 41 Fore Street, for Mr. F. Goodman, Mr. Edgar M. Leest, M.S.A., architect. Quantities by Messrs. Leest & Adams.

Wakeham Bros.	£2,494	0	0
J. H. Palmer	2,390	0	0
T. May & Son	2,355	0	0
Pearce Bros., Devonport	2,297	0	0
A. N. Coles	2,297	0	0
Jenkin & Sons, Devonport	2,295	0	0
Pearn Bros.	2,254	0	0
H. J. Allen, Devonport	2,024	0	0
S. Roberts*	1,950	0	0

*Accepted. (Rest of Plymouth).

Downe (Bromley).—For the erection of a new school to accommodate 120 children, for the Kent Education Committee. Mr. Wilfred H. Robinson, architect, 44, Bedford Row, London, W. C.:—

H. Chapman	£2,547	14	0
W. Owen & Sons	2,250	0	0
W. H. Smith	2,208	3	1
T. W. A. Philpot	2,185	0	0
E. F. Selby	2,134	0	0
T. Crosley & Son	2,080	0	0
Patman and Fotheringham	2,023	0	0
Treasure Bros.	1,950	10	0
W. H. Hyde	1,944	0	0
B. E. Nightingale	1,936	0	0
W. J. Zealey	1,922	15	6
J. & E. Bowyer	1,893	0	0
Hall and Jacobs	1,887	15	0
R. Avard	1,884	0	0
W. J. Fryer & Co.	1,881	0	0
W. Holt & Son	1,880	0	0
T. Knight	1,879	0	0
A. E. Tong	1,850	0	0
S. Page & Sons	1,848	0	0
Thomas and Edge	1,834	0	0
W. F. Blay	1,826	0	0
C. E. Skinner	1,808	0	0
E. Wallis	1,738	0	0
J. A. Davison	1,675	0	0
J. Podger & Son, Bromley*	1,670	0	0

*Provisionally accepted.

Gosport.—For the erection of a new school in Clarence Square, to accommodate 330 boys, for the Gosport and Alverstoke Education Committee. Mr. H. Frost, surveyor, Gosport:—

Wakeham Bros., Plymouth	£5,814
J. Wright, Lee-on-the-Solent	5,777
J. Tanner, Southsea	5,244
Jenkins & Son, Southampton	5,165
E. & A. Spriggings, Portsmouth	5,100
Munday, Portsmouth	5,067
G. T. Hughes, Wokingham	4,969
J. Hunt, Gosport	4,812
F. Privett, Portsmouth	4,757
G. W. Baster, Southsea	4,589
W. Learmouth, Portsmouth	4,569
C. M. Dash, Gosport	4,383
C. J. Lear & Son,* Alverstoke	4,346

* Accepted.

Hornsea (Yorks.)—For the construction of a concrete sea-wall, promenade, and timber groynes. Mr. W. T. Douglass, M.I.C E., 15, Victoria Street, Westminster, consulting engineer to the Hornsea U.D.C.:—

E. H. Page	£22,580	5	8
S. Pearson & Sons	20,443	10	10
G. Lawson	19,225	0	0
J. Riley	18,246	14	4
Hardy & Atkinson	18,222	5	5
J. Best	17,314	1	5
Holme & King	16,786	4	7
C. Greenwood	14,300	0	0
Harman & Langton	14,282	4	0
R. H. B. Neal, Ltd.	13,614	0	0
W. Fasey	13,253	9	5
R. C. Brebner & Co.	13,205	0	0
Leggott & Speight	12,796	14	0
W. Griffiths & Co.	12,725	8	9
W. Hill & Co.	£12,571	11	5
G. Bell & Sons	12,554	16	3
Brumby Robinson	12,069	16	0
W. Gradwell & Co.	12,051	6	10
A. Fasey & Son*	11,875	6	5
A. Braithwaite & Co.	10,977	10	6

Engineer's estimate, £11,650.
* Accepted.

Horbury (near Wakefield).—For the erection of 38 houses and shop. Messrs. Garside & Pennington, architects, Pontefract and Castleford:—

Donovan & Scott, Dewsbury	£5,245	0	0
Thorpe and Beddard, Normanton Common	5,243	10	0
C. Prince, Horbury	4,950	0	0
G. Hellier, Hemsworth	4,950	0	0
J. Bramham & Son, Altofts, near Normanton*	4,570	10	0
J. H. Neal & Son, Glass Houghton	4,465	0	0

*Accepted.

Leeds.—Accepted for works required in connection with erection of police station, &c., buildings, at the junction of Meadow Lane and Great Wilson Street, for the Watch Committee.

Excavator, Mason and Bricklayer—P. Rhodes	£3,997	0	0
Carpenter and Joiner—B. Mawson	1,244	0	0
Plumber and Glazier—H. Lindley	698	0	0
Smiths and Ironfounders—J. Bagshaw & Sons, Batley	351	0	0
Slaters—Pickles Bros.	211	7	0
Heating—H. Braithwaite & Co.	208	0	0
Plasterer—J. Phillips	170	0	0
Painters—F. Jackson & Co.	154	14	0
Electric Lighting—V. Neville & Co.	125	17	0

(Rest of Leeds.)

Leicester.—For Leicester Corporation water supply, Derwent (Section No. 2, Contract No 1, Trent Bridge). Messrs. Everard, Son, & Pick, engineers, 6, Millstone Lane, Leicester:—

A. Thorne, Westminster	£12,486	4	2
Butterley Co., Derby	11,536	2	11
Eastwood, Swingler & Co., Derby	11,035	12	5
A. Findlay & Co., Motherwell	10,584	15	8
Heenan & Froude, Manchester	10,230	6	2
W. Muirhead & Co., London, E.C.	10,167	15	3
J. Butler & Co.'s Trustees, Leeds	10,011	14	11
Braithwaite & Kirk, West Bromwich	9,199	16	9
A. Handyside & Co., Derby	9,002	15	5
Cleveland Bridge & Engineering Co.,* Darlington	8,459	19	6

Accepted.

London.—For the construction of reservoirs, &c., at Fortis Green, for the Metropolitan Water Board:—

W. Kennedy, Ltd., London	£130,167	3	0
Wilkinson Bros., Finsbury Park	105,941	0	0
W. Griffiths & Co., London	101,939	4	4
F. W. Trimm, Dorking	100,937	0	0
T. Adams & Sons, Wood Green	98,585	8	1
S. Pearson & Son, Westminster	91,827	8	6
J. Mowlem & Co. London	87,783	0	0
T. Docwra & Son, London	85,340	12	5
C. A. Zadig & Co., London	84,756	19	0
G. Trentham, Birmingham	82,703	5	11
J. Aird & Sons, Lambeth	82,464	1	1
D. R. Paterson, London	80,936	5	10
G. Hay & Co., Westminster	80,721	12	11
W. Muirhead & Co., London	77,318	13	3
R. H. B. Neal, Ltd., Plymouth	76,544	19	11
Boulding & Yerburgh, Westminster	76,529	0	0
J. A. Ewart, Westminster	75,990	5	11
Kelletts Ltd., London	75,673	9	5
J. Moran & Son, Westminster	75,631	16	0
Smith & Co., Westminster	75,211	0	5
Davies, Ball & Co., Westminster	74,197	11	10
W. Lawrence & Son, Tottenham	74,000	0	0
A. Braithwaite & Co., Leeds	73,737	10	4
E. & E. Iles, Wimbledon	73,447	0	0
A. E. Nunn, London	72,072	9	4
Kirk & Randall, London	71,774	0	0
W. Pattinson & Sons, Westminster	71,665	9	2
C. Wall, Ltd., London	70,283	12	11
Pethick Bros., London	69,999	0	0
W. Moss & Son, Loughborough	68,800	18	1
J. Byrom, Ltd., Bury, Lancs.*	60,278	17	9

For making, testing, and delivering 42in. and other cast-iron pipes and castings required in connection with above reservoirs:—

D. Y. Stewart & Co.	£6,489	1	6
W. J. Oakley	6,483	0	0
Cochrane & Co., Dudley	5,131	4	0
Cochrane & Co., Middlesbrough	5,028	12	0
J. Oakes & Co.	5,024	13	10
Holwell Iron Co.	5,011	5	7
Staveley Coal & Iron Co.	4,843	5	6
Stanton Ironworks Co.*	4,471	19	3

* Recommended for acceptance.

London, N.—For the making-up of Station Avenue, Winchmore Hill, and Broomfield Avenue, and part of Osborne Road, Palmer's Green, for the Southgate U.D.C. Mr. Charles G. Lawson, surveyor:—

T. Turner	£3,410
Rogers & Co.	3,015
J. Hampton	2,957
T. Adams	2,905
Griffiths, Limited	2,806
G. R. Mann	2,718
E. Frost*	2,586

*Accepted.

London, N.—For the erection of new classrooms for the infants' department, cookery and manual training centres, and new offices for the divisional clerk, at the Bowes Road Schools, New Southgate, for Middlesex C. C. Mr. H. G. Crothall, architect:—

Stapleton & Son	£3,294	0	0
E. K. Wilton	3,292	0	0
Newby Bros.	£3,289	0	0
Nicholls & Son	3,210	0	0
W. Tout	3,147	0	0
Barber & Sons	3,020	0	0
A. Porter	3,018	0	0
Treasure & Son	2,980	0	0
J. Groves & Sons	2,973	0	0
J. Stewart	2,924	0	0
W. Dudley	2,887	5	0
W. Lawrence & Son	2,784	0	0
Mattock & Parsons	2,779	0	0
H. Knight & Son*	2,654	0	0

*Recommended for acceptance.

London, S.W.—For the construction of underground sanitary conveniences in Station Road, Balham, for the Wandsworth Borough Council:—

				A.		
D. R. Paterson	£2,577	4	6	£77	14	6
G. H. James	2,328	4	7	33	7	4
Twyfords Limited	2,297	0	0	78	0	0
Doulton & Co.	2,260	0	0	51	0	0
Davis, Bennett & Co.	2,190	0	0	51	10	0
B. E. Nightingale	2,099	0	0	38	0	0
C. Gray	2,012	0	0	24	0	0
Spencer, Santo & Co.	2,000	0	0	57	0	0
Mellows & Co.	1,987	0	0	72	6	2
G. Jennings Limited	1,982	9	8	60	7	0
W. Wallis	1,957	15	6	41	14	4
Rowe & Co.	1,930	0	0	35	0	0
J. Garrett & Sons	1,905	0	0	23	0	0
E. Wall*	1,790	0	0	40	0	0

A. Extra if white glazed facings in first-quality bricks in lieu of best seconds. *Recommended for acceptance.

London, W.—For the erection of receiving wards and porter's lodge at workhouse, Woodfield Road, for the Paddington Guardians. Mr. F. J. Smith, architect, Parliament Mansions, Victoria Street, S.W.:—

	Building.			Fence, Walls, &c.		
C. North	£5,339	0	0	£749	0	0
T. L. Green	5,197	0	0	796	0	0
Mattock & Parsons	5,060	0	0	779	0	0
Aldin Bros. & Davis	4,800	0	0	700	0	0
F. G. Minter	4,789	0	0	782	0	0
J. and M. Patrick	4,751	0	0	706	0	0
C. Wall	4,675	0	0	727	0	0
B. E. Nightingale	4,578	0	0	678	0	0
Appleby & Sons	4,465	0	0	672	0	0
H. Kent	4,456	0	0	769	0	0
Patman and Fotheringham	4,320	0	0	677	10	0
S. Pocock	4,300	0	0	743	0	0
I. G. Baker	4,269	0	0	710	0	0
Dearing & Sons, Halliford Street, N.*	4,205	0	0	650	0	0
Fryer & Co.	4,000	0	0	710	0	0

* Accepted.

Micheldever (Hants).—For the erection of a parish room, for the Earl of Northbrook. Messrs. Hall, Pain, & Goldsmith, surveyors, 48, West Street, Fareham:—

T. Grace	£1,150	0	0
C. Wright	1,107	0	0
Goodall & Sons	1,049	0	0
F. J. Eddols	1,027	1	0
Jenkins & Son	984	0	0
J. J. Wise	969	0	0
Mussellwhite & Sapp, Basingstoke	949	13	0

Paignton (Devon).—For the supply, delivery, and laying of a 7in. cast-iron water-main, together with the sluice-valves, etc., for the Urban District Council. Mr. Fred. W. Vanstone, engineer, Palace Chambers, Paignton.

R. C. Brebner & Co., Edinburgh	£4,439	1	4
W. Grisenthwaite, Penrith	4,294	3	1
R. E. Narracott, Stoke Gabriel, Totnes	4,222	18	3
G. Pollard & Co., Taunton	4,213	1	11
Hawking & Best, Teignmouth	4,147	2	7
Woodman & Son, Exeter	4,121	0	0
E. Tabor, Cambridge	3,965	11	0
E. Pike, Torquay	3,837	13	2
H. Drew, Paignton	3,787	0	0
M. Bridgman, Paignton	3,755	4	9
Clay Cross Co., Chesterfield	3,729	0	3
Smith & Co., Westminster	3,723	2	7
Jenkins & Son, Leamington*	3,720	0	0

* Provisionally accepted.

Radcliffe (Manchester).—Accepted for the erection of Carnegie public library:—

C. Brierley, Bury... £4,921

Saltash.—For the erection of premises in Fore Street, for Mr. F. A. Rawling. Mr. Edgar M. Leest, M.S.A., architect. Quantities by Messrs. Leest & Adams.

T. May, Plymouth	£759	0	0
Pearce Bros., Devonport	467	17	0
W. V. Alford, Saltash	436	4	0
W. H. Rothery,* Saltash	426	0	0

* Revised tender accepted.

Seaford (Sussex).—For the erection of stabling, riding school, and house for the Seaford West Co.:—

D. Lee, Polkington, Yorks	£4,563	15	0
J. Barker & Co., Kensington	4,178	0	0
J. H. Smedley, Leicester	4,153	16	8
W. F. Blay, Dartford	4,100	0	0
F. Gough & Co., Hendon	4,094	0	0
Kirk & Randall, Woolwich	3,993	0	0
Peerless Dennis & Co., Eastbourne	3,978	0	0
Godfrey Bros., Seaford	3,936	0	0
Cook & Son, Crawley	3,880	0	0
H. Brown, Eastbourne	3,815	0	0
W. Wilkinson,* Claremont Road, Seaford	3,651	0	0

* Accepted.

July 23. London, S.E.—*Laying on an electric light wiring installation* at the two underground conveniences, Sutton Street, St. George-in-the-East. Persons tendering must submit the names and addresses of two substantial persons willing to be jointly and severally bound for the due and proper performance of the contract. Fair wages clause. Contractors will be prohibited from assigning or underletting their contract to anyone without having previously obtained the written consent of the Council thereto. The drawings may be seen, and copies of the stipulations, specifications, schedule, and form of tender may be obtained by applying to M. W. Jameson, borough engineer, 15, Great Alie Street, Whitechapel, E., between 10 a.m. and 12 noon, upon paying £1 deposit. Tenders, endorsed "Tender for Electric Light Installation, Underground Conveniences, Sutton Street," should be sent to G. W. Clarke, 15, Great Alie Street, Whitechapel, E., in the envelope supplied, so as to arrive on or before 12 o'clock noon on July 23.

July 24. Cowes (I. of W.) Urban District Council.—*Construction and erection of a steel bridge over railway.* Apply to J. W. Webster, engineer's office, July 24.

July 24. Featherstone.—*Works, &c., required in widening the bridge*, carrying Common Side Lane over the railway at Featherstone, for the Directors of the Lancashire & Yorkshire Railway. Plans can be seen, and form of tender and specification obtained on application at the Engineer's Office, Hunt's Bank, Manchester. Tenders, endorsed "Tender for Widening Bridge at Featherstone," to be in the hands of R. C. Irwin, secretary, Hunt's Bank, Manchester, not later than 10 o'clock on July 24.

July 24. London, W.—*Rebuilding of Perivale Bridge, Greenford Road.*—The drawings and specifications may be seen and forms of tender, together with bill of quantities and other particulars may be obtained from Charles Jones, M.Inst.C.E., borough engineer, Town Hall, Ealing, W., any day during office hours, upon payment of a deposit of £2 2s. Sealed tenders, in the envelopes provided, endorsed "Tender for Re-building Perivale Bridge," must be delivered to G. E. Brydges, town clerk, Town Hall, Ealing, W., not later than 9.30 a.m. on July 24.

July 25. Rainhill.—*Plant* for the County Asylum, as follows:—(*a*) *One independent surface condensing plant with electrically-driven pumps, together with the necessary pipework.* (*b*) *One water softening and purification plant.* Plans and works may be seen, conditions, specification and form of tender may be obtained from the Engineer's Office at the Institution. Tenders to reach J. Gornall, clerk's office, County Asylum, Rainhill, not later than 5 p.m. on July 25 endorsed on the outside "Water Softening."

July 25. Sutton, Surrey.—*Installation of Electric Lighting* at the Downs School, Banstead Road, Sutton, Surrey, in accordance with drawings and specification prepared, by W. T. Hatch, M.Inst.C.E., M.I.Mech.E., engineer-in-chief. Drawing, specification, conditions of contract, and form of tender may be inspected at the office of the Board, Embankment, E.C., and can then be obtained upon payment of a deposit of £2. Tenders, addressed as noted on the form, must be delivered at the office of the Board, not later than 10 a.m. on July 25.

July 25. Middelburg (Holland).—*Canal construction works*, 960,000 florins. Apply to Provincial Government, Middelburg, July 25.

July 25. Norwich.—*Erection of new boiler house, seating for boilers, and economiser*, at the Norwich Workhouse. Plans and conditions of contract may be seen, and bills of quantities obtained on payment of £1 1s. at the offices of Morgan & Buckingham, architects and surveyors, 3, Redwell Street, Norwich. Sealed tenders, endorsed "Tender for Boiler House," to be delivered to H. Stone, Guardians' Office, St. Andrew's Street, Norwich, not later than 3 o'clock on July 25. Fair wages clause.

July 27. Sunderland.—(*a*) *Two 250-kw. synchronous motor generators, 5000—240 volts.* (*b*) *High tension and low tension switchgear for the electricity department.* The specifications and forms of tender can be obtained on application to the Borough Electrical Engineer, J. F. C. Snell, M.Inst.C.E., Town Hall, Sunderland, and on payment of a deposit of £1 1s. for each specification. Sealed tenders addressed to the "Chairman of the Electricity and Lighting Committee," Town Hall, Sunderland, must be delivered to F. M Bowey, Town Hall, Sunderland, not later than 12 o'clock noon on July 27. Tenders to be endorsed "A" or "B" according to the item tendered for.

July 30. Stanley and West Hallam.—*Waterworks at Stanley and West Hallam*, Derbyshire, including laying 4,466 yards of 6in., 3,050 yards of 4in., and 1,910 yards of 3in. cast iron pipes, with all appurtenances, and the construction of a brick service reservoir (capacity 90,000 gallons). Plans may be seen and specification and bills of quantities obtained, at the offices of Elliott and Brown, engineers, Burton Buildings, Parliament Street, Nottingham, after July 16, 1906, on deposit of £2 2s. Sealed tenders, addressed to J. W. Newbold, Council Offices, Derby, and endorsed "Tender for Waterworks," to be delivered on or before the first post on July 30, 1906.

July 31. Shanghai.—*For the supply and delivery c i.f. Shanghai of the following plant:*—for the Municipal Council. *a.*—Two 600 kilowatt Steam-Turbo Dynamos, or, as an alternative, Two 600 kilowatt Steam Dynamos, together with Condensing Plant, certain Pipes and Valves, Motor-Generator, Switchboards, &c. *b.*—Two Water-tube Boilers, with Feed-water Heaters, Superheater and Chain-grate Stokers, Feed Pump, Pipes, Valves, &c. Specifications, general conditions, and forms of tender can be obtained from Preece & Cardew, 8, Queen Anne's Gate, Westminster, S.W., on payment of a deposit of £2 for each section. Extra copies of the specification and general conditions for each section can be obtained on payment of 5s. each (non-returnable). Sealed tenders, endorsed "Shanghai Electricity Supply," are to be addressed to Preece & Cardew, 8, Queen Anne's Gate, Westminster, S.W.. and delivered before 12 o'clock noon on July 31.

Sept. 4. Lancaster.—*Proposed reconstruction of steam heating arrangements and hot-water service.* The last date for receiving tenders for the above work has been extended to Sept. 4. Contractors please note. J. T. Cheetham, clerk and steward.

No date. Workington.—*Heating of Victoria Infant School* by hot water (radiators and piping) are requested to send in their names to E. J. Hepworth, secretary, Education Offices, Workington, as early as possible.

PAINTING AND PLUMBING.

July 19. Culmstock.—*External and internal painting*, &c., of the School House and School, according to specification to be seen at the School between 9 a.m. and 5 p.m., Saturday excepted. Tenders must be received by R. W. Beadon, Woodgate, near Wellington, before 9 on July 19.

July 20. Chartham Downs, Kent.—*Painting, repairs*, &c., and other works in connection therewith to Section No. 3. The Specifications can be seen at the Office of W. J. Jennings, Architect, 4, St. Margaret's Street, Canterbury, and copies of the bills of quantities obtained therefrom on depositing with him the sum of £5. Tenders to be delivered to the Asylum, addressed to the Chairman of the Committe of Visitors, not later than 10 o'clock on July 20.

No Date. Whittington.—*Painting and colouring, inside only, New Whittington and Whittington Moor Schools*, for the Derbyshire Education Committee, to be done during August. Apply for Specification, J. J. Creed, correspondent, Old Whittington, Chesterfield.

July 20. Norwich.—*Painting and other work* at Norwich Technical Institute. Stipulations of contract and specification may be seen and forms of tender obtained on application to A. E. Collins, city engineer, Guildhall, Norwich. Tenders on the forms supplied, enclosed in envelopes sealed with sealing wax, endorsed "Painting," and addressed to the Chairman of the Higher Education Sub-Committee, must be delivered to A. E. Collins, not later than 2.30 p.m on July 20.

July 24. Birkenhead.—*Painting the Woodside ferry building and approaches.* Further information, specifications, and forms of tender may be obtained on application at the office of the Ferries Manager, Woodside Ferry, Birkenhead. Tenders (which must be on the printed form supplied) sealed and endorsed "Tender for Painting Ferry Buildings," must be sent in to A. Gill, town clerk, Town Hall, Birkenhead not later than 5 o'clock in the afternoon of July 24, 1906.

WILLIAMS'

Steel & Concrete Piles

ALWAYS IN STOCK READY FOR USE.

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Driving
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36, Lime Street, LONDON, E.C.

And at DAGENHAM DOCK, ESSEX.

Telephone: No. 375 AVENUE.

IRON AND STEEL.

July 24. London, E.C.—*Supply of steel bridges*, 12 to 70ft. spans, about 1340 tons, for the South Indian Railway Company, Ltd. Specifications and forms of tender may be obtained at the company's offices. Tenders, addressed to the Chairman and Directors of the South Indian Railway Company, Ltd., and marked "Tender for Bridges," must be left with H. W. Notman, company's offices, 55, Gracechurch Street, E.C., not later than 12 noon on July 24. A charge will be made of 20s. for each copy of the specification. Copies of the drawings may be obtained at the office of Sir George B. Bruce, 3, Victoria Street, Westminster, on payment of 5s. per sheet.

July 26. Dublin.—*Supply of* 5500 *tons steel rails*, 400 *tons steel soleplates*, 150 *tons steel fishplates*, invited by the Directors of the Great Southern and Western Railway, in accordance with the specifications, which can be obtained on application to the Company's Engineer, Inchicore, Dublin. The specifications for the rails (2), fishplates (2) and soleplates are upon separate forms, and a charge of 5s. will be made for each specification. Tenders, which must be made on the form attached to the specification, must be delivered to F. B. Ormsby, Kingsbridge Terminus, Dublin, endorsed "Tender for Rails, &c.," before 10 a.m. on Thursday, July 26

July 30. West Hallam.—*Supply and free delivery at West Hallam, Derbyshire, of cast-iron pipes, special castings, &c.*, in connection with the water supply of Stanley and West Hallam, near Ilkeston, for the Shardlow Rural District Council. The contract will comprise about 186 tons of 6in. pipes, 76 tons of 4in. pipes, and 35 tons of 3in. pipes. Full particulars, with specification, bills of quantities, and form of tender, may be obtained from Elliott & Brown, engineers, Burton Buildings, Parliament Street, Nottingham, on deposit of £2 2s. Sealed tenders, addressed to J. W. Newbold, Council Offices, Becket Street, Derby, and endorsed "Tenders Iron Pipes," to be delivered on or before July 30, 1906.

Aug. 2. Ashford, Middlesex.—*Supply Delivery, and erection on their premises at Ashford, Middlesex, of the following plant and materials* for the Managers of West London District Schools. Contract No. 1.—Pipework and sundry apparatus for Exhaust Steam Heating System. Contract No. 2.—Pipe Trenches and sundry Builder's Work. Contract No. 3.—Chimney Shaft, Economiser Chamber, and Flues. Contract No. 4.—Two 50 kw. Steam Dynamos (high-speed D.A. vertical compound engines), and Boosters, an Electric Motor, Additions and Alterations to Switchboard, some 200 yds. of Cable, and sundry other work. Contract No. 5.—Alterations and extensions to Steam, Exhaust, Feed and Drain Pipes, a Green's Economiser, &c. Copies of the general conditions applicable to all the contracts, the specifications, drawings, and forms of tender may be obtained by application to F. G. Beeching, clerk to the managers, Ashford, Middlesex, at the schools, on payment of a deposit of £3 3s. for each section. Copies of the above-mentioned documents may be seen (but not obtained) at the offices of F. H. Medhurst & Lloyd, consulting engineers, 13, Victoria Street, Westminster, from whom all particulars of the work may be obtained. Persons tendering may inspect the schools on week-days, between the hours of 10 a.m. and 4 p.m. The tenders must be delivered to F. G. Beeching (as per instructions with the forms) not later than 6 p.m. on Thursday, Aug. 2.

MISCELLANEOUS.

July 20. Vienna, Lemberg, Krakau, Stanislau(Austria).—*Supply of iron goods, chains, screws, nails, dog-spikes, spades, tools, files, &c.* Apply, K.K. Staats eisenbahndirektion in each of the above towns, by July 20.

July 20. London, W.—*Supply to their electricity works of best cylihder oil, crank-chamber oil, paraffin engine oil, best rope waste, and stoneware pipes*, for the Town Council of the Borough of Ealing. Tender forms and full particulars can be obtained on application to A. E. Lewis, A.C.I.S., Electricity Department, Town Hall, Ealing, W., and must be delivered not later than noon, July 20, 1906.

ROADS AND CARTAGE.

July 19. Edinburgh.—*Whinstone paving in the carriageways of*:—(1) Appin Terrace; (2) Roseburn Place; and (3) Lane at 5 East Preston Street; also for concrete paving in carriageways of:—(4) Springvalley Terrace, and (5) Gibson Street; also for granolithic footways at:—(6) Arboretum Road and Kinnear Road. Plans may be seen, and schedules of quantities and specifications obtained, on application to the City Road Surveyor, City Chambers. Tenders, sealed within the official envelopes supplied, must be lodged with the subscriber by 10 a.m. on July 19.

July 20. Manchester.—*Execution of the following work*:—Sewering, draining, paving, &c.; Side Street, Clayton, North Manchester. Sewering, draining, paving, &c.; Colville Street, Newton Heath, North Manchester. Sewering, draining, paving, &c.; Grey Street, Newton Heath, North Manchester. Reconstruction of 18-in. pipe sewer in Stuart Street, from Mill Street to Cavendish Place, Bradford, North Manchester. Construction of sewer, Eileen Grove, &c., Rusholme, South Manchester. Sewering, draining, paving, &c., passage behind 1 to 21, Hora Street, and adjoining 21 and 23, Hora Street, and 2, Freda Street, Bradford and Ardwick, North and South Manchester. Forms of tender may be obtained on application to the Paving, &c., Department (surveyor's office), and must be returned to the Chief Clerk, Paving, &c., Department, Town Hall, Manchester, before 10 a.m. on July 20.

July 23. Waltham Holy Cross.—*Making up of Fairmead Road, High Beech*, for the Urban District Council. Plans and specifications may be seen on application to W. T. Streather, Town Hall, Waltham Abbey. Tenders, in envelopes supplied, to reach the office of F. C. E. Jessopp, clerk to the Council, by 12 noon on July 23.

July 23. Cheshunt.—*Construction of a 40ft. road* about 600ft. long, situated in the Manor House Grounds, Cheshunt. The plan and specification can be seen and forms of tender obtained from R. H. Jeffes, Engineer and Surveyor to the Council, Manor House, Cheshunt. Persons tendering must take off their own quantities. Sealed tenders, in envelopes supplied, and addressed "Chairman, Cheshunt Urban District Council," to be delivered at or before 4 p.m., July 23.

July 24. London, N.W.—*Execution of certain road-making and paving works* in the following: Lushington Road, Harlesden; Drayton Road, Harlesden; Lydford Road, Willesden Green. Plans and specifications may be seen, and all further particulars obtained, upon application to O. Claude Robson, M.Inst.C.E., engineer to the Council, Public Offices, Dyne Road, Kilburn, N.W. The Tenders, upon printed forms, and endorsed "Private Streets," to be delivered at the offices of the Council not later than 4 p.m. on July 24. A £10 note to be deposited with each tender.

July 25. Heanor.—*Compound ten tons steam road roller*, to be delivered on or before September 29, for the Urban District Council. Tenders, with drawings and specifications attached, endorsed "Tender for Steam Roller," to be sent to John Holbrook, surveyor, Town Hall, Heanor, Derbyshire, by sixo'clock, on July 25.

July 25. Neath.—*Supply of* about 900 tons of granite (or other approved) metalling, chippings, and siftings, and about 500 tons of limestone, metalling, and screenings. Copy of specification may be obtained on application to D. M. Jenkins, borough engineer, Gwyn Hall, Neath, to whom sealed tenders, endorsed "Tender for Road Metalling," are to be delivered on or before July 25.

July 25. Wanstead.—*2,000 tons (more or less) of Guernsey granite or Quenast stone*, broken to 1½in. cube, delivered to Snaresbrook Station (G.E. Ry.) by such instalments and in such quantities as may be directed in writing from time to time by the Council's surveyor, beginning Sept. 1 next. Forms of tender can be obtained on application to the Surveyor at the Council Offices. Tenders, sealed and enclosed in the envelopes provided, are to be delivered at the Council Offices not later than Wednesday, July 25. Payment will be made as follows—viz.: 50 per cent. at the Council meeting in January, 1907; 50 per cent. at the Council meeting in July, 1907.

July 25. Ticehurst.—*Steam rolling* in their district as from the first week in November, 1906. The contractors will be required to supply one or more rollers with driver and mate to each, scarifiers, sleeping-vans, water-carts, with horse and man to each, and all necessary appliances. The work to be undertaken either by the piece or by daywork, as the Council may determine. Forms of tender may be obtained from W. N. Wood, surveyor, Ticehurst, on a stamped addressed foolscap envelope being forwarded. Tenders, sealed and endorsed "Steam Rolling," mustbe sent so as to reach J. C. L. Andrews, clerk to the Council, Wadhurst, Sussex, not later than July 25.

July 25. Wanstead, N.E.—*Ten ton steam roller with driver*, attendant, fuel, &c., to work in the district during the months of September, October, November, and December, 1906, for the Urban District Council. Forms of tender, with further particulars, can be obtained on application to C. H. Bressey, surveyor, Council Offices, Wanstead. Tenders, sealed and enclosed in the envelopes provided, are to be delivered at the Council Offices not later than July 25.

July 26. Wallsend.—*Macadamising, kerbing, cementing, &c.*, certain roads. Plans and specifications may be seen and forms of tender obtained on application to G. Hollings, borough surveyor, corporation offices, Wallsend. Tenders, sealed, and endorsed "Tender for new streets, &c.," to be received by W. V. Mulcaster, 28, Sandhill, Newcastle-on-Tyne, on or before noon of July 26.

July 28. London, W.—*Execution of the following contracts* for the Paddington Borough Council No. 25B.—Renewal with 8in. or 9in. by 3in. by 5in. Creosoted deal wood blocks of existing wood paving in Edgware Road (all materials and labour; about 3,650 super yards). No. 25C.—Renewal with 9in. by 3in. by 4in. West Australian hardwood blocks of existing wood paving in Praed Street (all materials and labour; not more than 5,100 super yards. No. 51.—Purchase of old West Australian hardwood blocks to be taken up from the areas above mentioned. No. 2.—Construction of a sewer with manholes, lampholes, drain connections, and contingent works and accessaries in Queen's Gardens. Printed conditions, specifications, schedule and bills of quantities, and forms of tender may be obtained on application between the hours of 10 a.m. and 4 p.m. (Saturdays 10 a.m. and 1 p.m.) at the office of or by letter addressed to the Borough Surveyor, Town Hall, Paddington, W. In the case of contract No. 52 a payment of £1 must be made for a set of documents. No tender will be considered unless made strictly in accordance with and on one of the printed forms issued, and it must be sealed, endorsed according to the description of contract, and delivered at the Town Hall, Paddington, W., by July 28. Letters of enquiry respecting any of the above contracts should have the number of the contracts written in the left-hand corner of the outside of the envelope.

July 28. Lye and Wollescote.—*About 3,000 lin. yds. of Rowley granite kerbing, and 10,300 sup. yds. of granite sett paving*, to be laid on the Stourbridge and Halesowen main road, situate in the Urban District of Lye and Wollescote, for the Worcestershire County Council Highways and Bridges Committee. Drawings may be inspected, and specification, bill of quantities, and form of tender obtained, on application, and payment of a fee of £2 2s., to J. H. Garrett, Shire Hall, Worcester. Sealed tenders, marked "Tender for Granite Sett Paving," must be delivered to J. H. Garrett not later than 10 o'clock on July 28.

July 31. West Hartlepool.—*Construction of Bangor Street*, the passage-way leading from Clarence Road to Hart Road, on the north side of "The Willows," and the New Roadway, being diversion of Mainsforth Terrace to the westward, from Grantham Street to the Longhill Sub-way. Plans, sections, and specifications can be seen, and forms of tender, with approximate quantities obtained, upon application to N. F. Dennis, borough engineer and surveyor, Municipal Buildings. Tenders, endorsed "Construction of Streets, &c.," and addressed to the Chairman of the Works Committee, are to be delivered at the office of the Town Clerk, 78, Church Street, not later than 4 p.m. on July 31, 1909.

July 31. Mitcham, Surrey.—*600 tons of hard blue Guernsey granite spalls*, to be delivered in such quantities as may be ordered, free of all delivery charges and cartage, to the Workhouse, Western Road, Mitcham, Surrey, for the Guardians of the Holborn Union. The granite must be weighed as sent in, and the Workhouse weighbridge weights charged for. Tenders (by letter) must be delivered to J. A. Battersby, Holborn Union Offices, 53, Clerkenwell Road, E.C., not later than 12 o'clock noon, on July 31.

August 1. Litherland.—*About 250 tons of the best Welsh macadam, and about 25 tons of granite chippings*, during the ensuing twelve months for the District Council. The macadam and chippings to be delivered at the Alexandra or Langton Dock at such times and in such quantities as may be required. Samples must be forwarded carriage paid to A. H. Carter, surveyor, Public Offices, Sefton Road, Litherland, not later than Aug. 1. Specification and form of tender can be obtained on application to the Surveyor, any morning between 9 and 11 am. Tenders, endorsed "Tenders for Macadam and Chippings," to be sent to J. W. A. North, 15, Lord Street, Liverpool, not later than Aug. 1.

August 1. Widnes.—*Private improvemeut works* in each of six streets and nine passages situate at Simm's Cross. Plans, sections, and specifications may be seen and forms of tender with bills of quantities obtained at the office of John S. Sinclair, A.M.I.C.E., borough surveyor, Town Hall, Widnes, upon deposit of £2 2s. Tenders, sealed and endorsed "Tender for Private Improvement Works," to be sent, on forms supplied, to H. S. Oppenheim, Town Clerk's Office, Town Hall, Widnes, on or before August 1. Fair wages clause.

TOO LATE FOR CLASSIFICATION.

July 19. Edinburgh.—*Mason and Brick, Carpenter, Joiner, Plumber, Slater, Plaster and Cement Works* in connection with the Cottage proposed to be erected at Martyrs' Cross, near Glencorse, for the Edinburgh and District Water Trust. Schedules of Quantities may be had on application to E. C. Carse, architect, 37, Frederick Street, Edinburgh, at whose office plans of the proposed Cottage may be seen. Tenders endorsed "Cottage at Martyrs' Cross, Glencorse," must be lodged with W. Boyd, clerk to the Trust, 12, St. Giles' Street, Edinburgh, not later than July 19, at 10 a.m.

July 19. Huddersfield.—*Painting and decorating* of the Huddersfield Technical College. The successful tenderer will be required to execute a contract the draft of which may be inspected at the Town Clerk's Office, Town Hall, between 10 and 4 o'clock. Specifications and general conditions may be seen, and bills of quantities and forms of tender obtained, on application at the offices of the Borough Engineer and Surveyor, 1, Peel Street after the 11th inst. Sealed tenders, endorsed "Tender for Painting Technical College," signed in the handwriting of the tenderer or his agent, and addressed "Town Clerk, Town Hall, Huddersfield," must reach him not later than 10 a.m. on July 19.

July 20. Inverness.—*Additions to Farraline Park Public School*. Plans and specifications to be seen with W. Mackintosh, architect, Inverness, from whom schedules may be obtained, and tenders to be lodged with him by July 20, 1906.

July 21. Inverness.—*Block of Three Houses for Workmen* at Inchlea Crossing Loop, between Newtonmore and Dalwhinnie Railway Stations for the Highland Railway Co. Plans and specifications may be seen with W. Roberts, the Company's Engineer-in-Chief, at Inverness, or with the Station Agent at Kingussie. Sealed tenders, addressed to the Secretary of the Company, The Highland Railway Co.'s Office, Inverness, and marked on the outside, "Houses, Inchlea," to be lodged at his office on or before Saturday, July 21.

July 23. Huddersfield.—*Painting and other work at various schools*. General specification and conditions may be seen, and forms of tender, and short specification for each school, obtained on application at the offices of K. F. Campbell, M.Inst.C.E., borough engineer. Sealed tenders, endorsed, "Tender for Painting Mold Green School," or as the case may be, signed in the handwriting of the tenderer or his agent, and addressed "Town Clerk, Town Hall, Huddersfield," must reach him not later than 10 a.m. on July 23.

July 23. Kirkmichael.—*Renovation* of the Parish Church of Kirkmichael. Plans and specifications to be seen with J. Robertson, architect, Inverness; also copies of both plans and specifications to be seen with the Rev, Mr. Frazer, The Manse, Kirkmichael, Ballindalloch, and tenders to be lodged with Mr. Robertson, on or before July 23.

July 24. Stocksfield-on-Tyne.—*Painting* of the above-named school premises for the managers of the Broomley Council School. Forms of tender can now be obtained and specifications and conditions of contract seen at the schools, or at the office of W. H. Ord, solicitor, Swinburne Street, Gateshead, to whom tenders are to be delivered not later than July 24.

July 25. London, N.—*Painting certain portions of the outside* of workhouse at Edmonton, for the Guardians of the Edmonton Union. Specifications and forms of tender can be obtained at the Offices of Stuart Hill, architects, 106, Cannon Street, E.C., on deposit of £1 1s. Tenders, to be marked "Tender for Outside Painting," to be delivered to F. Shelton, clerk, Lower Tottenham, on or before 9 a.m., on July 25, 1906.

July 25.—*Cleaning and painting works* at Joyce Green Smallpox Hospital, Dartford, Kent, in accordance with specification prepared by Mr. W. T. Hatch, M.Inst. C.E., M.I.Mech.E., Engineer-in-Chief. Specification, conditions of contract, and form of tender may be inspected at the Office of the Board, Embankment, E.C., and can there be obtained upon deposit of £1. Tenders, addressed as noted on the form, must be delivered at the Office of the Board, not later than 10 a.m. on July 25, 1906.

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Standard Copper	per ton	79	0	0	79	10	0
Do. Strong sheets ...	do.	95	0	0	96	0	0
Lead, soft foreign	do.	16	5	0	16	7	6
Do. English	do.	16	5	0	16	10	0
Do. pipes...	do.	19	5	0	19	10	0
Do. sheets	do.	18	15	0	19	0	0
Galvanised Corrugated sheets	do.	12	12	6	12	15	0
Spelter G.M.	do.	26	10	0	26	15	0
Angles, Scotland	do.	6	15	0	7	0	0
Bars, do.	do.	7	17	6	7	19	0
Marked bars, Staffs. ...	do.	8	10	0		—	
Common bars do. ...	do.	6	7	6	6	10	0
Angles, M'boro.	do.	6	10	0	6	12	6
Joists do.	do.	6	2	6	6	5	0
		£	s.	d.	£	s.	d.
Angles, Midlands	do.	6	10	0	6	15	0
Joists, Midlands	do.	6	15	0	7	0	0
Girder plates, Midlands ...	do.	7	10	0	7	12	6
Angles, Foreign, c.i.f. Thames	do.	6	10	0	6	15	0
Tees do. do. do.	do.	6	12	6	6	15	0
		£	s.	d.	£	s.	d.
Joists, Foreign, c.i.f. Thames	per ton	6	2	6	6	5	0
Channels do. do. do.	do.	6	7	6	6	10	0
Plates do. do. do.	do.	7	0	0	7	5	0
Tin, Foreign	do.	164	0	0	164	10	0
Do. English ingots ...	do.	166	0	0	167	0	0
Zinc, sheets, Silesian ...	do.	30	0	0	30	10	0
Do. do. Vielle Montaigne	do.	30	0	0		—	

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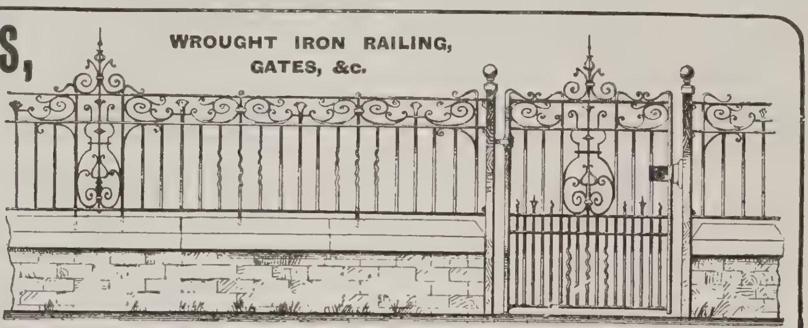
Deals, Archangel Yellow, 3rd 3×11	per std.	11	0	0		—	
Do. do. do. 3rd, 3×9	do.	11	10	0		—	
Do. Atter (Abo.) do. & White, Inf. 5th, 3×8	do.	8	10	0		—	
Do. do. (do.) do. do. 3×9	do.	8	0	0		—	
Do. do. (do.) Yellow, unsorted, 3×9	do.	9	10	0		—	
Do. do. (do.) do. do. 2½×7	do.	9	15	0		—	
Do. Constantza, White, 3rd, 3×11	do.	9	10	0		—	
Do. do. do. 5th, 3×11	do.	6	0	0	6	10	0
Do. Gefle, Yellow, 4th, 4×11	do.	8	15	0		—	
		£	s.	d.	£	s.	d
Deals, Gefle, Yellow 4th, 4×9	per std.	8	15	0		—	
Do. Kem do. 3rd 3×9	do.	11	10	0		—	
Do. Langror. do. 3rd, 3×8	do.	12	5	0		—	
Do. do. do. 4th, 3×8	do.	10	10	0		—	
Do. do. do. do. 3×7	do.	10	5	0		—	
Do. do. do. do. 2½×7	do.	10	5	0	10	10	0
Do. do. do. 5th 3×9	do.	10	5	0		—	
Do. do. do. do. 3×7	do.	9	15	0		—	
Do. Montreal, Red Pine, Dry 1st, 4×9	do.	15	5	0	15	15	0
Do. Quebec, Spruce 1st, 3×9	do.	14	10	0		—	
Do. do. do. do. 3×8	do.	11	10	0		—	
Do. do. do. 2nd, 3×7	do.	9	0	0		—	
Do. Soderham, Yellow, 4th, 4×9	do.	11	5	0		—	
Do. Stugsund do. 4th, 2½×7	do.	9	15	0		—	
Battens, Atter (Abo.), Yel- & White, Inf. 5th, 2×7	do.	9	0	0		—	
Do. do. (do.) do. do. do. do do. 2×5	do.	8	10	0		—	
Do. do. (do.) do. do. do. do. do. 2×4	do.	9	5	0		—	
Do. do. (do.) do. do. unsorted 2×3	do.	9	10	0		—	
Do. Gefle, Yellow, Inf. 5th, 2×9	do.	8	5	0		—	
Do. Larvik, do. unsorted, 2×2	do.	8	15	0		—	
Do. Montreal Pine, 1st, 2×11	do.	20	0	0		—	
Do. do. do. do. 2×9	do.	14	15	0		—	
Do. do. Red Pine, do. 2×8	do.	11	10	0		—	
Do. do. do. do. do. 2×7	do.	11	10	0		—	
Do. do. do. do. do. 2×6	do.	11	0	0		—	
Do. do. do. do. do. 2×5	do.	10	10	0		—	
Do. Mo. Dry White, 2nd, 2×9	do.	9	10	0		—	
Do. Soderham Yellow, 4th, 2×9	do.	11	5	0		—	
Flooring Boards, Fredriksstad, Yellow & White, 1×7	do.	0	8	6		—	
Do. do. do. do. 1×6½	do.	0	8	3		—	
Do. do. do. do. 1×6	do.	0	8	6		—	
Do. do. Mixed Yellow, 1×6	do.	0	10	0		—	
Do. do. do. do. 1×5½	do.	0	9	3		—	
Do. do. do. do. 1×5	do.	0	9	5		—	
Do. do. do. do. 1×4½	do.	0	8	6		—	
Do. do. Yellow, 3rd, 1×7	do.	0	9	9		—	
Do. do. do. unsorted 1×7	do.	0	10	6		—	
Do. do. do. do. 1×5½	do.	0	9	6		—	
Do. do. do. do. 1×5	do.	0	9	3		—	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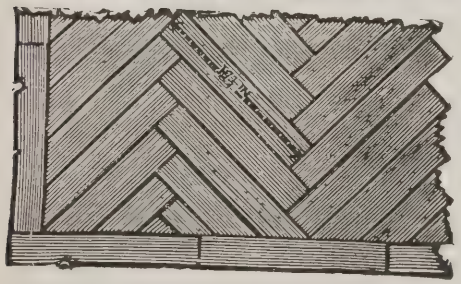
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17¼ × 3 × 2	8 3	7 9	
17¼ × 3 × 1½	6 9	6 3	

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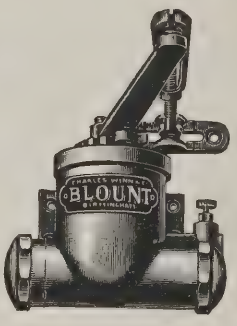

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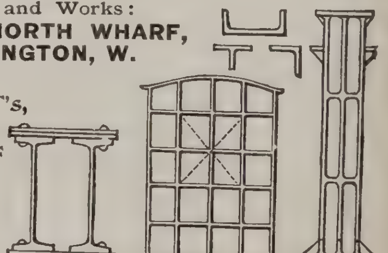


THE BUILDERS' JOURNAL
AND ARCHITECTURAL ENGINEER.

July 18th, 1906.

CONCRETE AND STEEL SUPPLEMENT (MONTHLY)

THE DESIGN OF REINFORCED CONCRETE BRIDGES.

By Charles F. Marsh, M.I.C.E., A.M.I.M.E.

The employment of reinforced concrete has enabled engineers to design bridges which for lightness of construction and adaptability to the conditions of their sites can compare favourably with bridges previously constructed with any other material.

M. Considère, by the employment of hooped concrete, has produced a bridge at Plougastel of the cantilever and bowstring girder type, with spans of 317¾ feet, in which the members show no greater dimensions in elevation than would be necessary in a steel bridge of like design. A view of one span of this bridge is shown in Fig. 1.

The adaptability of reinforced concrete for arched bridges is well demonstrated in Fig. 2, which is produced from a photograph of a bridge constructed by M. Hennebique at Liège for the exhibition of 1905.

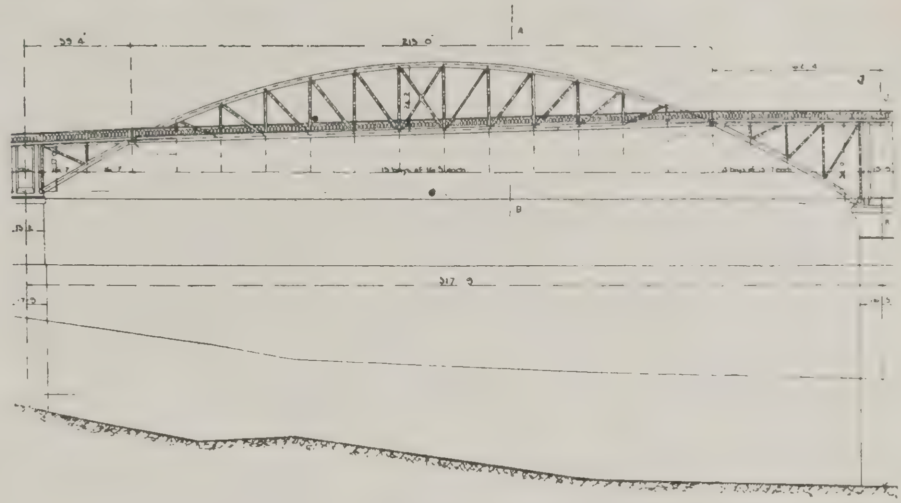


FIG. I.—BRIDGE AT PLOUGASTEL,

Two Classes of Bridges.

For the purpose of this article, two classes of bridges will be discussed—those with girder supports, and those formed with arches. Parallel flanged girder bridges may be designed with reinforced parapets and cross beams supporting the floor slab. This is an excellent method to employ, since headroom is economised and the parapets are employed to the greatest advantage. They may also be designed with reinforced main and cross beams below the decking when there is sufficient headway, the parapets being formed, in this case, of reinforced concrete or other material independent of the parts supporting the structure.

Fig. 3 is an example of the first type, the parapets being reinforced near the upper and lower surface throughout the longer span, where the area of concrete in compression was found to be too little to resist the compressive stresses. For the side spans, the parapets were only reinforced along the bottom, one series of rods being used at the top, round which the vertical shearing reinforcements were passed to form a secure attachment to the concrete near the upper surface.

The Concrete Mouldings

on the elevation of the parapets were formed for ornamental purposes, and the appearance of the bridge was thereby much improved.

The cross beams supporting the decking have reinforcements near the lower surface and a series of small bars along the top, over which the vertical shearing reinforcements are passed.

The decking is reinforced with longitudinal and transverse rods near the lower surface.

A Bridge of the Second Type

is shown by Fig. 4. In this case a series of main beams may be employed connected by cross beams of small span. In the bridge shown in the illustration the cross-beams were only placed under the roadway, there being none under the footways. The outside series of cross-beams shown on the plan are merely supports for gas and water pipes, &c., their purpose being more clearly shown in the cross-section.

The beams are reinforced near the upper and lower surfaces, since their depth is insufficient to give enough sectional area of concrete in compression to resist the stresses. The lower rods are tied to the upper surface by vertical shearing reinforcements. The parapets and string-courses are of terracotta, and are supported by a projecting ledge of reinforced concrete carried on reinforced corbels. The decking is reinforced by alternate straight and bent-up rods in the direction of the cross beams, a further set of straight rods in the direction of the main beams being inserted near the upper surface.

The two methods described above illustrate in a general manner the design of bridges supported by girders with parallel flanges, but these are necessarily altered in detail to suit every case.

(*To be concluded.*)

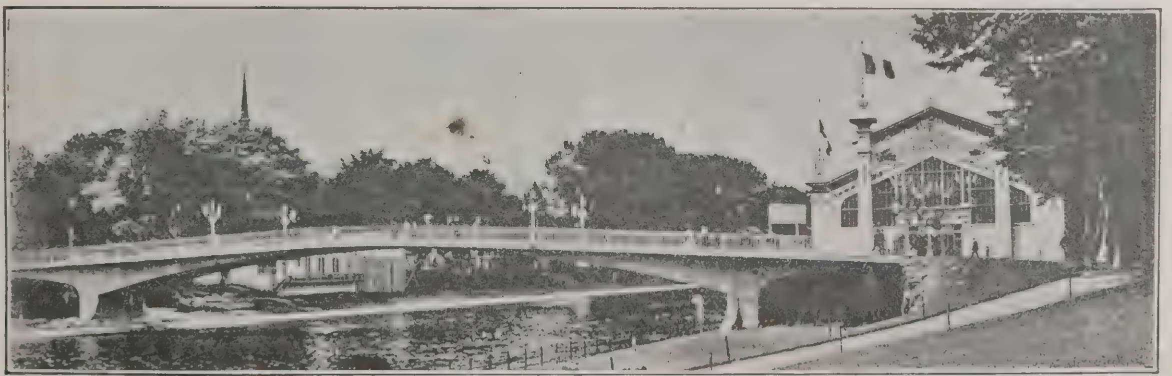


FIG. 2.—PONT HENNEBIQUE, LIEGE INTERNATIONAL EXHIBITION, 1905.

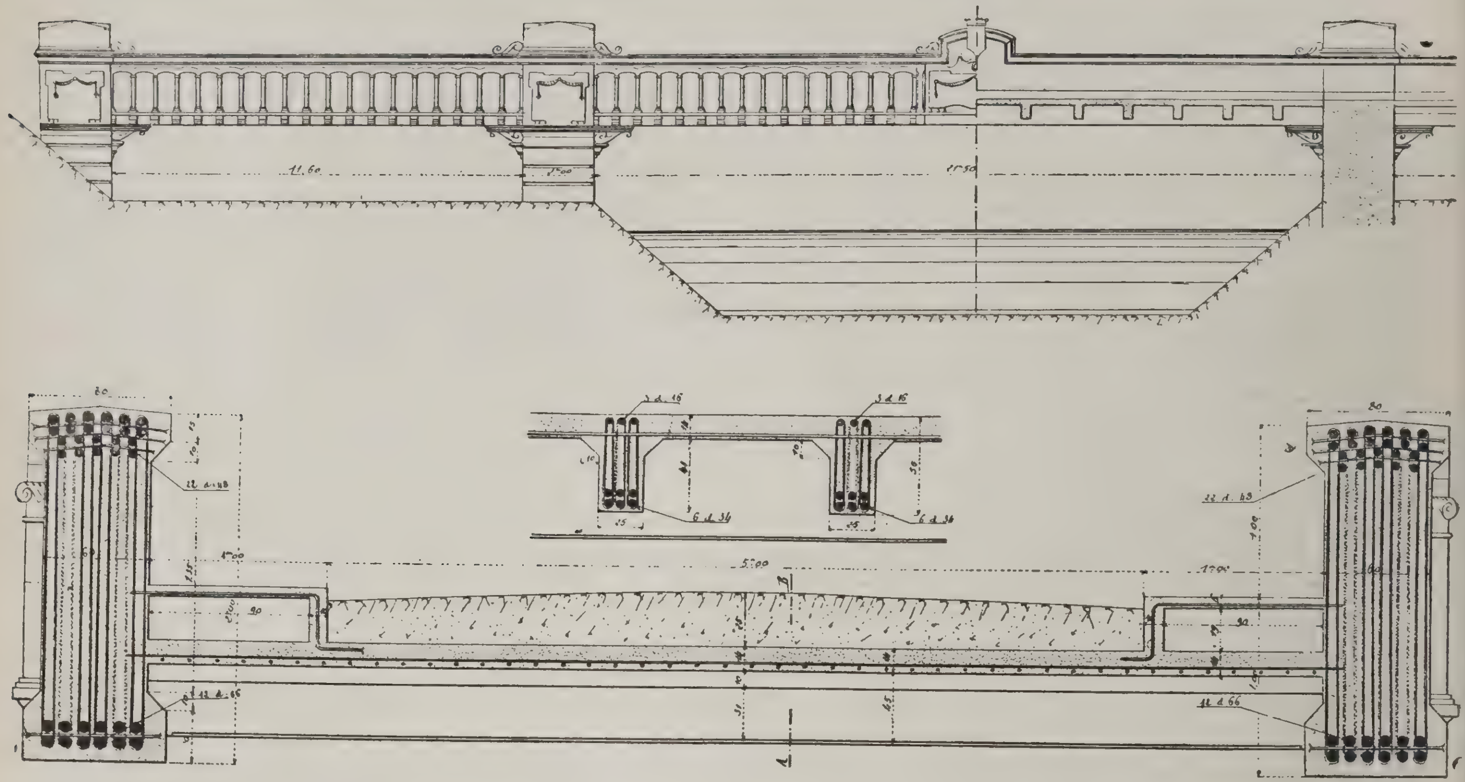
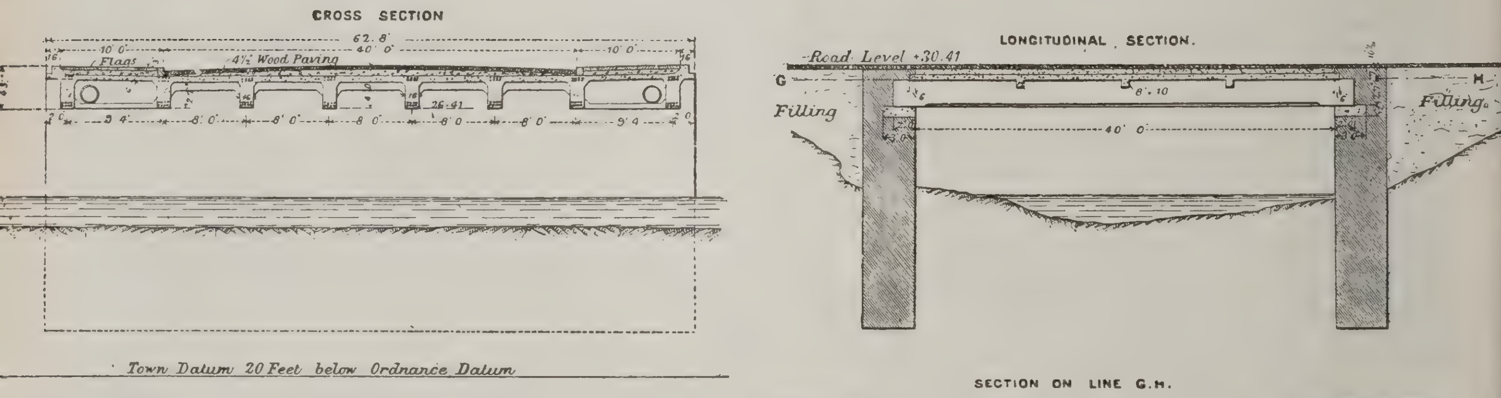


FIG. 3.


CROSS SECTION

LONGITUDINAL SECTION.

SECTION ON LINE G.H.

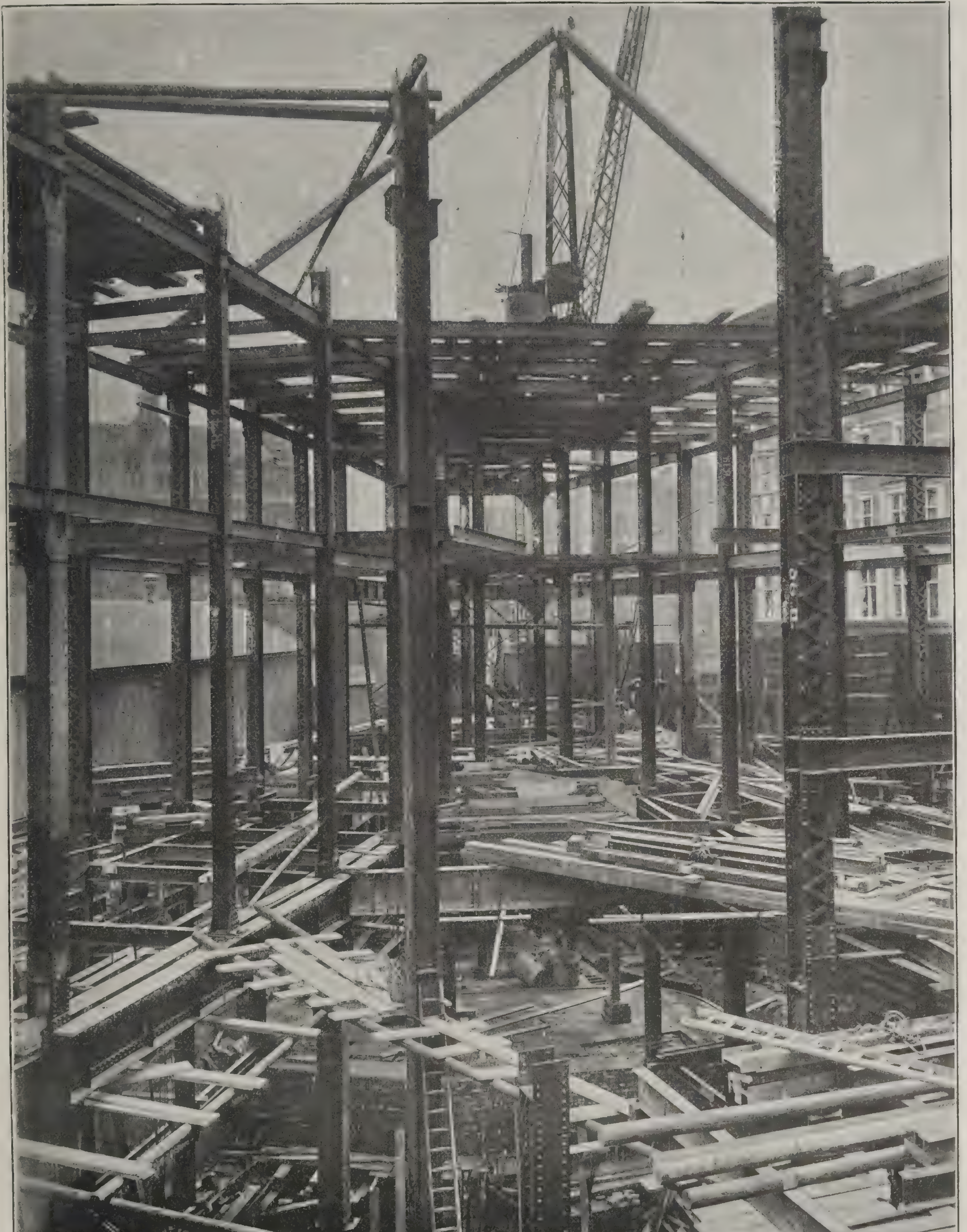
FLOOR SECTION ON LINE K.L.

SECONDARY BEAM

SECONDARY BEAM

CROSS SECTION THROUGH FOOTWAY.

FIG. 4.



STEELWORK AT THE NEW "MORNING POST" BUILDING, LONDON. MEWES AND DAVIS, ARCHITECTS.

In former issues of this supplement we have published photographs showing the steelwork in course of erection at the new "Morning Post" building, at the Strand corner of Aldwych. We now supplement these with the above view, taken on Friday last, which shows the present condition of the work. This photograph was taken from the back of the site, looking towards the Strand. It will be recollected that the plan of the building is triangular, with the point of the triangle against the Strand frontage. The placing of the stanchions has been carefully worked out for easy erection, and it is obvious from the above view how this makes for economy and quick work. A detail view of the curved girders at the corner was published in our last supplement (June 20th).

STRESSES IN REINFORCED CONCRETE BEAMS.—III.

(*Continued from p. 28, No. 593.*)

T Beams.

WHEN spans are small reinforced concrete floors are constructed of even thickness, as simple beams or slabs supported at the ends or on all four sides as a panel. Where, however, wide spans are required, intermediate beams are called for as supports, it becoming obviously undesirable and uneconomical to increase the thickness to such an extent that the floor slab would be self-supporting. These beams are generally constructed monolithic with the floor slabs, and the former are assumed to be strengthened by the latter by forming with them **T**-shaped beams. The concrete of the floor slabs is itself calculated to take the maximum compression at the centre of their spans, and thus we cannot add an additional stress by expecting it to take the compression that would come from their acting as the top or table of the **T**. Towards the supports however, the concrete of the floor slabs is not stressed to the full, and may be relied upon to take the stresses due to their acting as part of the **T**-shaped beams. It is usual to reckon one-quarter of each floor slab as forming a portion of the **T**, as shown in Fig. 9 where B is the breadth of the **T**.

In this present article we shall use the same symbols as in the first article of this series in our issue for May 23, with a few additions, namely:

b = breadth of rib of **T** beam.
B = breadth of table of **T** beam.
d = depth of tensile reinforcement from top of beam.
D = depth or thickness of table of **T** beam.
y = distance from top of beam to neutral axis.
$d - y$ = distance from tensile reinforcement to neutral axis.
a = area of steel in tension.
E_s = modulus of elasticity of steel = 30,000,000.
E_c = modulus of elasticity of concrete = 3,000,000.
S_c = greatest stress in concrete in compression.
S_s = greatest stress in steel in tension.

If the neutral axis does not fall without the floor slab or below the table of the **T** the method of calculation given in the first article of this series exactly applies, it being only necessary to substitute B for b.

If, however, the neutral axis falls below the table of the **T** then we have to somewhat modify our previous calculations.

Fig. 10 shows a longitudinal section comparable with Fig. 3, while Fig. 11 is the adaptation of Fig. 4 to the altered case, the volume of the shaded portion showing the amount of compressive stress taken by the various portions of the beam. For the sake of simplicity we may neglect the small amount of compression taken by the rib of the **T** above the neutral axis just as we have previously neglected the amount of tension taken by the concrete below the neutral axis.

We see by Fig. 10, from the properties of similar triangles, that

$$S_c : x :: y : y - D.$$

$$\therefore \frac{S_c}{x} = \frac{y}{y - D}$$

$$\text{or } x = \frac{S_c(y - D)}{y} \quad \ldots\ldots \quad (18)$$

Equation (1) remains the same for this case,

$$i.e. \quad S_s = S_c \cdot \frac{E_s}{E_c} \cdot \frac{d - y}{y} \quad \ldots\ldots\ldots (1)$$

Equation (5) however requires modification to suit the altered conditions. Instead of $S_c \cdot \frac{by}{2}$ representing the contents of the shaded portion, we get $(S_c + x) . \frac{DB}{2}$

The equation therefore becomes

$$(S_c + x) . \frac{DB}{2} = S_s . a \quad \ldots\ldots\ldots (19).$$

Inserting the value for x in equation (18) and the value for S_s in equation (1) in equation (19) we obtain.

$$\left[S_c + \frac{S_c(y - D)}{y}\right]\frac{D.B}{2} = S_c \cdot \frac{E_s}{E_c} . \frac{d - y}{y} . a$$

$$\therefore S_c \cdot \frac{(2y - D)}{y} . \frac{D.B}{2} = S_c \cdot \frac{E_s}{E_c} . \frac{d - y}{y} . a$$

$$\therefore (2y - D) . \frac{D.B}{2} = \frac{E_s}{E_c} . (d - y) . a$$

$$\therefore yBD - \frac{BD^2}{2} = \frac{E_s}{E_c} \cdot ad - \frac{E_s}{E_c} \cdot ay$$

$$\therefore y\left(BD + \frac{E_s}{E_c} \cdot a\right) = \frac{BD^2}{2} + \frac{E_s}{E_c} \cdot ad$$

$$\therefore y = \frac{\frac{BD^2}{2} + \frac{E_s}{E_c} \cdot ad}{BD + \frac{E_s}{E_c} \cdot a} \quad \ldots\ldots\ldots (20)$$

To obtain the moment of resistance M_r we require to know where the line of resultant of the compressive stresses is situated. This passes through the centre of gravity of the shaded parallelogram in Fig. 10 which is situated $\frac{D}{3} . \frac{S_c + 2x}{S_c + x}$ from the top of the beam. Inserting the value of x from equation (18) this becomes

$$\frac{D}{3} . \frac{S_c + 2\frac{S_c(y - D)}{y}}{S_c + S_c\frac{(y - D)}{y}} = \frac{D}{3} . \frac{3y - 2D}{2y - D} = \frac{3Dy - 2D^2}{6y - 3D}$$

The moment of resistance is therefore

$$M_r = R_s\left[d - \frac{3Dy - 2D^2}{6y - 3D}\right] \quad . . . (21)$$

And as $R_s = S_s . a.$, by substituting the value of $S_s . a.$ in equation (19) we get

$$M_r = (S_c + x) . \frac{DB}{2}\left[d - \frac{3Dy - 2D^2}{6y - 3D}\right].$$

Substituting the value of x in equation (18) we get

$$M_r = \frac{S_c.(2y - D)}{y} . \frac{DB}{2}\left[d - \frac{3Dy - 2D^2}{6y - 3D}\right] . (22)$$

These equations give us all we require for designing because we have B, D, the load and bending moment (equal to the moment of resistance) all fixed. Thus taking, as before, $\frac{E_s}{E_c} = 10$, and the highest stresses concrete and steel will bear, and putting $y = zd$ we get:

From equation (1)

$$60{,}000 = 3{,}000 . 10 . \frac{d - zd}{zd}$$

$$\therefore 2z = 1 - z \quad \therefore z = \tfrac{1}{3} \text{ and } y = \tfrac{1}{3}d.$$

From equation (22)

$$M_r = \frac{3000(\frac{2}{3}d - D)}{\frac{1}{3}d} . \frac{DB}{2}\left[d - \frac{Dd - 2d^2}{2d - 3D}\right]$$

in which only d is unknown.

Having found d in this way, we can calculate a from equation (20) which becomes

$$\tfrac{1}{3}d = \frac{\frac{BD^2}{2} + 10ad}{BD + 10a.}$$

The breadth, b, of the rib, has to be sufficient to resist the shearing stresses, and therefore may be omitted for the present.

(To be continued.)

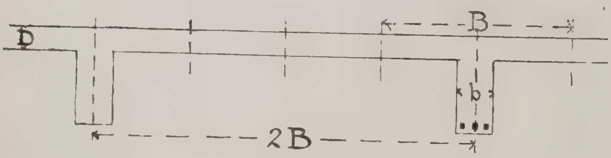


FIG. 9.

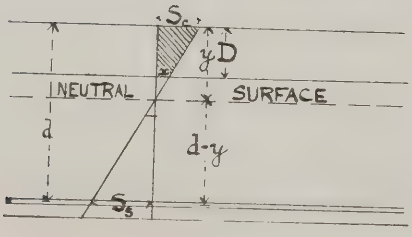


FIG. 10.

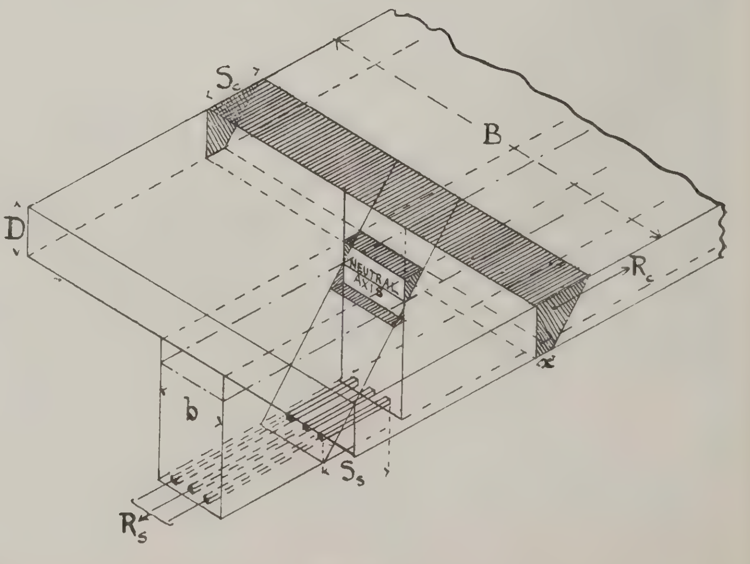
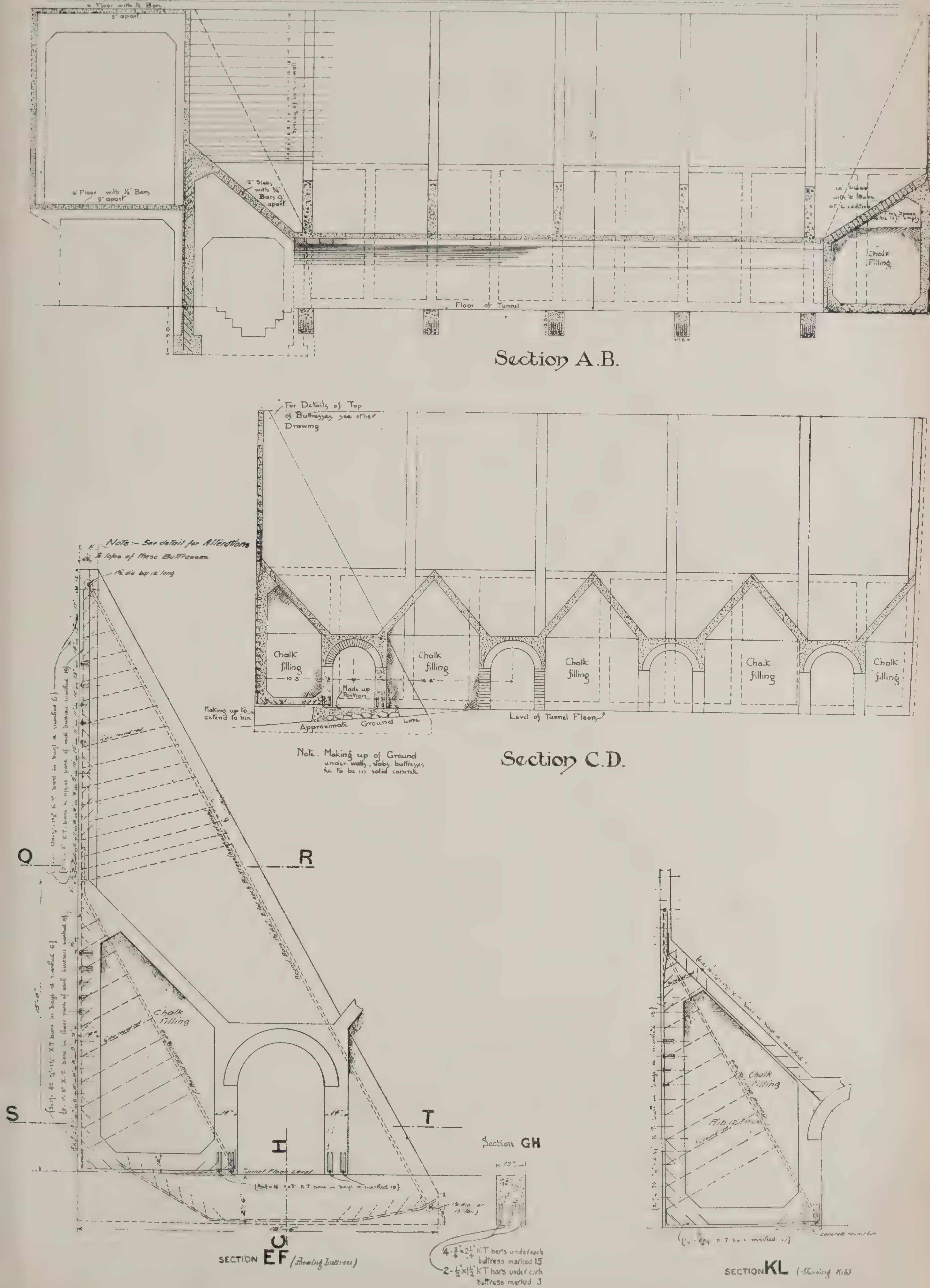
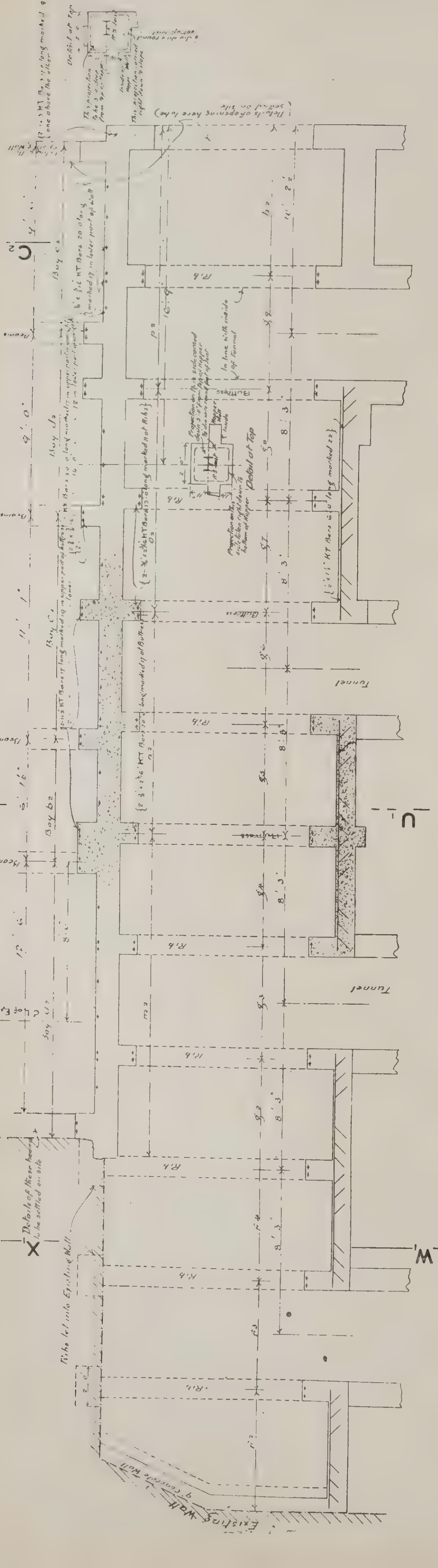


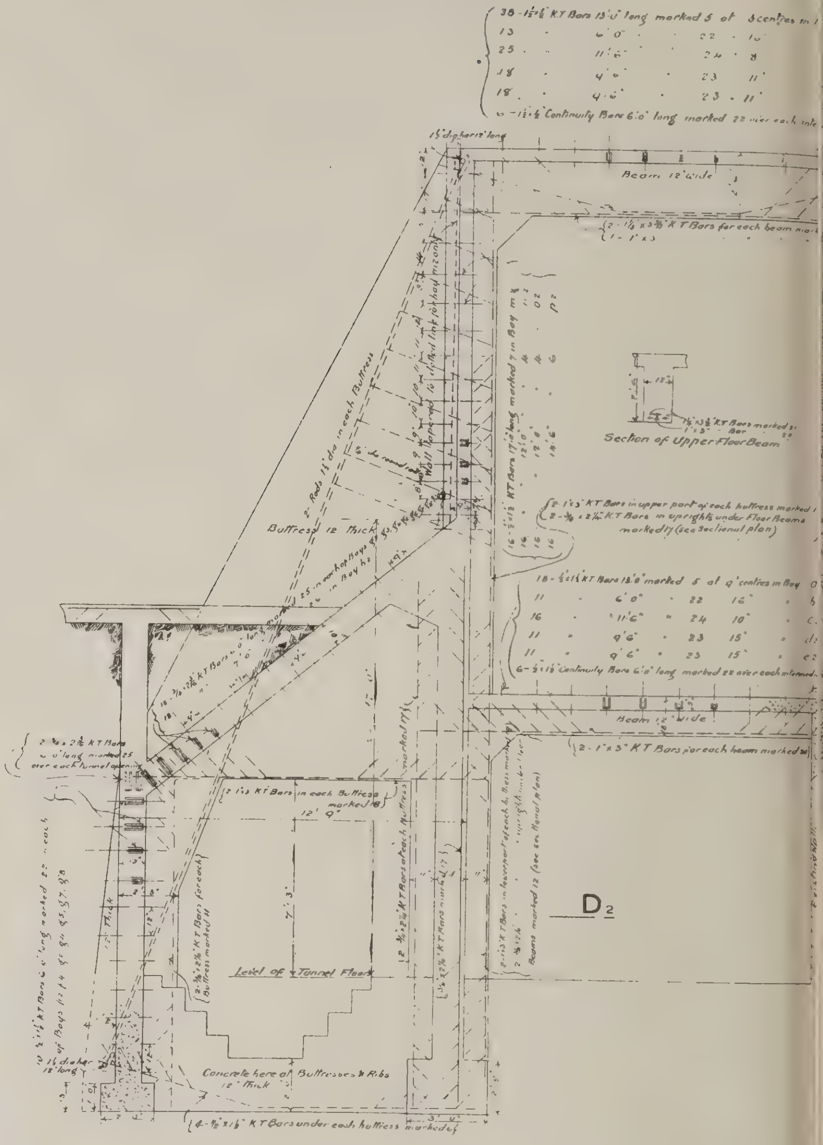
FIG. 11.


6" Floor with ½" Bars 5" apart
6' Floor with ½" Bars 9" apart
12" Slabs with ¾" Bars 9" apart
Spacing of bars in wall
12" Slabs with ¾" Bars at 6" centres
This Space to be left empty
Chalk Filling
Floor of Tunnel
Section A.B.
For Details of Top of Buttresses see other Drawing
Chalk filling
Made up Portion
Making up to extend to here
Approximate Ground Line
Level of Tunnel Floor
Note. Making up of Ground under walls, slabs, buttresses &c to be in solid concrete.
Section C.D.
Note:- See detail for Alterations to tops of these Buttresses
1½" dia bar 12' long
Q
R
S
T
H
Chalk Filling
Tunnel Floor Level
Section GH
4-¾"×2¼" KT bars under each buttress marked 15
2-½"×1½" KT bars under each buttress marked 3
SECTION EF (Showing Buttress)
Chalk Filling
Rib 12"
SECTION KL (Showing Rib)

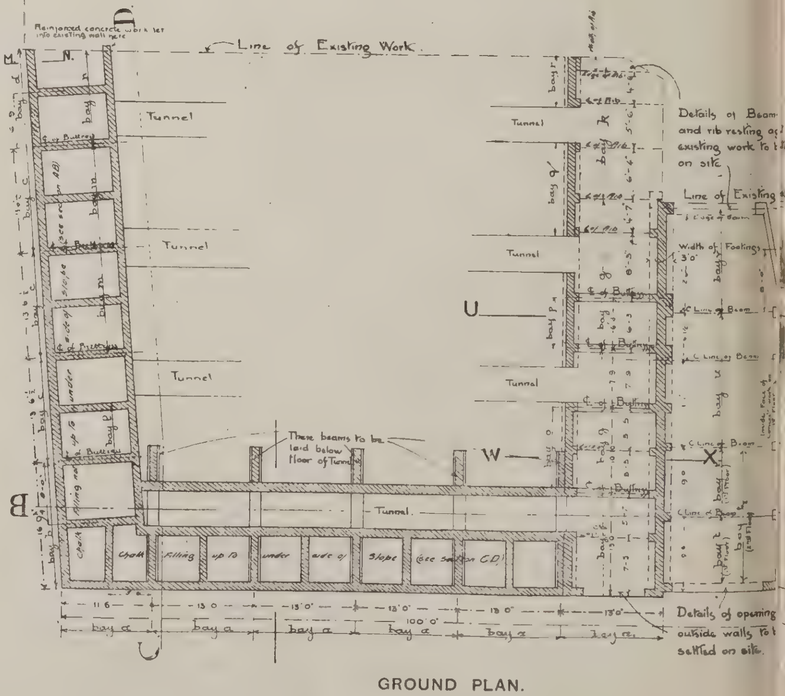
WORKING DRAWINGS OF COAL POCKET AT BEVAN'S PORTLAND CEMENT WORKS, GRAVESEND.


C₂
V₁
U₁
W
X
Bay b₂
Bay c₂
Bay d₂
Beams
Rib
Tunnel
Buttress
Detail at Top
In line with inside of tunnel
Details of these beams to be settled on site
Ribs let into Existing Wall
Existing Wall

SECTIONAL PLAN THROUGH C₂ D₂

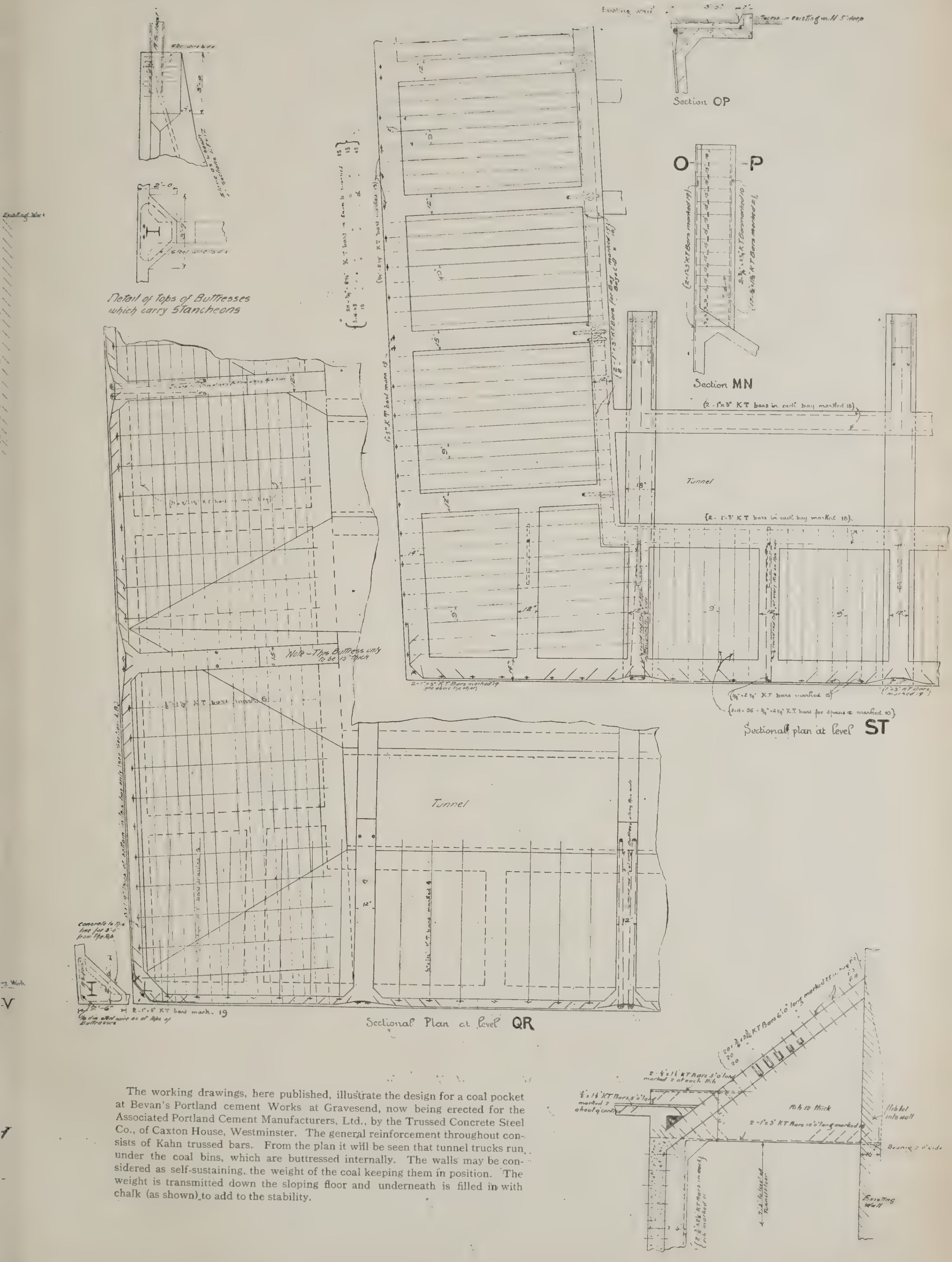

Beam 12" wide
Section of Upper Floor Beam
Buttress 12" Thick
Level of Tunnel Floor
Concrete here of Buttresses & Ribs 12" Thick
D₂

SECTION U₁–V₁ (SHOWING BUTTRESS)


D
B
U
W
X
Line of Existing Work
Tunnel
These beams to be laid below floor of Tunnel
Chalk filling up to underside of slope (see section C.D.)
bay a
100' 0"
Details of Beam and rib resting on existing work to be settled on site
Line of Existing
Width of Footings 3' 0"
Details of opening outside walls to be settled on site.

GROUND PLAN.

WORKING DRAWINGS OF COAL POCKET AT


Detail of Tops of Buttresses which carry Stancheons
Existing wall
Recess in existing wall 5" deep
Section OP
O
P
(2-1×3" K T Bars marked 19)
Section MN
(2-1"×3" K T bars in each bay marked 18)
Tunnel
(2-1"×3" K T bars in each bay marked 18)
Note - This Buttress only to be 15" thick
2-1"×3" K T Bars marked 19 one above the other
Sectional plan at level ST
Tunnel
Concrete to this line for 3'-0" from the Rib
2-1"×3" K T bars mark. 19
Sectional Plan at level QR
2-1"×1" K T Bars 5'0" long marked 2 at each Rib
Rib 12" thick
2-1"×3" K T Bars 10'0" long marked 19
Rib let into wall
Bearing 2" wide
Existing Wall
SECTION W, X, (showing Rib supported by existing wall)

The working drawings, here published, illustrate the design for a coal pocket at Bevan's Portland cement Works at Gravesend, now being erected for the Associated Portland Cement Manufacturers, Ltd., by the Trussed Concrete Steel Co., of Caxton House, Westminster. The general reinforcement throughout consists of Kahn trussed bars. From the plan it will be seen that tunnel trucks run under the coal bins, which are buttressed internally. The walls may be considered as self-sustaining, the weight of the coal keeping them in position. The weight is transmitted down the sloping floor and underneath is filled in with chalk (as shown) to add to the stability.

PORTLAND CEMENT WORKS AT GRAVESEND.

FERRO-CONCRETE CONSTRUCTION.*

By Henry Adams, M.Inst.C.E.

So much has been written during the last four or five years upon the use of concrete and steel in combination that there is practically nothing new to be said. Those who have studied the literature of the subject will probably have been struck with the number of different terms used to express this mode of construction. "Béton armé," and the English equivalent, "armoured concrete," are perhaps the least appropriate. "Reinforced concrete" gives undue prominence to one element to the total exclusion of the other; "concrete-steel" is less open to objection, but the writer prefers the term "ferro-concrete" as being self-explanatory of the intimate combination between the two materials, the more important one coming first. A superficial criticism might allege that *ferrum* is iron, and therefore not applicable to steel, but steel is generically iron, and the term is therefore quite appropriate.

In early designs no provision whatever was made to resist the shearing stresses, which were either overlooked or ignored, and it is interesting to observe the gradual recognition these stresses obtained in the hands of the designers, until in recent construction they receive nearly as much consideration as what are called the "direct" stresses of tension and compression. The importance of considering shear was brought prominently under notice by the failure of experimental beams which had no special provision for meeting the shear stress towards the ends, where, of course, it is greatest. Various methods are employed in the different systems, but the Kahn trussed bar seems peculiarly suitable, the fin on either side of the core being left attached throughout the middle portion where the tension is greatest, and separated and bent upwards towards the ends to take the shear where the tension is least.

The question of adhesion between the concrete and the steel at one time caused some anxiety. It was naturally supposed that with increase of temperature the steel would expand more than the concrete, and it was thought that this would be sufficient to impair, if not to destroy, any adhesion that might be otherwise obtainable. As a matter of fact the linear change for a given variation of temperature is about 15 per cent. less for concrete than for steel, but when the actual figures are compared the difference is very trifling. Taking the range of temperature between summer and winter as seventy degrees Fahrenheit, the change of length in 100ft. produced by this variation of temperature will be for steel 0·546in. and for concrete 0·464in. the difference between the two materials in a length of one foot being less than a thousandth of an inch.

With equal care in mixing the concrete the adhesion varies with the condition of the surface of the steel. When coated with red oxide paint it is extremely slight, and even a bituminous paint reduces the adhesion below that due to a clean unprepared surface. It is, however, found that the best adhesion occurs when the steel is rusted all over before being embedded in the concrete. This appears to be due to the formation of some chemical compound, or salt of iron and lime, which may not be detrimental in the absence of further moisture, but the final result is doubtful in such cases as reservoir walls, tanks, and dams. Painting the steelwork over with cement wash is a simple method of commencing the contact, and this would seem to prevent further rusting, on the principle of the pail of limewater into which the Sheffield grinders dip their small goods to resist the tendency to rust when left wet.

Professor Bauschinger found the ultimate adhesion to be from 569 to 668lb. per sq. in., but Mr. J. S. Costigan found it not to exceed 65lb. per sq. in. Probably in the former case it was measured by the resistance of a rod to withdrawal, and in the latter by the insertion of small plates in a briquette. At any rate it is not safe to reckon upon more than 50lb. per sq. in. as a working load for adhesion. Allowing 16,000lb. per sq. in. as the working load on steel, the embedded length that would make the strength and adhesion equal would be 16,000 times the sectional area of steel in square inches divided by fifty times the surface area per inch in length, or briefly $320\ a \div s$; so that a quarter-inch square bar embedded for a length of twenty inches would be equally strong against tearing or slipping, and similarly a one-inch square bar would need to be embedded for a length of eighty inches. There are many different constructions in which this fact may be of importance; for instance, in a simple beam, if the span is less than twice the above lengths, there will be a tendency for the rod to draw before the tensile strength is utilised, unless the ends are turned up to form cleats. In the edge of a circular ferro-concrete tank, instead of overlapping the ends of the rods, for which the above distance would be a minimum, it would clearly be more economical to turn up the ends and slip a welded link over them. There are several specially prepared bars giving greater resistance to withdrawal—*e.g.*, the Ransome twisted bar, the square corrugated bar, and the Columbian bar, which relies for efficiency upon its large surface area compared with its sectional area, but plain rods which can be obtained everywhere should be adopted whenever possible, on the score of economy and avoidance of delay.

Ferro-concrete does not at first sight lend itself readily to architectural effect; the warehouses and coal stores constructed of it can hardly be called visions of beauty, but some of the recent arched bridges have a decidedly pleasing effect, and when the adaptability of the compound material becomes better known we may confidently look forward to the expression of taste as well as utility in the designs.

Perhaps the greatest departure from existing models occurs in the construction of ferro-concrete retaining walls. Hitherto we have looked upon weight as the essential element of such walls, and stability has been secured by leaning this weight against the bank of earth to be supported. We are now confronted with a new type in which added weight bears no part; the only weight employed is that of the earth itself. The construction consists of a skin of concrete reinforced with steel rods, securely and continuously attached to a similar base and forming with it two sides of a triangle. The face wall is then kept in position by rods protected by concrete, tying the inner edge of the base at intervals to the face at one or more points of the height. It does not follow that because the centre of effort of the thrust occurs at one-third of the height that that is the proper place for the connection to be made; it would be if the wall were disconnected at the bottom, but being firmly secured there the point of attachment should certainly be higher than one-third. If the stiffness throughout the height be uniform the point of attachment should be about 58 per cent. of the height. There are some other rather nice points of calculation about these walls which the writer does not propose to go into now; he would only point out that, apart from strength, the stability is obtained by the weight of earth resting on the base. Other examples of these walls have reinforced counterforts six to nine inches thick extending to the whole height at intervals of eight to ten feet, in the length, and others again have reinforced buttresses at similar intervals, and in one case the writer has seen the base of the wall extended in the front instead of at the back, so as to react by pressure at a considerable leverage, but this method does not appear to be so economical as that previously described.

There are, no doubt, many other uses to which ferro-concrete systems may be applied. Englishmen are naturally conservative; they like to feel that in their adoption of any new system they are not running too great a risk, and a novel form of construction such as this must undoubtedly have some failures, but, paraphrasing the old saying, the writer would urge that "nothing succeeds like failure." It is from failures that the greatest knowledge of true principles can be obtained, and therefore we should be grateful to those pioneers who do venture to take risk, even at the sacrifice of some reputation.

REINFORCED CONCRETE.*

Its Relation to Fire Protection.

By E. P. Goodrich, M.Am.Soc.C.E.

In choosing the subject of "Reinforced Concrete and its Relation to Fire Protection," the writer had in mind the dual conditions necessary to the greatest immunity from fire in large building constructions, particularly where such has varied types of occupancy, together with correspondingly different manufacturing fire hazards.

The requisites are, first, the employment of the most incombustible materials and the assembling of these elements in such manner as will most effectively limit the spread of fire; secondly, the equipment of the building with such protective and extinguishing apparatus as a wide experience has determined most effective. Either of these essentials alone will accomplish a large measure of results, but to secure a maximum the combination is necessary.

An exemplification of such a combination is the tenant factory community being developed by the Bush Terminal Company of Brooklyn, N.Y., U.S.A., for which reinforced concrete has been adopted as the structural part of all buildings. These factories were especially designed to take advantage of all insurance regulations, and thus secure the minimum insurance rates on buildings and contents.

Associations of insurance companies in the United States have had the effect of standardising requirements. All the most important points thus developed were carefully considered in the design of the Bush Factories, which thus were provided with:

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* Summary of a paper read before the Seventh International Congress of Architects on July 17.

* Summary of papers read before the Seventh International Congress of Architects on July 17.

Special fire walls.
Special stair and elevator shafts.
Waterproof floors.
Automatic fire doors.
A complete sprinkler equipment.
Windows of wire glass in metal frames.

The reinforced concrete design was prepared with special care as to the fire-resisting qualities of the structure. A "unit" system of reinforcement was devised, which proved effective and economical, not liable to derangement during construction, and especially advantageous because allowing of the use of special fire-resisting materials at points of greatest danger. The columns, even though built of concrete, were fire-proofed with cinder concrete shells, which served at the same time as a vehicle for the steel reinforcement and as a mould for the construction of the main body of the column.

The building now completed enjoys the lowest rate of fire insurance, both as to structure and contents, accorded any similar risk.

CONSTRUCTION AND ÆSTHETICS.

By Professor Louis Clouquet.

[On behalf of the Central Society of Architecture of Belgium.]

Constructive Point of View.

This old style edifice was characterised by the separation between two distinct parts, the walls and the gable. There is a lack of solidarity between the two. At the point where the trusses of the frame rest upon the walls there is something like an articulation. The introduction of the metallic frames has not at once remedied this characteristic defect of buildings formed of stone walls and gables of wood. For a long time it was customary to combine trusses of iron similar to the wooden trusses. The solution of the problem of the large halls only made a decisive step in advance when the centred trusses were introduced, which have their starting point on the ground, like the trusses of the Dion pattern. From that moment the solidity between the vertical and the inclined parts was secured. However, it is only the trusses which cannot be deformed. The solidity between the vertical and the inclined parts is not realised in the enclosing surfaces. There is lack of homogeneity between the two parts of the building—that is to say, its skeleton or frame and its wall. Logic claims a more radical solution, which would consist in establishing solidity not only between the uprights and the trusses, but rather between the wall and the roof. This is what the use of reinforced concrete enables us to realise. The side wall may even disappear or be made one with a vault. The whole will show almost uninterrupted surfaces on the outside as well as on the inside, with the absence of the encumbering internal protrudings of the frames. The new arrangement has, therefore, as a result to save the trusses, and only to maintain a surrounding wall which supports itself without any assistance. Now, experience has shown that buildings conceived on this plan do not cost more than those carried out in thick stone walls with metallic gables, and that they are solid.

If it is the question of a building with storeys the floor of reinforced concrete takes with advantage the place of the old systems. The most characteristic consequence of the use of reinforced concrete is the supression of the roof, as the uppermost ceiling can be used as a cover and constitute an inhabitable terrace. This kind of construction lends itself, moreover, to the boldest rakes or overhanging structures.

This system, if applied in a rational manner, is able to bring a change into the architectural forms. It simplifies the forms, it causes the cumbersome complexities of the frames and floorings to disappear, it simply carries out all the surrounding or separating surfaces. It makes disappear every distinction between the wall and the roof. It introduces an architecture consisting of such elastic surrounding walls that these can be given any dimensions required, according to the space it is useful to enclose. The compartments will take the shapes of parallelopipeds terminated by terraces, and the large buildings with curved vaults with visible estrades. We must be prepared to see sculptures and moulded relief work disappear and coloured ornaments prevail. A radical change in the internal and external forms of the buildings will be the consequence of the substitution of a concrete solid, homogeneous structure for our former architectonic organism. All the forms proper for a combination of marked out stones and covered over with plaster, which will henceforth no longer be used, would here be devoid of expression and æsthetic value. They must be given up and other methods must be found.

The Æsthetic Point of View.

We have in mind three kinds of form: those of *convenience*, those of *structure*, and those of *expression*.

The forms of convenience, by which the building receives its complete usefulness and a character in harmony with its destination, satisfies the mind without causing pleasure to the eye. Those forms of convenience which are, if not the most pleasing, at least the most excellent can be carried out to perfection by making use of the processes, so eminently practical, of reinforced concrete.

The forms of expression are those by which the architect and his assistants put their imagination and their soul into the building, in order to impart to it the eloquence of a pleasant aspect. The ideal is that they shall form an integral and inseparable part of the structures. In the buildings constructed of reinforced concrete there is little scope for the artist's talent, especially the sculptor's. There remains hardly anything except the superficial decoration by painting and some polychromic, ceramic, or other adornments, but for the artists in colour a vast field is opened for their creations.

The forms of structure, either real or fictitious, are the principal ornament of the buildings produced by the old methods. They are those organic forms which give life to the aspect of buildings with walls of marked out stones.

In the old-fashioned conception a building is to be compared with a living organism where we can distinguish a skeleton, various members, and a sort of muscular system. Reinforced concrete does not afford these elements of interest and charm; it leaves the impression that the work has been carried out in too docile a material, on which the sacred labour of the workman and his traditional processes have not left the traces of the noble struggle between the artisan and matter. We do not find the same beauty in this work all cast in one block in a dead and dull-coloured material, without apparatus, without organism, with which the best thing that can be done is to hide them beneath a superficial decoration.

In conclusion the new processes, economic and powerful as they are, are precious from the point of view of certain bold and complex accomplishments. They are devoid of the charm of an artistic expression. Besides, economy is only a relative law and of a secondary character, and the boldness of the structure is not always required. A process which is prevalent from these two points of view does not impose itself to the exclusion of the others. Recourse may be had to it for the economic satisfaction of ultilitarian projects, for the realisation of comfort, and for the solution of bold problems. But it will eliminate from architectural practice the noble and artistic combinations of masonry work in marked-out stones, moulded and sculptured, of frameworks in wood and in metal, of superstructures with vaults, &c.

STEEL AND REINFORCED CONCRETE CONSTRUCTION.*

By Joaquin Bassegoda (Barcelona).

Building in reinforced concrete does not solve any new problem either in art or construction; it is a composite building of stone and metallic materials by means of which, profiting by the qualities of the two components, difficulties are more economically solved than could be done with either of them alone.

Economy in the use of reinforced concrete does not depend on the low price of the materials of which it is composed, which are comparatively dear, but on their accurate combination, which allows of the quantity being reduced. Economy consequently has a limit in the maximum co-efficient of ironwork and concrete.

There is no reason why these co-efficients, especially that of the concrete, should be higher than homogeneous constructions, for there are many circumstances, all difficult to foresee, which may produce lower resistances than those which have served as a basis in the calculation; such as the quality of the cement; the nature and size of the sand and gravel, and the manipulation and use of the different materials.

This consideration has produced various systems from which cement work has been almost completely eliminated, or in which at all events, it has not been taken into consideration in the calculation; it is then considered as a simple exterior covering destined to protect the metal against agents which would tend to destroy it, such as oxidation and fire.

Security reaches its maximum in these systems, but, on the other hand, economy diminishes; it may happen that this kind of masonry may become less economical than other homogeneous kinds, such, for example, as brick laid with cement.

In countries where they have excellent bricks which, according to an already old-established custom, they use in very reduced thicknesses, either in the parts which give support or in the parts which are supported (arches and horizontal floorings), one might introduce the system of fortifying these constructions, thus obtaining a greater ecomomy in homogeneous masonry work and in fortified concrete work.

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*. Summary of a paper read before the Seventh International Congress of Architects on July 17th.

In places where construction in brick does not meet the conditions required, the use of armoured cement offers a real and effective economy over all other systems of construction; an economy which should not be exaggerated whilst admitting coefficients of work very superior to those which experience found to be absolutely safe. One can recommend such systems in which the ironwork is adjusted to be able to resist all external force.

With regard to the artistic point of view of the question, reinforced concrete has no exclusive form; on the contrary, like every concretion, it takes that which is given to it. The supporting element, covering an empty space, may be straight (beam) or curved (arch): the length of the former is comparatively restricted; the length of the latter can be much extended, as is also the case in homogeneous constructions.

In the straight form, as in the curved, the theoretical limit of reinforced concrete requires, on account of the weight of the concrete itself, the use of a greater volume of iron in the ironwork than is required in homogeneous metallic constructions. The relation or proportion between the units of resistance and of weight is 13 times greater in cement than in iron. It follows that in proportion as the absolute dimensions of the works in reinforced concrete are increased, so must the importance of the iron over the cement be increased also, and in consequence the forms then have the characteristics of metallic constructions, as may be noticed in the large bridges.

On the other hand, in architectonic works, in which it is scarcely ever desired to attain the maximum of possible dimensions, the artistic character must come from the lines, projections, and coloration. With regard to the first, the architect can choose freely without any restriction; the second, whatever they may be—mouldings, ornamental decorations, &c.—can also be obtained with ease and comparative economy, but with the drawback that for their execution one must have recourse to moulding, which indicates a limitation of artistic effect to which architectonic art cannot bring itself. With regard to colour one cannot admit the only one, that of cement; but, on the contrary, this modern concrete must be treated as the ancients treated it—that is to say, by covering it either altogether or in part with other materials of which the varied coloration permits of obtaining the desired effect being obtained, as certain architects and engineers are already doing who have succeeded in using armoured cement in their works with a particularly artistic effect.

SHEAR STRESSES.

In Beams of Steel and of Reinforced Concrete.

By Prof. Robert H. Smith, A.M.I.C.E., M.I.M.E., M.I.E.E., &c.

(Continued from p. 27, No. 593.)

Approximate Solution.

As the phenomenon of the variation of shear stress in the neighbourhood of the junction between the two materials is somewhat complex, it will be illustrated by a simple case—namely, that of there being no steel in the upper part of the section above the neutral axis, and of the steel being confined to one horizontal row of bars embedded near the under surface of the beam.

In this case the distribution of stress over the whole upper part above the neutral axis is exactly similar to that in a plain homogeneous beam. Thus, if the section be full and rectangular, T and τ are simply proportioned to the height above neutral axis, and the curve of intensity of shear stress on the vertical section is a parabola rising from zero at the top surface and with its vertex at the neutral axis. The neutral axis, of course, lies low below the mid-depth of the section. Thus, with a rectangular outline to the section of total depth H, and a steel section of, say, $2\frac{1}{2}$ per cent. of the concrete section placed at $\frac{H}{10}$ from the bottom, and with steel elastic modulus 16 times that of the concrete ($e=16$), since $16\times{\cdot}025={\cdot}4$; the neutral axis lies above the under surface a distance $\frac{H}{2}\cdot\frac{1+16\times{\cdot}025\times2\times{\cdot}1}{1+16\times{\cdot}025}=\frac{H}{2}\cdot\frac{1{\cdot}08}{1{\cdot}4}={\cdot}39H$. If e were 20, this height would be $\frac{H}{2}\cdot\frac{1{\cdot}1}{1{\cdot}5}={\cdot}37H$. This proportionate height does not vary largely in practice so long as the steel is placed all near the bottom. As a further example, take the steel 3 per cent. of the whole rectangular section with its lower edge 4 per cent. of H from the bottom surface and $e = 20$. Then the neutral axis lies ·345H from the bottom and ·655 from the top. The moment of inertia of the section is then made up of the following four items, the section width being called B:—

All concrete above neutral axis	$\frac{{\cdot}655^3}{3}$	$= {\cdot}0937BH^3$.
All concrete below neutral axis and above steel	$\frac{{\cdot}275^3}{3}$	$= {\cdot}0069$,,
Steel - -	$20\times{\cdot}03\times{\cdot}29^2$	$= {\cdot}0504$,,
Concrete below steel	${\cdot}04\times{\cdot}325^2$	$= {\cdot}0042$,,
Total - -		$I = {\cdot}1552BH^3$.

A plain homogeneous rectangular section would have $I=\frac{1}{12}BH^3={\cdot}0833BH^3$.

The bending modulus for the extreme compressive stress in the concrete is $\frac{{\cdot}1552}{{\cdot}655}={\cdot}237BH^2$. That for the tensive stress in the concrete at the same level as the steel is $\frac{{\cdot}1552}{{\cdot}29}={\cdot}533BH^2$. That for the tensive stress in the steel is $\frac{{\cdot}533}{20}={\cdot}02665BH^2$. This tensive stress in the concrete is less than the extreme compressive stress in the ratio $\frac{29}{{\cdot}655}={\cdot}443$; and, therefore, the tensive stress in the steel is greater than the extreme compressive stress in the ratio $20\times{\cdot}443=8{\cdot}86$. If this extreme compressive stress be 600 lbs./in.², then the bending moment is

$$600\times{\cdot}237=142BH^2 \text{ inch-lbs.}$$

with B and H in inches.

The total compressive force upon the section above the neutral axis is $\frac{1}{2}\times600\times{\cdot}655BH$, or in general terms $\frac{T_m}{2}\times{\cdot}655BH$, if T_m be the extreme fibre compression, and $u\frac{I}{H}={\cdot}237BH^2$. Now, if F be the total shear force over the whole section it has been shown that the difference of T_m in two contiguous sections b apart is $T_m'b=\frac{Fb}{{\cdot}237BH^2}$. Therefore the difference of the two total compressive forces above the neutral axis on these two sections is $\frac{Fb\times{\cdot}655BH}{2\times{\cdot}237BH^2}=\frac{{\cdot}655}{2\times{\cdot}237}\frac{Fb}{H}$. This causes shear on the neutral axis surface $b\times B$, and the intensity of this shear is $\frac{{\cdot}655}{2\times{\cdot}237}\frac{F}{BH}=1{\cdot}38\frac{F}{BH}=1{\cdot}38\bar{S}$, if $\bar{S}$ be the average shear stress over the whole section. If the depth of the neutral axis below the upper surface be called $cH={\cdot}655H$ in this special case, then the factor $1{\cdot}38$ is $\frac{c^2}{2i}$, where i is the coefficient in $I=iBH^3$. For a full homogeneous rectangular section, the ratio of maximum shear stress at neutral axis to average shear stress is well known to be $1\frac{1}{2}$: here $c=\frac{1}{2}$ and $i=\frac{1}{12}$, and $\frac{12}{2\times4}=1\frac{1}{2}$. For the reinforced concrete beam here taken as an example, it is reduced from $1\frac{1}{2}$ to $1\frac{3}{8}$.

For any other sectional shape than the rectangular, all we have to do is to compute $T_m'b=\frac{cFb}{iBH^2}$; from this find the difference of the two total thrusts above neutral axis, and divide by bB_n, where B_n is the breadth of the section at the neutral axis. The small distance b of the sections apart, of course, cancels in the division and there, remains as the shear stress at neutral axis a definite numerical factor (depending on the sectional shape) multiplied by $\frac{F}{B_n H}$. The ratio of $B_n H$ to the whole sectional area being known, this gives the ratio of this neutral axis shear to the average shear over the total section.

Proceeding now downwards to a horizontal section j, the steel, say at $\frac{{\cdot}655}{2}H$, below neutral axis in the example here taken, here the tensive stress is half the compressive stress at the upper surface, and the total pull between this level and the neutral axis is $\frac{1}{4}$ of the total thrust above this axis. This applies to both vertical sections b apart, and on each above the section considered up to the top there is an excess of thrust over pull equal to $\frac{3}{4}$ the total thrust. The same proportion applies to the difference of this excess on the two vertical sections, and (the section being of uniform width) the shear stress on horizontal and vertical sections at this level is $\frac{3}{4}$ of its intensity at the neutral axis. Down to the close neighbourhood of the steel it decreases from its maximum intensity at neutral axis according to the same law that would hold for a rectangular homogeneous section of depth $2\times{\cdot}655H=1{\cdot}31H$.

At the level of the steel, since the steel is stretched horizontally in the same ratio as the concrete at the same level, and is therefore stressed e times as much as the concrete, the rate of variation per inch horizontal of the steel-stress is e times that of the concrete. That is, T''_h is e times greater in steel than in contiguous concrete at same level. But we found that the variation of shear per inch vertical $S''_v = T''_h$ in each material; so that apparently the shear in the steel must vary vertically twenty times more rapidly than it does in the concrete. Thus if S be the shear stress in the concrete immediately above the steel and in contact with it, and if there were the same shear in the steel at this level, and if S_2 were the shear in the concrete immediately below and in contact with the steel, the variation in the concrete being (S_1-S_2), that in the steel would be $20\ (S_1-S_2)$, and the shear in the lower side of the steel would be $S_1 - 20\ (S_1 - S_2) = (20S_2 - 19S_1)$, and this would be less than that in the contiguous concrete by a difference of $S_2 - (20S_2 - 19S_1) = 19\ (S_1 - S_2)$. Is such a difference possible? Although discontinuity of shear strain is possible, and indeed inevitable, at the dividing surfaces between the materials, as also discontinuity of rates of variation of stress, there is no physical possibility of discontinuity of the shear stress itself. Even if there were shear fracture at these surfaces, and the one material actually slid over the other, the shear at each of the two touching surfaces would be the friction resisting such sliding, and would therefore be equal on each.

A part answer to this paradox is that in Fig. 2 there were considered the stresses on only two of the three sets of parallel sides of the prism $a \times b \times 1$. In most elastic problems the stresses on the planes parallel to the main forces are either zero because of symmetry of condition or are too small to need to be taken account of. In most beams the shear stresses on the longitudinal vertical sections are either zero or negligibly minute. Here evidently is a case in which they cannot be neglected; the concrete lying between the steel rods and at the same level clearly drag upon the steel; that is, there are shear forces between steel and concrete on their longitudinal vertical sides as well as at top and bottom, and these shear stresses may vary across the horizontal transverse line. If S^1_h represent the variation per inch horizontal transversely of the horizontal shear upon longitudinal vertical sections, then the complete equation of variation is

$$S''_v + S''_h = T''_h.$$

This law is well-known in elastic theory, and it need not be proved here.

Mutual Shear Drag of Concrete and Steel.

Simply because the steel and concrete are jointed together so as to be compelled to stretch equally along longitudinal lines, and therefore be subjected to unequal stresses, it is clear that the concrete exerts on the steel all round its periphery a special shear drag to prevent the steel stretching so much as it would do if it were not attached to the concrete, while the steel exerts on the concrete surrounding it a reciprocal shear drag stretching it more than it would do if the connection were fractured. This interaction between the two is analogous to that called "self-strain," although here it arises because of, and in proportion to, the externally applied loads. It produces special curvature of the transverse sections in the concrete in the regions immediately outside the periphery of each steel bar, and also special reverse curvature in the transverse sections of the steel immediately inside these peripheries. These spherical curvatures are

Dimples

in the regular lay of the total transverse section of the beam—dimples such as were referred to early in this paper. They produce special inequality of the distribution of horizontal extension both in the concrete and in the steel in the close neighbourhood of their dividing surfaces. This special inequality of distribution is such as to make the extension of the concrete close to the steel greater, and consequently also its tensive stress greater, than the average or normal in the concrete at the same level across the section; and such as to make the extension of the steel immediately inside its periphery less, and the tensive stress in the steel proportionately less than the average in the steel at the same level—still less than the maximum at the mid-width of the steel section. This rounding off of tension strain and stress in both concrete and steel near their dividing edges approximates the stresses in the two at these separating surfaces to such a degree that, although the concrete and steel stresses themselves are by no means equal, still they are able to obey the law

$$S'_v + S''_h = T''_h$$

on each side of the division. In fact, obedience to this law is the limiting factor which determines the amount of the rounding off in each material. It will be readily understood that the special rounding across these divisions greatly increases the local shears in both materials above the average shear across the whole width of the beam section at each such level. To calculate the exact amount of this local excess shear is too complex and difficult a problem to attempt within the scope of this article, and requires the application of other fundamental elastic laws that have not been referred to here. Sufficient to say that the excess shear stress is proportional to the difference of the elastic moduli of the two materials, and that it is greatly diminished by shouldering and collaring such as is employed in Thacher bars, provided the shoulders have no sharp corners. These shoulders transmit the integral shear forces, or a large part of them, from material to material by thrust in substitute for shear stress on longitudinal dividing surfaces. With plain reinforcing rods or wires, the local excess shear probably extends in the steel inwards from the steel periphery not more than $\frac{1}{100}$in. and outwards in the concrete from the same periphery not more than about $\frac{1}{10}$th or $\frac{1}{8}$th of an inch.

Another Effect of these Dimples

is practically important. It is that they make slightly untrue the statement that the stretch of steel and concrete is the same at the same level in the section. They are actually the same only at the precise peripheral contact surfaces between them. The stretch here is greater than the average stretch in the concrete and less than the average in the steel. This latter is therefore greater than the average in the concrete. The maximum in the steel is still greater than the average in the concrete, and this applies, of course, equally to the stresses as well as to the strains. The pull of the rods is therefore somewhat greater than *e* times that of an equal concrete sectional area at the same level. The excess, however, cannot in well-designed practical work be large; and its exact calculation is not only difficult but also impossible without account being taken of the special connections, if any, of the ends of the steel rods to the supports, or of the special mode of anchoring these ends in the concrete.

As for the *average* shear stresses over the whole width of the section at those levels where both steel and concrete appear, these can be calculated on the approximate assumption that the tensions are accurately known, precisely in the same manner as has been illustrated above for the all-concrete levels. All the thrusts and tensions above the level investigated are to be reckoned for each of two contiguous cross-sections a small distance *b* apart; the difference of the two sums (reckoned algebraically giving + and — signs to the thrusts and pulls) is to be divided by B*b*, where B is the horizontal width of the steel-concrete transverse level line. The quotient gives $\overline{S}$, the average across the width B of the shear stress. Neglecting the feeble vertical compressive stresses on the horizontal planes, the maximum shear stresses may then be reckoned from

$$S_m = \pm \tfrac{1}{2}\sqrt{T^2 + 4S^2}$$

these being on planes at $\tan 2\,(\text{-}) = \frac{T}{2S}$ from the horizontal. These are greater in the steel than in the concrete because of T being greater. But it must be remembered that this calculation leaves out of account the excess shear stress due to the dimpling explained above.

(*To be continued.*)

REINFORCED CONCRETE SYSTEMS.

III.—Expanded Metal.

Expanded metal has been very extensively adopted of recent years for all kinds of reinforced concrete work in this country and abroad. It is now about 15 years since its advantages for reinforcing concrete were first practically recognised. It may thus be looked upon as one of the earliest systems of reinforced concrete in general adoption, and we, therefore, shall deal with the various uses of expanded metal for the strengthening of concrete in the third article of this series.

The basic patent for the manufacture of expanded metal was obtained in 1884 by Mr. John F. Golding, a native of the States. It is thus an American invention, and it was very shortly afterwards pushed extensively in this country as well as in the United States. At first the machinery was only capable of dealing with metal sheets of slight thickness, and it was therefore used as metal lathing for plastering. After some years' experience, however, the manufacture was improved and sheets of greater thickness were dealt with. These were suitable for reinforcing floors of small span and light loads, and for strengthening paving slabs and walls. As time went on the machinery was improved until it became possible to shear metal of considerable thickness, sufficient for all practical purposes.

One of the earliest buildings where expanded metal was used for reinforcing purposes was the General Post Office, St. Martin's-le-Grand, erected about 15 years ago. Here concrete floors and partitions had expanded metal placed therein to strengthen them.

The Manufacture.

In our issue for April 26, 1905, we illus-

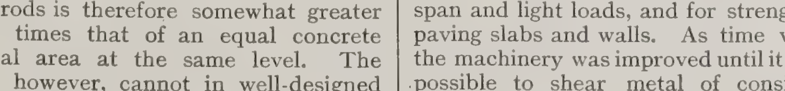


FIG. 1.

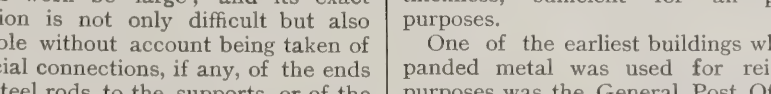


FIG. 2.

trated the present machine for manufacturing expanded metal. This will produce sheets up to 16ft. wide, the long way of the mesh.

The expansion of the steel sheets in process of manufacture is from two to twelve times the original width of the sheets according to the sizes of the meshes and the width of the strands formed. Owing to the stretching of the strands in the process of manufacture the expansion causes no diminution in weight and no reduction in the original lengths of the sheets. The sheets used range from 24-B.W.G. to ¼-inch plate.

When expanded metal was first used for the purpose of reinforcing concrete it was naturally first adopted for slabs, for which it was obviously suitable, and we may therefore deal with its use in this way before passing to the many other ways in which the material is now used.

The various expanded metal companies in America and England early made experiments to determine the degree to which expanded steel strengthened slabs of concrete in which it was placed, the economy in the amount of concrete effected by its use, and in order to discover a basis upon which to design work with such a reinforcement.

FIG. 3.

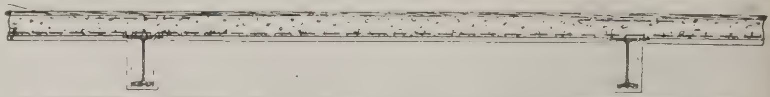


FIG. 4.

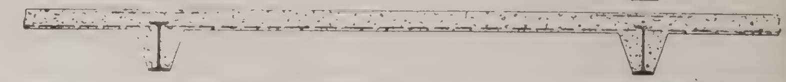
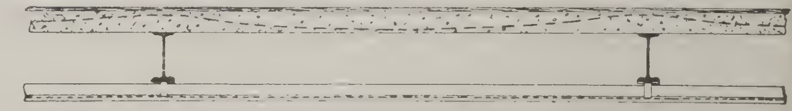


FIG. 5.



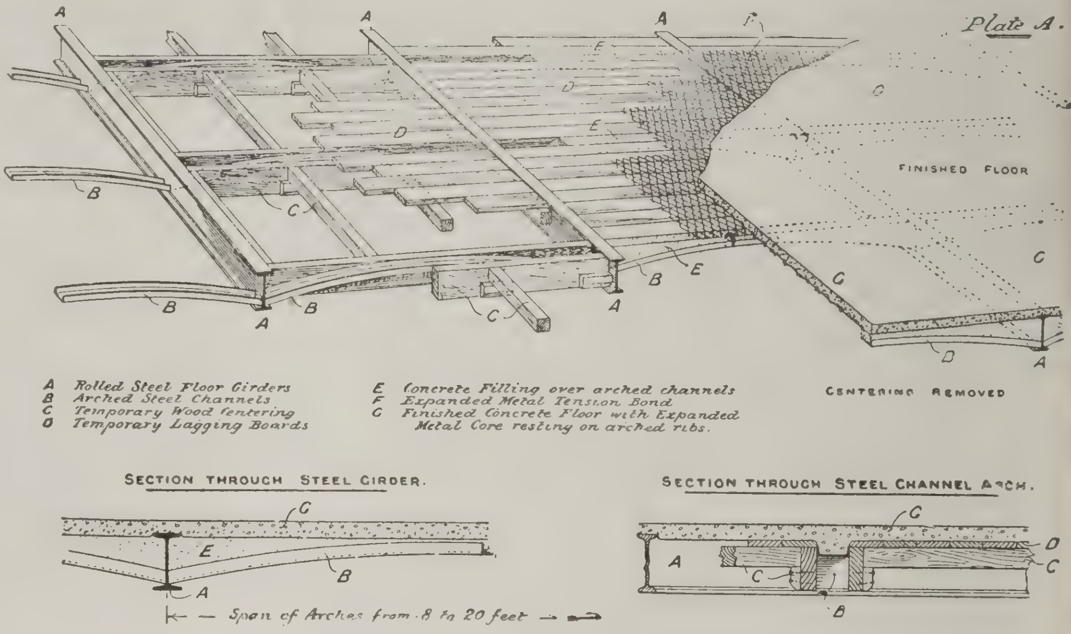


Plate A.
A
A
A
F
E
D
E
B
C
B
B
A
B
C
E
B
A
G
G
D
A
FINISHED FLOOR
A Rolled Steel Floor Girders
B Arched Steel Channels
C Temporary Wood Centering
D Temporary Lagging Boards
E Concrete Filling over arched channels
F Expanded Metal Tension Bond
G Finished Concrete Floor with Expanded Metal Core resting on arched ribs.
CENTERING REMOVED
SECTION THROUGH STEEL GIRDER.
G
E
B
A
Span of Arches from 8 to 20 feet
SECTION THROUGH STEEL CHANNEL ARCH.
G
A
D
C
C
B

FIG. 6.—THE CHANNEL ARCH FLOOR.

The experiment made by Mr. D. A. Low, in June, 1899, at the East London Technical College, elicited the fact that that expanded steel sheets possessed an average breaking strength of 31 tons per sq. in.

Experiments also made by Messrs. David Kircaldy & Son about the same time, showed that, whereas the average strength of the sheets before being sheared and expanded was 27 tons per sq. in., after [illegible] ment their strength became 32 tons per sq. in.

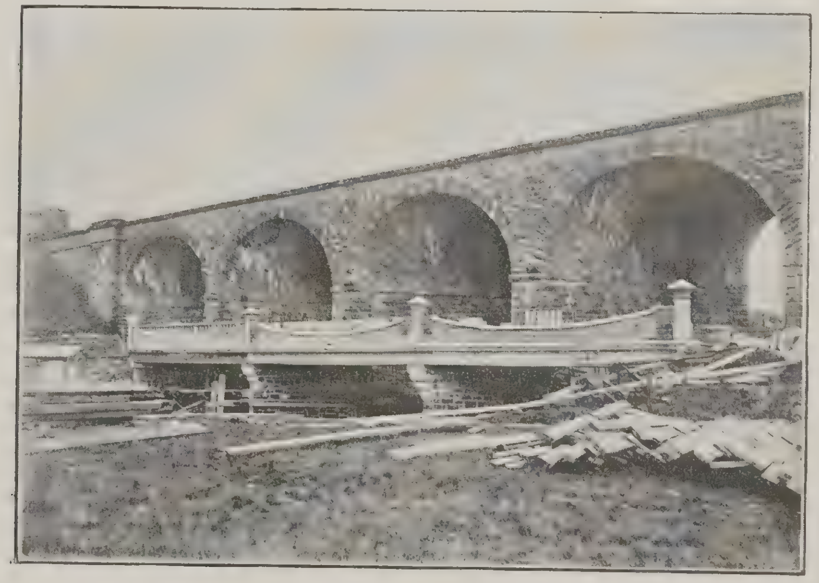


FIG. 11.—BRIDGE AT REEDSMOUTH. R. E. RIDDLE, SURVEYOR TO BELLINGTON URBAN DISTRICT COUNCIL.

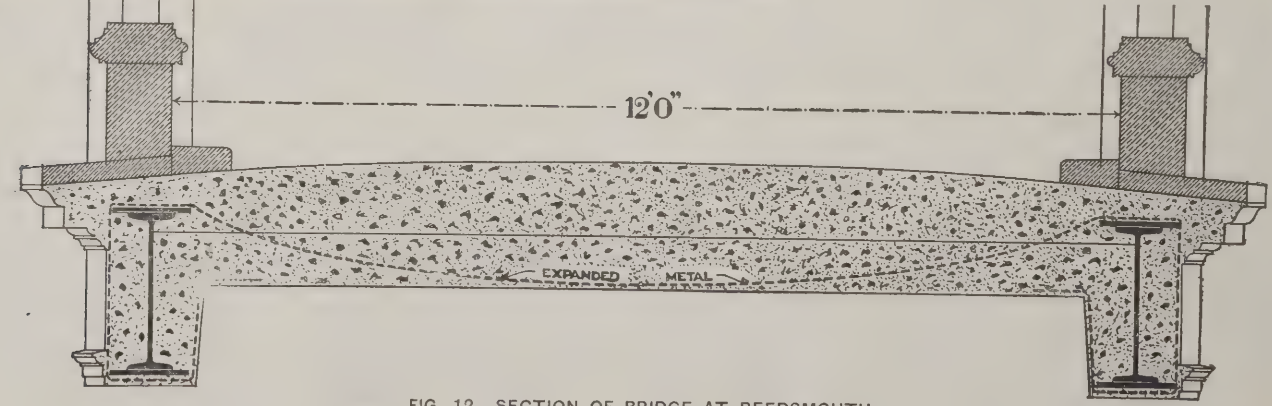


FIG. 12.—SECTION OF BRIDGE AT REEDSMOUTH

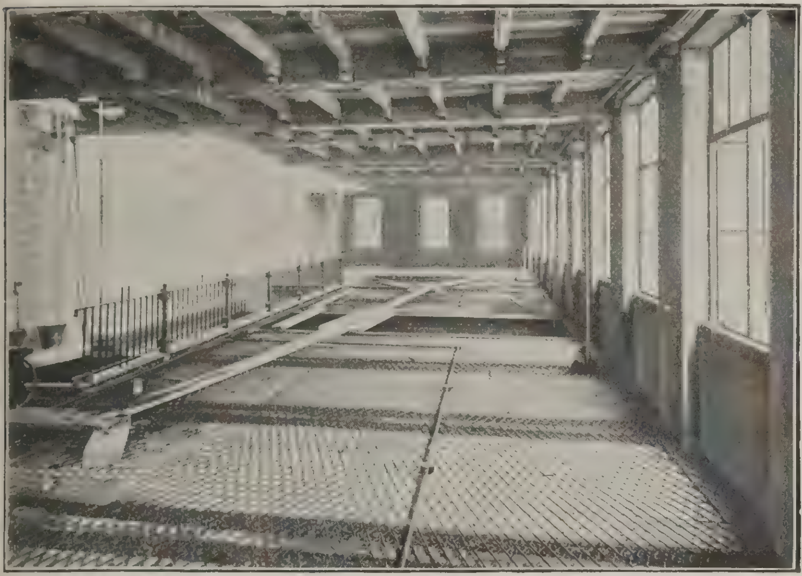


FIG. 7.—FLOOR IN ELECTRICITY GENERATING STATION AT CHELSEA.

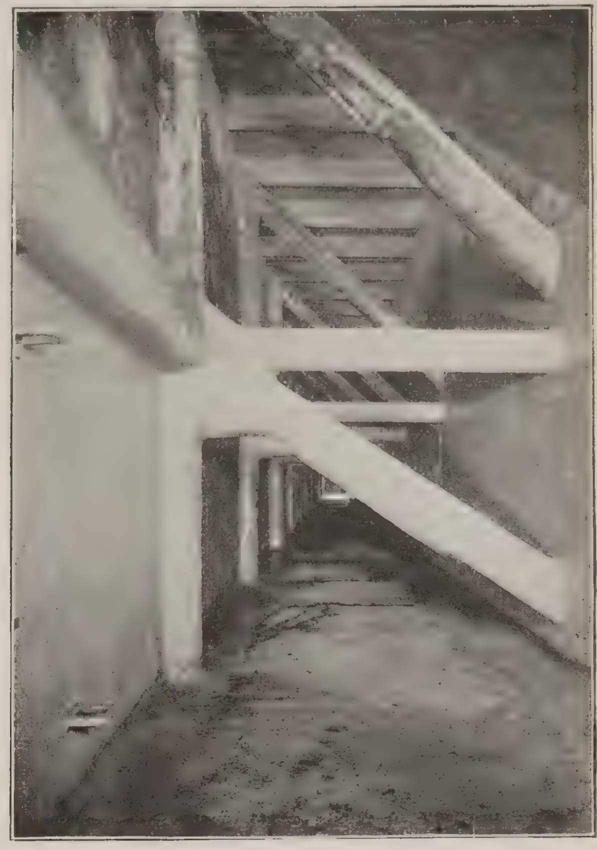


FIG. 8.—TRUSSES, STORAGE TANK, CHELSEA PUBLIC BATHS.

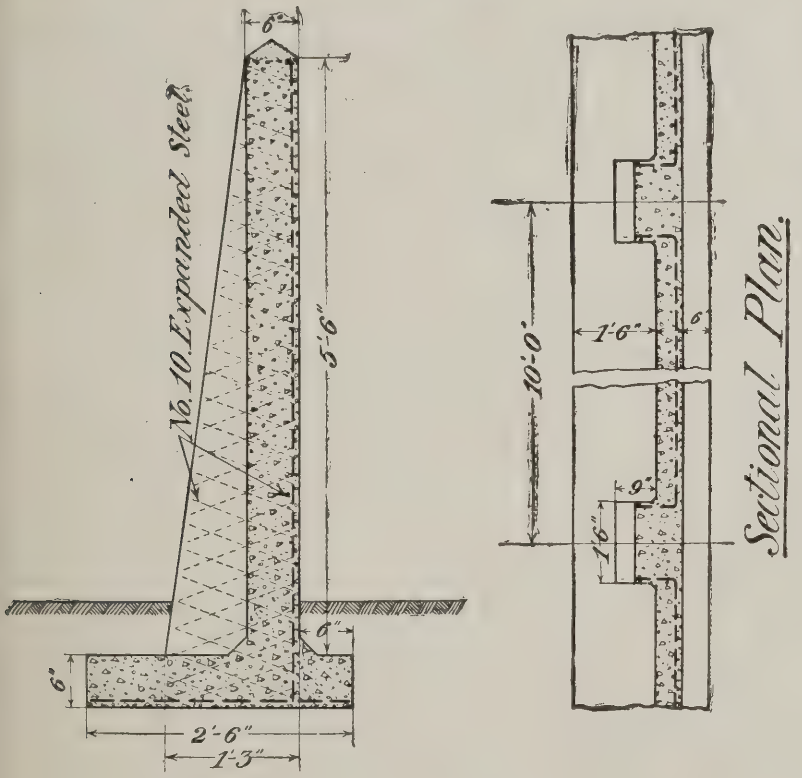


FIG. 9.—BOUNDARY WALL, HARTLEPOOL CEMETERY.

Tests on Slabs.

Messrs. Fowler & Baker, in April, 1896, carried out some tests upon the strength of slabs reinforced with expanded metal and uniformly loaded. The composition of the concrete used in these tests was 1 of cement, 1 of Leighton Buzzard sand, and 2 of Thames ballast. The expanded metal was of 3-in. mesh reckoned across the short way of the diamond.

The following table gives the average results of the tests on slabs 3ins. thick and 2ft. wide :—

Clear Span.	Thickness of Ex. Metal.	Breaking Strength. (cwts.)
3ft. 6in.	$\frac{7}{32}$in. by $\frac{3}{32}$in.	15·86
3ft. 6in.	$\frac{7}{32}$in. by $\frac{5}{32}$in.	19·28
6ft. 6in.	$\frac{7}{32}$in. by $\frac{3}{32}$in.	4·61
6ft. 6in.	$\frac{7}{32}$in. by $\frac{5}{32}$in.	5·07

A series of experiments was also carried out in 1899 at Newcastle before a joint committee of representatives of the Northern Architectural Association, Newcastle, Gateshead and Tyne District Master-Builders' Association and the Council of the Building Trades Exchange, upon which we reported at the time. The concrete of these slabs was composed of 4 parts clean washed gravel, 1 part clean sand, and 1 part Portland cement in the case of the 5-in. slabs; and of 2 parts gravel, 1 part sand and 1 part Portland cement in the case of the 3--in. slabs. It was

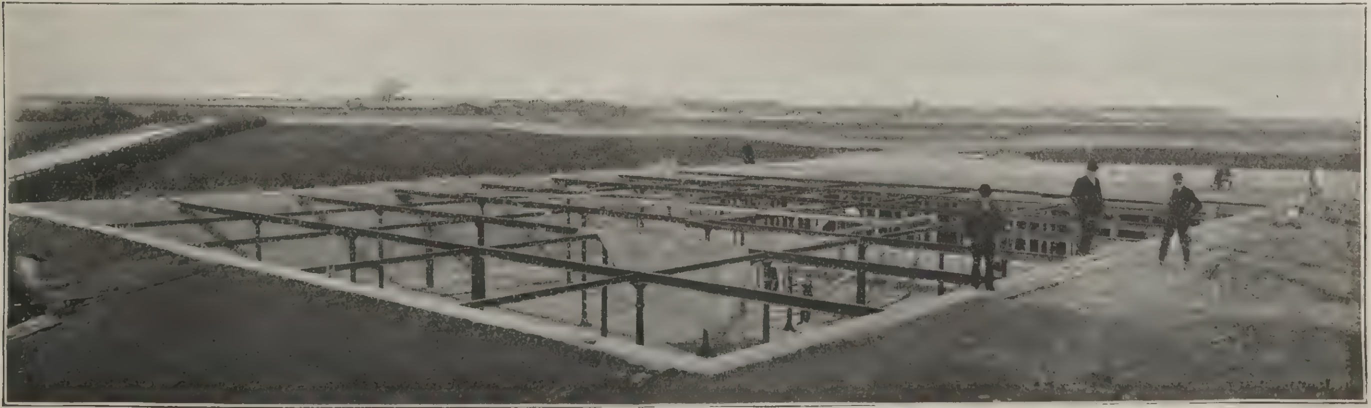


FIG. 10.—SCUNTHORPE WATERWORKS, NEAR DONCASTER.

thus respectively, five and three to one. Each slab was 4ft. wide and the expanded metal 3-in. mesh. The results of these tests are given in the following table :—

Size of Slab.	Clear Span.	Thickness of Slab.	Thickness of Ex. Metal.	Breaking Strength (lbs.)
8ft. × 4ft.	7ft.	5in.	$\frac{1}{4}$in. × $\frac{3}{16}$in.	26,642
8ft. × 4ft.	7ft.	3in.	$\frac{1}{4}$in. × $\frac{1}{2}$in.	10,797
6ft. 6in. × 4ft.	5ft. 6in.	5in.	$\frac{1}{4}$in. × $\frac{3}{16}$in.	38,129*
6ft. 6in. × 4ft.	5ft. 6in.	3in.	$\frac{1}{4}$in. × $\frac{1}{8}$in.	12,678
5ft. × 4ft.	4ft.	3in.	$\frac{1}{4}$in. × $\frac{1}{8}$in.	23,957
5ft. × 4ft.	4ft.	5in.	$\frac{1}{4}$in. × $\frac{3}{16}$in.	30,308*

* Unbroken at this load.

In 1903 a test was carried out by Messrs. A. T. Walmsley, J. P. Allen, and A. Home Morton on a slab of much greater span than the foregoing. The expanded steel used was No. 10 3-in. mesh, $\frac{1}{4}$in. by $\frac{3}{16}$in. strands. The slab was 7ins. thick and the expanded metal was placed as close to the underside as possible. The concrete was composed of 1 part Portland cement, $2\frac{1}{2}$ parts brick broken to pass a $\frac{3}{4}$-in. sieve, and $1\frac{1}{2}$ sand. The unsupported area of the slab was 15ft. by 15ft. and it had a 6-in. bearing on all four sides. The slab finally gave way under a total load of 56 tons 11 cwt.

Formulæ derived from Experiments.

Many other tests were carried out in America, and from them the engineers of the manufacturing companies were early in possession of facts which enabled them to draw up a rational method of calculation which is practically the same as the generally recognised methods adopted at the present day.

We might refer those interested to a paper read by Mr. Arthur T. Walmsley before the British Association at Bradford in September, 1900, in which the method of calculating the reinforcement of slabs or beams was carefully gone into. This contribution is valuable as showing that, as a result of tests on expanded metal, an independent engineer of eminence had placed before the profession an easy and accurate method of ascertaining the proportion of steel to utilise the strength of concrete to the full.

The various types of floor construction

adopted are shown in Figs. 1-5. Figs. 1 and 2 show the forms best adapted for long or short spans. In Fig. 1, the expanded steel follows the line of tension in the beam, but it is often more practicable to use a layer embedded throughout the under side of the concrete with tension strips over the intermediate bearing at the top of the concrete, *i.e.*, at the point of contraflexure, as shown in Fig. 2. In the system shown in Fig. 3 the concrete is flush with the top of beams, while the bottom flange of the joists is encased with expanded steel lathing, upon which the plaster is applied. In Fig. 4 the floor slab is placed on the top of the joists. Fig. 5 shows a floor with a suspended expanded metal and plaster ceiling, this being done where it is desired to have a flat ceiling.

The Channel Arch Floor.

One of the earliest forms of floor to be adopted with expanded metal was the channel arch floor shown in Fig. 6. In this system the spans have varied between 12ft. and 25ft. The ribs or secondary beams are formed of curved steel channels filled in with concrete to the underside of the decking of the floor, and set at various distances according to the span and load to be carried. In the end bays of such a floor, where the channels come against the walls, straight steel channels are placed in chases in the walls to form the necessary bearing, and tie rods take up the horizontal thrust. The rise of the channels is made 1in. per foot of span, and the size of the channels is calculated from the following formula :—

$$A = \frac{Ldl^2}{8000r}$$

Where A = area of channel required in sq. ins. ; L = total safe load per sq. ft. in lbs. ; d = distance between ribs in ft. ; l = span in ft. ; r = rise of arch channel in ins.

It may be mentioned that the centering for these floors is supported upon the cambered channels by means of bolts passing through the side forms which retain the concrete of the ribs. Among the buildings in which floors were executed upon this channel arch system are : warehouses at the Manchester Ship Canal ; Armstrong, Whitworth & Co.'s Elswick Works ; Granton Gas Works ; breweries at Gateshead-on-Tyne, Stockwell, S.W., Horselydown, S.E., and Guildford.

In the construction of floor slabs it is plain that expanded metal is a most economical form of reinforcement. There is much less labour entailed than with interlacing rods which have to be placed in position and kept in place. The sheets of expanded metal are simply laid upon the centering and the concrete shovelled in upon them. Fig. 7 shows such a floor in course of construction before the concrete is filled upon the expanded metal sheets. This particular floor is at the electric generating station at Chelsea which supplies power for the Underground Railway. The whole of the floors in this building are carried out with expanded metal.

It stands to reason that expanded metal extending across the full width of a floor slab develops the strength of the concrete to the full and has no tendency to pull out such as round rods without rigidly attached shear members have.

Expanded metal has been extended in its use beyond the floor slab of recent years, and is now used for the construction of beams, columns, pillars, piles and other parts of construction.

The use of the metal for the reinforcement of

Beams

is interesting, and has been adopted to some extent in the United States. In this connection it must be explained that in shearing the metal before expanding it, it is possible to leave a solid uncut strip at the end. This strip of metal is made generally of three widths—namely, $2\frac{1}{4}$ins., 3ins. and 4ins. The adjoining sheared metal is pulled out into the well-known diagonal form so as to be of the following lengths : 6ins., 9ins. and 12ins. The expanded mesh work is then turned at right angles to the solid strip so as to stand vertically upwards in the beam like an **L**. The solid metal strip consequently serves as the tension rod in the bottom of a beam, while the vertical mesh work performs an important part—namely, reinforcing the beam against shear stresses, the mesh work crossing the lines of compressive and tensile stresses in a beam at right angles, which lines extend as curves from the top and bottom of the beam respectively.

Columns.

The same form of expanded metal bar is used for the vertical reinforcement in columns or pillars, the solid metal strips being placed at the outside of the column and the mesh-work extended inwards towards the centre. Another form of column reinforcement consists in placing round rods vertically and wrapping round them, at the outside, sheets of expanded metal. This is a form in which

Piles

are made with expanded metal. The sheets strengthen the pillar or pile from splintering outwards under pressure or being damaged by vibration stresses induced by pile driving.

It may here be mentioned that this ability to leave a strip of metal at the edge of the sheet is also found of service in connection with roof work, this strip being bent over angle irons to resist the tendency to sliding.

As regards Wall Construction,

expanded metal is placed either in the centre or on both faces of a wall. Fig. 8 shows an example. The wall seen on the left of the view is a retaining wall for the surrounding earth and has sheets of expanded metal on external and internal faces. The wall shown on the right is an internal wall sustaining the external wall of the building above ground, and has a sheet of expanded metal in the centre. The cross-bracing shown is constructed of joists encased in concrete, while the roof of the dry area is the pavement of the street above. Another example of wall construction is shown in Fig. 9—namely, a boundary wall at Hartlepool, with buttresses and footings reinforced with the same material. The wall was constructed by means of temporary wood centering covered with oiled paper sheeting, the sheeting doing away with the necessity of rendering the concrete in cement after the centering had been struck. Expanded metal has been greatly used in foundation work ; and, in fact, it is impossible to enumerate all the uses to which it has been put, and will probably be put, in the future.

Among the various adaptions of expanded metal we may refer to its extended use for the construction of

Reservoirs and Tanks

for water and sewage. Not only are the walls constructed with expanded metal reinforcements, but the roofs also. Fig. 10, shows an example of a reservoir.

Expanded metal has also been used for

Retaining Walls and Sea-Walls.

An example of the latter at West Hartlepool was illustrated in our issue for March 8th, 1905.

We also illustrated in our issue for September 2, 1905, another instance where expanded metal has been found of great service, namely,

Grain Silos.

Figs. 11 and 12 show the use to which expanded metal has been put in the way of a bridge at Reedsmouth. We have not space to illustrate other interesting bridges that have also been constructed with expanded metal.

In our next "Concrete and Steel" Supplement we shall publish an article in which the use of expanded metal in sewer and water-pipe construction is referred to, and we therefore need not illustrate its use in this respect.

Several Official Fire Tests

have been made upon floors constructed with expanded metal, in which it has been shown how excellent is the resistance offered by such floors. The most recent and the most severe test was dealt with in our issue for June 6th last, and need not here be gone into at length again.

THE BUILDERS' JOURNAL

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[*The Index to Vol. XXIII. can be obtained from the Publisher post free for 1d.*]

The Congress. THE Congress has come and gone, and we give our readers fifteen columns of it this week: that, however, not as any lengthy report of what has been said, but as a succinct summary of the various papers read and the discussions that followed the reading of them. If any readers find it a hard task to get through these fifteen columns, let them remember that this is a comparatively entertaining account of the proceedings. We fear, indeed, that the gift of elaborating on hackneyed subjects, and speaking volumes of airy nothings is quite an international one, and it is no more inspiring in the French tongue than in English. Let us take note of a few significant facts. At the opening meeting of the Congress the Guildhall was filled with members, and there must have been more than 1,700 persons present; while at the garden fête last Thursday evening it is stated that there were 3,000 persons present. Of course, a good many of these were ladies, but supposing we place the number of architects at 1,000, the fact that there were not more than 50 at any of the sessional meetings is, to say the least, suggestive, and the only inference is that dry talks upon subjects about which so much has been said did not attract members. Moreover, of those attending the meetings a small handful of delegates took the leading part, while the rest looked on with more or less interest. The sectional meeting upon the subject of steel and reinforced concrete construction was a case in point. Some of the papers contributed were undoubtedly useful and instructive, but the majority were by theorists, and those who took part in the discussion may, on the whole, be held to know next to nothing of the subject, having had no practical experience, and, so far as we could judge from the tenour of their remarks, had not even taken the trouble to learn something from the recognised works on reinforced concrete construction. The papers and the discussions and resolutions on architectural copyright and the ownership of drawings were the most productive of good, due to the leadership of those who had made a special study of the subject. But, after all, this meeting was only sparsely attended, although we have no doubt a larger meeting would have taken just the same view, as the subject is one on which the profession feels strongly. The organisation of public international architectural competitions might well have occupied the attention of the Congress to a greater extent than it did. It was distinctly a subject which was within the province of an International Congress of Architects, but only very few members attended the meeting, and consequently the foreign delegates did not learn the strong views English architects take in the matter. The way in which the rights of competitors are regarded abroad by the profession and public is, indeed, in need of much reform. As for such subjects as the execution of Government and municipal architectural works by salaried officials, the education of the public in architecture, the architect's control over the craftsman, Government responsibilities in the conservation of national monuments, the architect's training in the crafts, and the laying-out of open spaces—these were generally of such nebulous character that nothing substantial was likely to come out of them. The subjects are, in fact, worn almost threadbare. In our opinion, much more useful results could be obtained if subjects and resolutions for discussion were set by the Permanent Committee of the International Congress and discussed by the architectural societies of each country, the results of these discussions being sent to the main body and reported on to the Congress when in session. They would thus be much better thrashed out than it is possible at the hands of a few members. The subjects, however, that might gain in the discussion by a large meeting might be grouped together and the papers put in print before the meeting, so that they could be read at leisure. This would save time, and would enable a decision to be come to at one largely attended meeting which might fairly be said to represent the collective opinion of the profession. There should be, too, a recognised quorum for the passing of any resolution: otherwise, as has happened during this last week, opinions set down as nominally representing the "International Congress of Architects," become nothing more nor less than those of a few interested members whose views may or may not be worth having. In conclusion, we would urge the greater importance of considering soberly the logic of individual opinion than the collective opinion as arrived at by such congresses, whose chief function is social. Why, indeed, not admit the fact clearly brought out during the last week—that this Congress is a social event? Why affect so much humbug about general questions of architecture when the majority of members do not attend, but go away sightseeing (as one would expect them to)? Let us take the truth to heart. With the thermometer in the eighties architectural ethics can never stand a chance against outdoor excursions and social meetings.

Two Exhibitions. IN the Victoria and Albert Museum at South Kensington the prize designs submitted in the National Competition are now on view. While in the several classes of applied design some excellent work is shown, and the metal work is especially promising, there is but a poor show of architectural drawings: what the bulk of the designs must have been can only be gauged from the examiners' remark "that many are so inferior and so destitute of any architectural quality that they should not have been submitted." Architectural teaching in the schools up and down the country is clearly very unsatisfactory. As an example of what can be done, however, we have only to turn to the exhibition of students' work done by the architectural class under Professor Beresford Pite, shown in block "C." This is of a high average quality and the work is carried out on a big scale, most interesting being the designs for a Nelson monument in St. Paul's, drawn out one-quarter full size. These are, indeed, very admirable studies.

THE INTERNATIONAL CONGRESS OF ARCHITECTS.

Summaries of Papers Read.

In our issue for last week we reported the opening meetings of the Seventh International Congress of Architects, in London, up to the time of going to press. In the present issue we give summaries of the papers read at the various subsequent meetings, together with the resolutions passed and synopses of the discussions that took place.

STEEL AND REINFORCED CONCRETE CONSTRUCTION.

The papers on this subject read before the meeting of the Congress on Tuesday were given in our issue for last week. The discussion that followed was diffuse, and we do not find space to report it. The following resolutions were passed :—

That it is the sense of this meeting that an enquiry into the cases of failure of reinforced concrete and their causes would be most desirable.

That where reinforced concrete is intended to be fire-resisting the greatest possible care must be taken as to the nature of the aggregate and its size, and also as to the protection of the steel.

A paper by Mr. Peter D. Wight on "The use of burned clay products in the fireproofing of buildings in the United States of America" was read. We hope to give this paper together with illustrations, in our next "Fire Supplement."

OFFICIAL ARCHITECTURE.

Summaries of the papers on "The Execution of Important Government and Municipal Architectural Work by Salaried Officials," read before the meeting of the Congress on Tuesday, were given in our issue for last week.

In the discussion following the reading of the papers Mr. George Oakley Totten, junr. (Washington Architectural Club), gave an account of the methods followed in the United States. There were, he said, three classes of Government buildings, (1) those known as federal, such as naval and military buildings, etc., and all post-office buildings; (2) State buildings, of a similar character to the federal buildings but under the control of the various States; and (3) municipal buildings, under the direction of the municipalities throughout the country. The municipal work was generally carried out by city architects, though, in the case of particularly important buildings, competitions were sometimes held. The same applied to the buildings of the various States, while, as to federal buildings, these were partly under the control of salaried architects, but many of the larger works were given out to practising architects of ability. Washington had no city architect, but there was a Supervising Architect's office, under the Treasury Department, in which between 150 and 250 draughtsmen were employed, the bulk of the work being post-office buildings, custom houses, etc. In respect of these last it was interesting to note that Congress this year had voted 39,000,000 dollars for federal buildings to be carried out through the official bureau. The Tarsney Act of 1893, however, gave the Secretary of the Treasury power to hold competitions for any important federal building, and in this way thirty-two competitions had been held since 1897.

Mr. F. E. P. Edwards, city architect of Bradford, claimed that excellent work was being done by salaried architects throughout the country, and he put it to the meeting that it was perhaps on account of the fear of architects being deprived of work which they considered was their own portion, that all the outcry against official architects was raised. The bottom of the whole evil of incompetent architectural work being done was that too many young men were put into architects' offices who had no talent for the work, but who, nevertheless, at the end of their pupilage, were turned loose to get their living somehow.

Mr. A. B. Plummer, of Newcastle-on-Tyne, urged that it was especially wrong for official architects to be allowed to engage in private practice, competing in that capacity with ordinary private architects, more particularly as the latter had to have their plans passed by the official architect.

Other speakers followed, including Mr. W. E. Riley, superintending architect to the London County Council, who made a strong stand for the rights of salaried architects. In the end the following resolution was passed :—

That in the future, in the interests of the administrations and the public, and in the higher interests of the art of architecture, public bodies, whether governmental, provincial or municipal, should entrust important works of architecture only to qualified professional architects, either by competition or otherwise.

INTERNATIONAL ARCHITECTURAL COMPETITIONS.

On this subject two papers were read before the Congress on Wednesday, one by J. Guadet (professor at the École des Beaux-Arts, Inspecteur-Général des Bâtiments Civils) and another by M. Gaston Trélat, of Paris. M. Guadet expressed the opinion that the cost of the competition should be kept distinct from the cost of the building, and that it was dangerous to promise the execution of the work to the authors of the first-premiated design. The assessing of the competition should be by a jury of architects of every nation, these being in the proportion of one assessor to ten competitors; and every nation represented by fewer than ten competitors, with a minimum of five, should have the right to one assessor. In the case of double competitions, the chosen competitors in the first—the sketch competition—should not be classed, and premiums should be reserved as an extra matter for the final competition. Designs should be exhibited before and after adjudication if necessary. In the case of double competitions, however, it was preferable that the sketches submitted in the first should not be exhibited, but held back for inclusion in the exhibition of the designs submitted in the final competition. M. Guadet read the rules formulated by the Society "Architectura et Amicitia" (Amsterdam) for the organisation of public international competitions. By these it is recommended that such competitions shall be double, preliminary competitions being opened in the various countries, or groups of countries, through the medium of the permanent commissions constituted, and each competitor in the final competiton paid an honorarium. The jury, it is recommended, should consist of half the number less one of the competing members of the country in which the competition takes place. The amount of the premiums should be double what would be paid to an architect entrusted with the design in the ordinary way, and the premium should not be deducted from the successful architect's fee.

A short discussion followed the reading of the papers, and the following resolution was passed :—

That a special committee of seven members be appointed by the Permanent Committee to go into the whole question of competitions and present a report at the next Congress.

OWNERSHIP OF ARCHITECTS' DRAWINGS.

Four papers on the subject of "Architectural Copyright and the Ownership of Drawings" were read and discussed before the Congress at the meetings on Wednesday and Thursday, the authors being Mr. H. Heathcote Statham, Signor D. Pablo Salvat (Spain), M. Gaston Trélat (Paris), and M. Georges Harmand, advocate of the Court of Appeal, Paris.

Mr. Statham, dealing with the question whether the drawings and specification of the architect should be retained by him or handed over to his client, said that in France and Germany no legal question was raised, the architect retaining the drawings as a matter of law, and in England the custom had been almost universally the same. But in the case of *Ebdy v. M'Gowan* (1870) the Court ruled that, the building not having been carried out, the drawings must be handed over to the client on his paying for the time expended on them; and in the case of *Gibbon v. Pease* (1904) the Court ruled that the precedent of *Ebdy v. M'Gowan* covered all cases, whether the building had been carried out or not, and that the client had a right to demand all the drawings, the Court refusing to hear any evidence on the side of the architect, whose drawings and specification could therefore, in England, be legally claimed by the client, although he already had what he really paid for—the building. This was a manifest injustice to the architect. Moreover, the custom of handing over the drawings to the client when the building had been planned, but *not* carried out, was a mistake; as an unscrupulous client had only to say that he had changed his mind in order to get possession of the drawings and use them as he pleased, with no further compensation to the architect. The wording of clause I. of the R.I.B.A. Scale of Charges was most unfortunate, as it appeared to state (though not so intended) that the architect's commission was for producing drawings of a building. The wording of this clause should be amended, and he (Mr. Statham) moved a resolution that the necessary steps should be taken to secure this end and to legalise it.

The trend of the discussion following the reading of the papers was towards treating the matter from an international standpoint so as to give a sign-manual that the architect's drawings were his own property. Various resolutions and amendments were put forward, and eventually the following was carried :—

That this Congress is of opinion that the architect is employed to produce a building, and that all drawings and papers prepared by him to that end are undoubtedly his property.

THE ARCHITECT-CRAFTSMAN.

On Wednesday papers by Mr. Reginald Blomfield, A.R.A., Mr. W. R. Lethaby, M. van Gobbelschroy (Belgium), Professor

Otto Wagner (Austria), M. Gaston Trélat (Paris), and MM. Lesage and Poupinel (Paris) were read on the question of how far the architect should receive the theoretical and practical training of the craftsman. Full abstracts of the papers by Mr. Blomfield and Mr. Lethaby are given on pp. 39 and 40 of this issue.

M. Gobbelschroy urged that it was necessary for the architect to be able to work well himself in order that he might be able to command well, but, while he should have sufficient technical knowledge to understand the details of craftsmanship it was not necessary for him to be an expert craftsman.

Professor Wagner's conclusion was the same.

MM. Lesage and Poupinel treated the subject not so much on its general lines as on the particular methods followed in France. It was pointed out that the French Government had organised workshops and professional schools in which workmen only were trained, but it had not yet created any technical school for the training of masters of work, contractors and architects. The Ecole des Beaux-Arts was not a school of architecture, but a special school of the Fine Arts, in which architecture occupied a place similar to painting and sculpture or engraving. The Beaux-Arts ideal was to train the architect's mind in the direction of art and not to teach him a trade. Students were chosen by competition, and on their merits of intelligence and aptitude. The Beaux-Arts school dominated architecture in France and made its influence felt even in the South of Europe, and especially in America. The examinations and competitions in mathematics and construction imposed on students from the very beginning had no other aim than to eliminate those who were unfit for the study of building science, but for technical knowledge students had to go elsewhere, obtaining their experience more particularly in building yards. This chance way of obtaining practical experience, however, was not satisfactory. The instruction should be given in a methodical way, so that side by side with the Beaux-Arts there should be established schools of applied building, analogous to the schools of artillery, military engineering, &c., in connection with the Ecole Polytechnique.

The following resolution was passed:—

That this Congress considering that the architect, the master of the works, having under his immediate direction workmen and artisans of the most varied bodies of the State, and utilising the services of the most varied industries, has no means of acquiring in each of these trades and in each of these industries the complete knowledge of a specialist, expresses the desire that to architectural students the opportunity should be given to acquire in a general but exact manner the technical parts of the various trades and industries of the building trade without claiming to practise these trades and industries. It also expresses the wish that between the schools international and continuous relations may be established.

THE PLANNING AND LAYING-OUT OF STREETS AND OPEN SPACES.

Six papers on this subject were read before the Congress on Wednesday, the authors being M. Ch. Bulls (on behalf of the Société Centrale d'Architecture de Belgique), M. Eugène Hénard (Paris), Signors Vivó, Ribós and de Quintana (Spain), Dr. J. Stübben (Berlin), M. Gaston Trélat (Paris), and Mr. Raymond Unwin.

M. Bulls said that in laying-out streets there were three hypotheses to be considered: (1) An entirely new town might be founded (as at Zeebrugge, in Belgium); (2) a quarter of an old town might be transformed into a modern quarter; or (3) a new suburb might be added to an old town. Principal arteries should be straight, and secondary streets sinuous, and any "squares" arranged in these streets should be oval, not circular. Crossed-shaped intersections should be avoided and star-shaped "squares" condemned.

M. Hénard described the plans of Berlin, London, Moscow and Paris, and emphasised the usefulness of comparing the lay-out of large towns.

Signors Vivó, Ribós and de Quintana dealt with the planning of streets in respect of latitude, sunlight, &c., and stated that the more populous the city was the greater should be its area of open spaces.

Dr. Stübben, after defining what he thought should be the widths of main thoroughfares and side streets, passed in review the cities of the Greeks, the Romans and the Middle Ages, and then, applying principles to modern-day cities, said that the various parts should be divided up in accordance with the purpose which they were intended to serve—*i.e.*, rows of houses, detached or semi-detached buildings, tenements, shops, manufactories, &c. Dr. Stübben showed a number of lantern slides of Continental "places" in connection with his paper.

Mr. Raymond Unwin pointed to the town developments in Germany, where municipalities had extensive powers, and were in the habit of making plans to regulate the development of their towns. It was necessary, he said, for our municipalities to secure additional powers, and probably the best way to begin would be by forming committees in each town to watch over and criticise town development from the æsthetic point of view.

Mr. Frank Miles Day, president of the American Institute of Architects, exhibited some views of American cities, which were received with much interest.

CONSERVATION OF NATIONAL MONUMENTS.

Six papers on this subject were presented to the Congress meeting on Wednesday evening, the authors being Professor G. Baldwin Brown, M. Besnard (Paris), Professor W. R. Lethaby, Signor Ramoneda (Barcelona), the Tuscan College of Engineers and Architects, and M. Gaston Trélat (Paris).

Professor Baldwin Brown gave a succinct account of the measures actually in force on the Continent for the preservation of national monuments. Almost everywhere abroad, he said, the initiative had been taken by the Government, whereas in Britain private individuals and societies had practically done all the work. The British Ancient Monuments Protection Act of 1882, passed as a Government measure, was really due to private enterprise, though more recently there had been encouraging signs that British Governments were coming to recognise this protection as a suitable matter for State care, and the Ancient Monuments Protection Amendment Act of 1900 represented a distinct advance. On the Continent State commissions had been charged with the upkeep of national monuments, and it was very desirable that similar State action should be taken in this country.

M. Besnard took up the subject from the point of view of restoration, urging that a standard programme should be established making it obligatory to preserve records of any work which was to be restored, these records being on a large scale showing the actual condition of the monument, with casts of the sculpture and most characteristic profiles.

Professor Lethaby also took the question of restoration as his theme. Restorers, he said, acknowledged that harm had been done in the past, and then, with professions of sympathy, they went and did likewise, taking the new word "repair" in place of the old word "restoration," but with similar result. Renewal was going forward at quickened rate all over Europe, and the most ancient and beautiful buildings were those which were passed through the mill of restoration and left desolate. St. Front, Perigueux, excited so much interest that it was made over again. The Dom at Aachen was being covered up with fashionable marbles and mosaics. Murano Cathedral looked as though it had been supplied from a factory. And so with many others. The alternative of this method of dealing with old buildings was persistent care and repair. "If architects must restore, let them do it on paper only, without impairing the evidence of the building itself, evidence which disappears when they actually build their theories, so that we have not even the satisfaction of being able to prove them wrong. We can hardly go to any famous building in Europe without finding extensive works in progress; and, unless there is soon some great change of policy, little will be left that is truly old to hand on to posterity."

The contribution of the Tuscan College of Architects and Engineers dealt exclusively with the reports and writings of the late Professor Poggi, of Florence, in regard to the principles to be followed in the conservation of national monuments, and the necessity for Government support.

Commendatore Alfredi d'Andrade, on behalf of the Italian Government, presented a number of publications dealing with the methods adopted by that Government for the preservation of ancient monuments.

A short discussion followed the reading of the papers, and the following resolutions were passed:—

That the Government should be empowered, whenever a case arises, to expropriate a monument which is historical.

That this International Congress of Architects recommend that the British Government be approached with a view to appointing a Royal Commission to control and to extend the operations of the Ancient Monuments Protection Amendment Act of 1900, and to prepare an accurate catalogue of the ancient monuments of the British Islands, taking similar action to that of the Department of Ancient Manuscripts, and in agreement with the measures adopted in other countries.

THE ARCHITECT'S CONTROL OVER THE CRAFTSMAN.

"To what extent, and in what sense should the architect have control over other artists or craftsmen in the completion of a national or public building?" This question was the subject of six papers presented to the Congress at the meeting on Thursday morning, the authors being respectively Sir William Richmond, M. Nénot (Paris), Herr L. B. Müller (Germany), M. Gaston Trélat (Paris), Professor Otto Wagner (Germany), and Signors Amargós, Padrol, de Miquelerena and Valeri (Spain).

Sir William Richmond urged the greater collaboration of the architect, painter and sculptor, and suggested that, on the initiative of the Institute, a society should be formed comprising a small number of each section of the arts—perhaps six architects, six sculptors and six painters—which might in time become an advisory body to the Government and to the London County Council, both of which needed assistance, not only in commonsense, but also in good taste.

M. Nénot instanced the case of the Sorbonne in Paris, of which he was the architect. At the time it was building, he said, a fresco about 80ft. long had been decided upon for the great amphitheatre, to decorate the part at the bottom which supports the cupola. The success depended on the tone of this fresco. Puvis de Chavannes seemed to be the right man. With him the white stone wall, almost entirely covered over, would continue to bear its cupola. But Benjamin Constant, appointed for another decoration in the same building, wished to be appointed to carry out this fresco, and the President of the Republic, M. Grévy, informed the Director of Fine Arts that he wished very much that he should be given the work. The position of the architect was painful. To resist the head of the State was a difficult matter, but on the other hand with the powerful pallet of Benjamin Constant the semi-cupola would no longer be supported, and the general harmony would be destroyed. M. Nénot declared that if he were forced to accept Benjamin Constant he would give up the fresco and substitute an architectural motive for it. Then he was allowed to have Puvis de Chavannes. "This should always be the case; instead of the architect having a certain artist forced on him he should be given a great freedom in the choice of his collaborators, and he himself must point out the artists and follow their work, without any other preoccupation than the general harmony of his work; and he should leave to the painters and sculptors, who are responsible for their work, every liberty of form or of colour, provided they do not prejudice that general harmony without which no architectural work can really exist."

The following resolution was passed:—

That the architect, in the construction of a building, is to be given absolute power over the co-operating craftsmen, but in a special manner over the co-operating artists.

ARCHITECTURE AND THE PUBLIC.

On this subject, dealt with at the Congress meeting on Thursday, no fewer than eleven papers were presented, the authors being Mr. John Belcher, A.R.A., Mr. T. G. Jackson, R.A., Mr. Arthur Hill, B.E., M.R.I.A. (lecturer on Architecture at Queen's College, Cork), Professor von Leixner (custodian of the Imperial and Royal Central Commission, Vienna), Mr. Banister F. Fletcher, F.R.I.B.A., Signors Carmona, March and Sacanella (Spain), Professor Otto Wagner (Austria), M. Gaston Trélat and M. Albert Mayeux (France), M. Gaston Anciaux (Belgium), and Professor Jean Gilson (Brussels).

Mr. Belcher said the first thing was for the public to unlearn much that had been wrongly learned. The superstitions of antiquity and the "styles" must be exploded, and it must be made plain that neither a smattering of archæology nor a superficial study of "styles" afforded a sound basis for a critical judgment in matters of present-day architecture. Moreover, architecture was not merely a question of a beautiful exterior; the importance of the plan and of sound construction needed to be pressed home. Truth and beauty were the two governing principles, and truth required that a church should look like a church, a town hall like a town hall, and a private residence like a private residence. An external shell of plaster over brick must not present the appearance of blocks of stone, nor a steel structure cased with terra-cotta suggest solid masonry. Again, it was not sufficient for a building, in fact, to be strong and secure—it must look so, it must satisfy the eye. An engineer might, by exact mathematical calculation, know that the conditions of security were amply fulfilled, but the architect had to see to it that the work presented an appearance of strength and solidity. The public should be trained to appreciate the proper use of materials, questions of light and shade, proportion, mouldings, &c., whether by lectures or by articles published in book form, and illustrations should be abundant.

Mr. T. G. Jackson emphasised the importance of the public being qualified to know good architecture from bad, as they were the employers with whom the choice of designs for new buildings rested. The knowledge of architecture should be part of a liberal education. There was a vast bibliography of architecture, and there were the various means of education by lectures and excursions; but all these were inadequate to qualify for a sound judgment in dealing with modern architecture, because they treated the subject mainly from the point of view of archæology. Mr. Jackson took the imagined case of an archæologist called upon to make a selection from a set of competition designs and pointed out that this archæologist's standard of merit would be based on conformity to precedent and ancient example. Archæology would never teach us to build up a new design sensibly and beautifully; moreover, it only touched the outside features of bygone styles, not their inner reasonableness, and so long as it was thought that the essence of a style consisted in its outward features we should fail to understand its true nature. It was very desirable that the course chiefly taken by writers and lecturers on architecture should be reformed on the lines suggested; but, after all, the best means of education was by the production of well-designed buildings. Architects, indeed, were the best teachers, and real work was more edifying than any books or lectures.

M. Anciaux agreed with those who advocated the giving of lectures in schools and the creation of museums of architecture, both in capitals and in the smaller towns of the country. M. Anciaux, in the course of his paper, quoted the following caustic sentences from an article by Camille Mauclair:—

> "It is not a question of placing an individual who swears, who spits, who shouts, who does not wash himself, before a masterpiece and thinking one has done one's duty by him. What is wanted is to lead this individual by persuasive teaching to the idea that it is the duty of every reasonable being to become more refined; and it is in this way that he will be rendered capable of understanding and recognising in a beautiful thing the common inheritance of his race. In a word, it is necessary to form the character of the people in order to prepare it for art, and not to expect that in putting it into direct contact with art it will be provided with a character. A working man may render himself worthy of appreciating a masterpiece, but a masterpiece has not the virtue and has not been created to refine a working man."

M. Mayeux associated himself with the teaching of architecture in schools and the production by the Congress of standard manuals on architecture for the use of public lecturers, while Professor Gilson made appeal for the influence of the Press, by publishing judiciously-written articles on architecture, commenting upon and bringing before the public the qualities and merits of those works which were really worthy of notice.

A PAPER ON THE TOMB OF AGAMEMNON,

or the Treasury of Atreus at Mycenæ, and the reconstruction of its entrance from fragments that have come into the possession of the British Museum, was read before the meeting of the Congress on Friday evening by Dr. Cecil Smith, Keeper of Greek and Roman Antiquities.

ARCHITECTS' REGISTRATION.

"A Statutory Qualification for Architects" was the subject of five papers presented to the Congress at its last meeting on Saturday morning, the authors being Mr. J. S. Archibald (Montreal), M. Louis Bonnier (Paris), M. Gaston Trélat (Paris), Professor Otto Wagner (Austria) and Mr. Robert Walker, of Cork.

Mr. Archibald pointed out that the Province of Quebec Association of Architects was the pioneer (on the western side of the Atlantic at any rate) of statutory qualification for architects, for this law had been founded in 1898 as an amendment to the Association's charter of incorporation. The law reads: "No person can take or make use of the name or title 'Architect,' unless he is recognised under this Act, and is a member of the Association."

M. Bonnier dealt with the diploma granted in France. The campaign, he said, was started as far back as 1840. The Central Society of French Architects took the initiative, and for more than twenty years fought the good fight, until in 1863 M. Eugène Guillaume obtained from the Government the decree instituting the diploma. After a period of modesty and obscurity, during which the first possessors of the diploma, without a bond, without influence, without protection, and treated as intruders, were the objects of attacks as furious as they were stupid, the architects with a diploma formed themselves into an association in 1877. For a great many years they struggled to live—to hold on. Slowly their numbers increased. When they had become 200 the hostilities grew less; and when they had become 500 they were at last recognised. To-day 750 were distributed over France, and in 1912 their number would be 1,000. This striking development and this uncontested prosperity of the diploma in France showed what an imperious want was answered by its creation.

M. Trélat considered that when diplomas were confined to being stimulants to young men to work they were excellent, but they became detestable if they trammelled the free activity of the architect in later life.

Professor Wagner said that if the architect were given a legal authorisation it could not be in respect of his artistic capacity, but only for his professional ability.

Mr. Walker was in favour of registration, and said there was no doubt the trend of opinion was in the direction of securing it.

In the discussion that followed the reading of the papers, Professor Nagy (Budapest) gave a brief account of what had been done by the Society of Hungarian Engineers, Mechanical Engineers and Architects, who now had a Bill before the Hungarian Parliament reserving the right of the title "architect" to those engineers, mechanical engineers and architects possessing proper qualifications from polytechnics or academies.

Mr. Alexander North, on behalf of the Tasmanian Association of Architects, supported registration. He observed that a Bill to that effect had been introduced by his Association in 1891 and again in 1892, but it had been thrown out by the legislature and had not been introduced since. It was satisfactory to note, however, that last year a Chair of Architecture was established at Melbourne University. This, at least, was some official recognition of the claims of architecture.

Mr. Ellis Marsland raised a protest against the subject having been set down for discussion at the same time as an excursion meeting of the Congress had been arranged elsewhere.

Mr. George Hubbard, Mr. Christopher A. Cowper (Royal Victorian Institute of Architects), Mr. G. A. T. Middleton, Mr. David Morgan (Cardiff, South Wales and Monmouthshire Architects' Society) and a representative of the Cape Colony Society of Architects spoke in favour of registration. The chairman (Mr. Edwin T. Hall) pointed out that the diploma granted in France was an honour, and did not restrict anyone from practising as an architect.

The following resolution was passed, only two voting against it:—

That it is desirable in the interests of the public of all nations, and of architecture, that all practitioners should have a statutory qualification.

THE GARDEN FETE.

One of the most successful functions in connection with the Congress was the Garden Fête, held on Wednesday evening in the Royal Botanic Society's grounds in Regent's Park. Mr. and Mrs. Belcher received the guests, numbering 3,000. The grounds were most delightfully illuminated with Chinese lanterns and fairy lights among the trees, music was given by the band of the Royal Horse Guards (Blue) and by a ladies' salon quintet in the conservatory, and a pastoral play, "A Midsummer Night's Dream," excellently acted by Mr. Patrick Kirwan's "Idyllic Players," added to the success of the evening.

FAREWELL DINNER.

The farewell dinner of the Congress was held at the Hotel Cecil on Saturday evening, Mr. John Belcher presiding. Sir William Emerson proposed "The Foreign Delegates," to which toast 14 replies were made, and Mr. Cass Gilbert proposed "The Royal Institute of British Architects," to which toast Mr. Belcher responded. The cover of the menu card was designed by Sir Lawrence Alma-Tadema, R.A.

The next Congress will be held in Vienna.

ARCHITECTURE AND CRAFTSMANSHIP.*

By Reginald Blomfield, A.R.A.

The idea of the architect-craftsman has been much in the air of recent years, and, owing to misunderstandings and some confusion of ideas, a good deal of uncertainty prevails as to the degree in which craftsmanship is necessary to an architect, and to what extent a training in the handicrafts should form part of his education. In this paper I shall endeavour to clear up these points, by tracing the historical development of this idea in modern thought, and by a consideration of the actual function of architecture.

In the earlier days of the Italian Renaissance the architect was almost invariably a craftsman of some sort, or rather it would be more correct to say that, as an artist, he practised architecture among other arts, turning his hand indifferently to architecture, sculpture, or painting. It was not till the middle of the sixteenth century that the architect detached himself from his brethren and specialised in architecture. The result was that inferior men usurped the control of the decorative arts. In France, for example, the architects were utterly routed by Primaticcio. In England, Inigo Jones was the only architect of the seventeenth century who went outside architecture in his remarkable designs for the Court masques; and the last of the Italians who retained the ambidextrous ability of the Renaissance was Bernini, an artist to whom less than justice has been done. As a general rule, by the end of the seventeenth century architects had ceased to trouble themselves with anything beyond their buildings. They practically limited themselves to architectural decoration, and so matters continued till the latter part of the eighteenth century, when architects again took it into their heads to embark on multifarious design. The solid tradition of neo-classic architecture was breaking up, the dilettante was so much interested in the art that he was beginning to lay down the law on architecture, and, for the first time in the history of the art, architecture became a matter of literary fashion. Design was mainly a matter of draughtsmanship without regard to materials, and, having no vitality, died the death it deserved, leaving the way open for all the fads and revivalisms of the nineteenth century.

In England, at any rate, architecture went plunging down the slope of sham mediævalism, with Augustus Welby Pugin leading the way, like the Pied Piper of Hamelin. I would not for a moment underrate the last stand of **the Old Guard.** Men such as Decimus Burton, or, a little later, Barry and Cockerell, maintained the last tradition of architecture as well as they were able in an age of rapidly spreading sentimentalism; and, except for the stand they made, we of to-day should be floundering about in a quagmire of scrap-book fashions, without a clue to any ideal, however remote. Such a clue, faint as it is, they left us, though they failed in the struggle, and English art sank to the lowest depths of degradation it is ever likely to reach at a date fixed for us, with curious irony, by the Great Exhibition of 1851.

Pugin died in 1852. Whether it was his enthusiasm, or the sight of so much accumulated ineptitude at that Exhibition that stirred some latent feeling for better things, it is now difficult to say, but the Exhibition marked a turning-point, and about this time there appeared on the scene that most interesting group of men, **the Pre-Raphaelite Brotherhood.** With the significance of the Pre-Raphaelite movement in regard to painting I am not here concerned, but I would draw attention to the astounding pronouncement of Holman Hunt and Rossetti that "architecture also came within the proper work of a painter, who, learning the principles of construction from Nature herself, would apply them by shaping and decorating the material he had to deal with." I cite this as evidence of the mental attitude of the young men of the movement towards the art of architecture fifty years ago. Mr. Ruskin, not to be left behind in zeal for the reformation of architecture, urged in his "Seven Lamps" that it was useless for an architect to study his art in cities. "Send him," he said, "to our hills, and let him study there what Nature understands by a buttress, and what by a dome." He might, indeed, but it would be something very different to what an architect has to understand by a buttress and a dome. But that would have made no sort of difference to Mr. Ruskin, who ended a prodigious flight of eloquence with a reference to "the old power of architecture," which "gives the Temple gate the depth and darkness of Elijah's Horeb cave." One should perhaps be thankful that he did not throw in Zeba and Salmana as well; for after Mr. Ruskin set the fashion, no one had a chance of getting a hearing on architecture who did not pepper his discourse with abundant references to the Eternal Hills and the pebble-stones by the seashore. That such views would lead to greater knowledge or skill in architecture was improbable; and the art itself ceased to be regarded, except as occasional material for copy.

Ford Madox Brown seems to me, in his strong grasp of the actualities of emotion, to have been the only genuine mediævalist of them all. It was he who inspired the Morris group and was one of the founders of the famous firm.

Morris meanwhile had tried architecture and given it up in disgust, and thereupon, with characteristic energy, had formulated a theory of architecture which boldly cut the knot. Architecture was to voluntarily efface itself, and be content with the part of a vehicle for carving, and ornament, and storeyed tapestry, and beautiful glass. To the achievement of this view Morris devoted half his life, and he adhered to it to the end; and there is no doubt that, as handled by Philip Webb, the realisation of this theory was sometimes beautiful and always profoundly interesting.

The genius of Morris, his personality, his enthusiasm, his lofty integrity of purpose, were irresistible to those who came within his range. We younger men sat willingly at his feet; two architects of ability relinquished architecture for the pursuit of the handicrafts; and in due course the Arts and Crafts Society came into existence. Thus the all-embracing revolution in the arts contemplated by the Pre-Raphaelite Brotherhood had, as the result of the personal temperament of one man, narrowed itself down to a half-despairing championship of the handicrafts—a championship that sought to promote its end by proclaiming the Liberty, Fraternity and Equality of the Arts, and has left us looking each other in the face, with all sorts of pretty things in hand and little or no idea what to do with them. It is out of these conditions and from these intellectual antecedents that the idea of the architect-craftsman has been evolved.

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*Summary of a paper read at the meeting of the Congress on July 18th.

Architecture as a Science and Art.

We were taught in our youth that architecture is both a science and an art. Having little aptitude for science, I can well recollect the alarming vista of scientific study that this suggested. Chemistry, geology, higher mathematics, and so on, all would be necessary before we could hope to master the mysteries of this intractable art, and how was one also to study its forms and perfect oneself in the actual *mécanique* of design? I am not underrating the value of scientific knowledge to architects; we should, all of us, design more boldly if we had full scientific knowledge of statics and dynamics, and could handle the calculus as freely as our T-square; but the fact was that the conception presented by this formidable combination, "science and art," was a mere bogey. Architecture is not a science in the same sense tnat chemistry, botany, or geology is a science. It is bound to recognise the facts and laws of Nature; but, then, so does the art of sculpture in conforming to the facts of anatomy; and the real science of architecture is that knowledge of the effect to be aimed at, and of the means of realising it, which is the hallmark of the competent artist. When enthusiasts and others urge us to study Nature, they are only urging us to beat the air. Possibly they have still in the back of their minds the ingenious theory of forest trees and Gothic vaulting; perhaps they are only repeating a piece of cant. It is only by prolonged and intimate study of buildings—not merely of details, not only of the physical laws which govern construction and the conduct of materials, but by the study and analysis of the effects obtained in noble buildings, and by the search after the principles that govern their disposition—that we can hope to attain to mastery in architecture.

The End of Architecture

is to produce buildings which not only answer their varied purposes as enclosed and covered-in spaces, but also appeal to the æsthetic sense and to the imagination by the beauty and fitness of their forms, by their disciplined design, by rhythmical combinations which appeal to some such instinct within us as is touched by great orchestral music.

Now, this aspect of architecture is one that seems to have dropped out of view in the last 50 years or so. It formed no part of the Gothic Revival—a Revival that concerned itself almost entirely with details, cusps and crockets, mouldings and tracery, tiles and vestments, and all the other knicknacks and gewgaws of that preposterous anachronism. Neither did it occur to the Pre-Raphaelite Brotherhood or their successors. Morris did, indeed, attack detail in genuine earnest; but the view of architecture as the architectonic art, the art that controls and orders the crafts, was not compatible with the socialistic ideal of art; and it was only the logical, if unconscious, result of that ideal that this view should be repudiated, that in its place we should be offered the noble army of craftsmen, all tumbling over each other in their haste to invest our ineffectual efforts with artistic merit. I cannot think the results have justified the enthusiasm of 20 or 30 years ago. Hell, they say, is paved with good intentions; so is much of our modern decorative art in England, work done with laudable zeal, but with inadequate technique. Amongst other things, we find "Art Nouveau" confronting us as a monstrous result of mere craftsmanship divorced from architecture. The socialistic ideal of art, the ideal of unalloyed craftsmanship, has been tried and found wanting. The future, in architecture at any rate, is not with the socialist, but with the individual master-mind.

Knowledge of Materials.

The architect must be acquainted with his materials, and as a student should see actual bricks being laid, actual masonry set out and worked, and the essential methods of lead, steel and iron work in operation: but it is of the first importance that the student should keep steadily before him the end in view. He is not there to qualify himself as a bricklayer, or a plumber, or whatever it may be, but in order that he may learn to know his way about among those crafts when he himself comes to deal with buildings.

All, therefore, we can hope to do in the training we offer to our students is to lay a good foundation, to familiarise them with the use of their tools and materials, and to give them some insight into the means available for architectural expression. In doing so it is essential to keep before the student the ultimate end of all this training—namely, skill, not in draughtsmanship nor in craftsmanship, but in architecture. It is because this point of view has been lost sight of in the cross-currents of thought of the last fifty years that I have ventured to criticise the distinguished men to whom I have referred in this paper.

No one can be more sensible than I am of all that we owe to the genius of William Morris, and, indeed, to the ability and enthusiasm of the younger generation who started the Arts and Crafts Society. But the unintentional effect of that movement has been to substitute craftsmanship for architecture, and to allow architecture to exist only on the sufferance accorded to the man who blows the bellows.

THE RELATION OF MODERN ARCHITECTURE TO CRAFTSMANSHIP.*

By W. R. Lethaby.

The forms which run so readily from the point of an architect's pencil are decayed and degraded memories of the discoveries once made by ancient craftsmen. Whence, then, is new energy in modern architecture to be derived? In part it may come from the investigations of science applied to the solution of the compelling forces of civilisation; but we want a vital and resourceful craftsmanship which shall be able to deal with such new ideas and interpret them in proper terms. As at present conducted, however, the profession of architecture is shut away almost completely from any direct relation with workmanship. Some of our most gifted architects, feeling the workmanlike interest of old architecture, but perhaps understanding its source incompletely, have tried to give their buildings the *appearance* of interested handiwork and masterly ease; they have designed roughnesses and even accidents; they have tried to bring back the semblance of old ways of doing things; but such a procedure is but one more partition between us and the veracities of art, and one more burden to the labour thus called in to parody labour.

A work of architecture must be as real as a ship—that is, shaped by the primal facts of existence.

Contact with labour may mean several things besides the one that we have now to consider. We need, for instance, to be in closer touch with the executants of our buildings, and to be anxious to learn from them what *they*, the artists, think is good work, and what improvements of method they can suggest. I am sure we need to open out a way for promotion from the ranks; we need to arouse an interest right down through the whole body of those engaged in building; and we must recognise that at present, so far as the initiation of art is concerned, modern architecture is the result of practically servile labour, and necessarily bears that mark.

In the second place, contact with craftsmanship may mean the acceptance by the scientifically-trained directing architect of the help of independent expert assistance from workmen of a high order—painters, sculptors, metalworkers, modellers, and the like—and the sloughing-off of the ordinary wrappings, shrouds even, of office-designed ornamentation. It will, I think, be necessary to come to some sort of Home Rule in the arts associated with architecture, so that a metalworker shall be responsible for the design of metalwork, and a glazier for glass, as well as a painter for paintings, and a sculptor for sculpture. It is as absurd for an architect to design ornamental metalwork as it would be for him to design oil paintings to be carried out by hireling labour.

To come to our immediate subject—"How far should the architect receive the theoretical and practical training of a craftsman?"—the idea underlying this enquiry is, I have found, liable to misinterpretation in at least two ways. It is laughed at as a mere whim, as though it were proposed that the architect should make his own mortar and lay his own bricks; or, secondly, it is received as a sort of new gospel, and then immediately the initiate is likely to show his interest in craftsmanship by taking up enamelling, gesso-work, or wood-carving.

The craftsmanship I have in view is a course of workshop training in masonry and carpentry, so long as they remain the principal factors in construction. So understood, craftsmanship should form the basis of architectural education. However desirable it may be to train some men to the highest degree of academical skill, administrative ability and draughtsmanship who may be able to deal with the complicated problems of practice in a big city, it must be remembered that a far vaster volume of building work consists of tasks of a humbler nature, tasks which a highly-trained expert is too refined to deal with satisfactorily. Such works need the intimate handling of those who perhaps have rougher faculties. I hold it for certain that the more we elaborate (and possibly of necessity elaborate) the education of architects who are to practise in large cities, the more we are making it difficult to supply the everyday needs of the country. I see, then, in a basis of craftsmanship not only a necessary part of the education of all who are to be architects, but a way of opening out channels for diversities of gifts which may correspond with the diversities of requirement.

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* Summary of a paper read at the meeting of the Congress on July 18th.

Notes and News

New Cattle Markets and Slaughter-house for Edinburgh are proposed to be erected at Gorgie from plans prepared by the City Superintendent of Works.

The Aberdeen Architectural Association, under Mr. G. G. Irvine, the president, recently paid a visit to the Strabathie works of the Seaton Brick and Tile Co.

Liverpool Cathedral : the Chapter-House.—On Tuesday, last week, the Duke of Connaught laid the corner-stone of the chapter-house of Liverpool Cathedral.

Messrs. Roger Smith & Son, of 130, Temple Chambers, Whitefriars, E.C., have taken into partnership Mr. Harold E. Church, A.R.I.B.A., as from July 1st.

A Working Men's Institute at Gorseinon has been erected from designs by Mr. Ruthen, of Swansea. Mr. G. Mercer, of Llanelly, was the builder.

A large portion of the ceiling of Dungan Catholic Church, county Roscommon, collapsed recently, injuring about forty people. The church has only lately been erected.

A Booklet on "The Natural Ventilation of Churches" has recently been issued by the well-known firm of ventilating engineers, Messrs. Robert Boyle & Son, of High Holborn.

A New Free Library at Northampton, for which Mr. Carnegie has given £15,000, is to be erected in accordance with plans prepared by Mr. Fidler, Borough Engineer and Surveyor.

Restoration of Carnarvon Castle.—The Office of Works has been instructed to send its architect to Carnarvon to confer with Sir John Puleston, custodian of the castle, with a view to a more ample restoration of the old edifice.

Cracks in the Vatican.—Many of the walls of the Vatican, at Rome, are cracked and bulging, owing to the weight put upon them in the course of centuries of internal alterations, and it is estimated that restorations costing £20,000 will have to be carried out at once.

House of Commons Ventilation.—A White Paper on the ventilation of the Houses of Parliament has just been issued. Numerous recommendations of detail are made, including one for the alteration of the position of the cotton-wool intake on the terrace side.

Lambeth Municipal Buildings.—On Saturday last Alderman Powell, J.P., F.R.I.B.A., mayor of Lambeth, laid the foundation stone of the new municipal buildings to be erected at the junction of Brixton Hill and Acre Lane. The architects are Messrs. Warwick & Hall.

The Lewisham Borough Council have under consideration a scheme for erecting workmen's dwellings on four and a half acres of land at Lee. The total estimated capital charge will be £29,130, made up as follows :—35 houses at £250 each, 35 houses at £400 each, four and a half acres of land at £1,000 per acre, road and sewer expenses £1,870.

Birmingham Lying-in Home.—A central home in Loveday Street in connection with the Birmingham Lying-in Charity is being erected to provide a building in which pupil midwives may complete their training, and where those maternity cases can be received which are so serious as to need special treatment. It will provide accommodation for 16 patients and the necessary staff. The total estimated cost is £12,500.

A Wesleyan Mission Hall and School is in course of erection at Lytham, at a cost of £3,000. Mr. Herbert Wade, of 27, Birley Street, Blackpool and Mr. Walter Wade, of Bank Chambers, St. Annes, are the joint architects. Mr. H. Mogridge, of Lytham, has secured the general contract; and Messrs. Saunders and Taylor, of Manchester, will carry out the heating and ventilating arrangements.

Irish International Exhibition, 1907.—The buildings of this exhibition, which is to be held in Dublin next summer, have been designed by Messrs. Kaye-Parry & Ross, architects, of Dublin, and are being erected by Messrs. Humphreys, Ltd., of London. The main building will comprise a central octagonal court 215ft. in diameter surrounded by a corridor opening into four radial wings, each 164ft. long by 80ft. wide. Over the court will be an octagonal dome 80ft. in diameter and 150ft. high. Around this main building will be grouped a number of pavilions—machinery pavilion, concert hall and restaurant, art gallery, &c.

Messrs. Mellowes & Co., Ltd., of Corporation Street, Sheffield, have secured the orders for glazing, on their "Eclipse" patent imperishable system, the roofs of the extensions to the works of Messrs. Cammell, Laird & Co., Ltd., Sheffield; Cadbury Bros., Ltd., Birmingham; Tranmere Bay Development Co., Ltd., Birkenhead; Crawford's Biscuit Works, Leith; Kitson & Co., Ltd., Leeds; Redpath, Brown & Co., Ltd., Manchester; Coventry Ordnance Works, Coventry and Glasgow. Also export orders for Holland and South Africa.

Birmingham Post Office : Proposed Extension.—A Bill is now before Parliament to acquire land in Paradise Street, Birmingham, and to take the old post office (now occupied by the Inland Revenue authorities) for the purposes of additional postal accommodation. The Post Office authorities have acquired the whole of the land between the Inland Revenue Office and Queen's College, as well as a site in the rear. Nearly three years must elapse before all the leases expire, and then, if not before, it is anticipated that a commencement will be made upon the extension scheme. It is not likely that it will be necessary to interfere with the exterior of the old post office; but there will be a complete rearrangement of the interior. A huge subway will be constructed under Hill Street connecting the two buildings.

Strand Improvement Scheme Rejected.—The Improvements Committee of the London County Council have reported that they are unable to recommend the suggestions for altering the northern frontage of the Strand put forward by Mr. Hamo Thornycroft, R.A., the Further Strand Improvement Committee, and the Royal Institute of British Architects. They state that after the most anxious consideration of the matter they feel "that the Council would not be justified in incurring so large an expenditure as would be involved in securing a doubtful enhancement of the architectural view in the Strand. Having regard to the great width already provided (100ft.), it will be possible to secure under the Council's scheme an imposing effect for the buildings to be erected on the northern side of the Strand."

Correspondence.

Finchley Cottage Hospital.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—We should not have intervened in this matter had it not been for the remarkable editorial which you append to Mr. Bacon's letter. In the first place, whatever your views may be as to the necessity for isolation wards in connection with a cottage hospital, the conditions of the competition required certain definite provision for isolation, the purpose of which was further elucidated in answer to a question which we ourselves put to the secretary. It was, therefore, not open to any of the competitors to provide wards obviously unsuited for the purpose of isolation and to explain that they could be used for paying patients. Such a suggestion is quite *ultra vires*, and for this reason alone the plan is clearly disqualified.

We do not wish to enter into any controversy as to the relative merits of the designs, whatever may be our own feelings on the matter (and we have suffered much from incompetent assessors in the past). In entering the competition we submitted to the judgment of the three assessors and we must abide by the result, but we would remark in reference to your statement that isolation wards should have no place in a cottage hospital that this is a view which would be upheld by no one conversant with the needs of an institution of this kind. Some provision for the isolation of infectious cases is an absolute necessity in the very smallest cottage hospital. It is within the knowledge of anyone who is at all familiar with the working of similar institutions that cases do and must arise which cannot be removed to an isolation hospital; and, furthermore, that the contingency must be provided against of the only available isolation hospital being full.—Yours truly,

LONDON, W.C. YOUNG & HALL.

[We still maintain that isolation wards are not necessary in a cottage hospital. If a case occurred which required isolation it would be at once removed to the nearest hospital for infectious diseases. In the contingency of this latter being full, the isolation wards in the scheme in question would still be available—if not otherwise occupied—without detriment to the access to the extension, for they have been planned with an air disconnection from the main corridor in the form of a ventilated lobby. The term "isolation ward" in a hospital of this class is a misnomer; separation ward would be more correct.—ED. B. J.]

Pecksniff's Defence.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—The arguments (?) of the superior person who hides his identity under the title of "Pecksniff Minor" are sufficiently silly to carry their own refutation. Personally I have no objection to admitting a middle-class admiration for the works of Charles Dickens, but can a gentleman (a member of the aristocracy, I presume) who practises architecture as a "trade" afford to throw mud at we inferior people who endeavour, however unsuccessfully, to practise it as an art? As to the efficacy or otherwise of registration, there are thieves in spite of policemen. Being a tradesman, this "Pecksniff Minor" thinks only of the money to be made out of his trade (there are instances of considerable fortunes being made by architects proper), and it would, of course, be mere waste of time to try to convince such an one that other ideals actuate other men and induce in them a desire to sign their own work as they do their letters to the Press.—Yours truly,

SIDMOUTH. R. W. SAMPSON.

Unsatisfactory Competitions at Tyneside.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—Unsatisfactory competitions in the Tyneside district appear to be epidemic, the latest being the Tynemouth Education Committee's proposed school in Preston Avenue. The facts are:—The Education Committee invited 12 architects to submit designs for a new school to accommodate 1,300 children. A professional assessor (Mr. R. J. Leeson) was appointed, and his duties, according to the condtions, were to select the designs first, second and third in order of merit, and to report to the committee. This was done, with the result that the plans marked "H" were awarded first place, those marked "J" second place, and those marked "G" third place. A committee of three members, consisting of two builders and one house-agent, was then appointed to look over the plans and report to the General Committee. They proposed that the order of the award should be altered—namely, "G" first, "H" second, and "J" third. This proposal the General Committee did not agree to (all honour to them), but they adjourned the meeting until early in September so as to enable the assessor to attend.

There are evidently some influences at work to get the award altered, and the attendance of the assessor has, no doubt, been suggested with a view to either getting him to acknowledge his inability to judge plans or to persuade him that the two builders and one house-agent know more about schools than he does. It will be very interesting to watch the result of this comedy, as the hon. secretary of the Northern Architectural Association, Mr. A. B. Plummer, F.R.I.B.A., is one of the committee, and there is also the Mayor, Alderman J. P. Spencer, an architect, on the committee; likewise two clergymen and three or four builders, besides other well-known gentlemen and one lady.

No doubt the local Architectural Association, under the able guidance of the president, Mr. J. T. Cackett, F.R.I.B.A., will move in the matter, and it would do no harm if the London Institute lent its aid.—Yours truly, "UNION."

Notes on Competitions

Finchley Cottage Hospital.

Our comments upon this competition, which appeared in our issue of July 4th, appear to have irritated the chairman of the Finchley District Council, who presided at a meeting of subscribers to the Finchley Cottage Hospital Fund recently. The chairman is Mr. E. A. Woodrow, F.R.I.B.A., and it was he who formed one of a sub-committee of three which was appointed to report upon the designs, the other members being, respectively, a doctor and a late secretary of Bartholomew's Hospital. We stated, in respect of the award—which we considered unsatisfactory—that "it is but fair to assume that the medical view has out-balanced the architectural one." On account of this remark the chairman complains that he has been accused, by a trade journal, of being coerced by his medical colleagues, and he goes on to state that "in self-defence he must tell them (the subscribers) that he visited the room in which the plans were hung every morning for a week and he spent an afternoon there as well. Then he wrote his report and his decision, and, shortly afterwards, met his colleagues on the selection committee, who had, like him, individually and alone, made their selections. And all three selections were the same." We felt so strongly that neither the best design had been selected, nor even the second best, that we could not conceive of an architect member of an assessing committee taking any other view than ours, and that is why we arrived at the charitable assumption that the medical opinion had outweighed the architectural; we certainly never hinted at coercion. Well, we are profoundly regretful that we were wrong. Mr. Woodrow further remarked, "He did not care a button what *The Builders' Journal* said, but he did care very much what subscribers thought. The article was obviously an inspired one, inspired by an unsuccessful competitor, as shown by extracts from a private letter sent to him." Now we must disclaim most emphatically that our article was inspired. We always endeavour that a representative shall attend exhibitions of competition designs, and Finchley was visited in the ordinary course. The comments which we published were made according to conviction and without bias. The extracts from a private letter sent by a competitor to the Hospital Committee were obtained through enquiry after the criticisms upon the award had been written.

Competition for London County Hall.

The announcement will be read with pleasure that the Establishment Committee of the London County Council recommend the holding of a double competition for the new County Hall to be built on the south side of the Thames, next to Westminster Bridge. A communication was made to the Council by the Institute expressing a hope that it might have the privilege of advising the Council in the matter of securing designs for this important building in which "an exceptional opportunity will occur of realising the educational value of the art of architecture and of fostering the arts and crafts of the day." The Establishment Committee expressed their willingness to consider any suggestions which the Institute might make, and subsequently the Institute expressed the opinion that the only way of securing such a result as the Council naturally desired was to obtain, "by some means or other, a strongly individualised personality to deal with the problem under properly defined conditions," and the Institute suggested that the method most likely to achieve that result would be to institute a competition. In support of this view they called attention to the fact that the designs for the Houses of Parliament and the Foreign Office in London, the Hotel de Ville, the Opera House and the Palaces of Art in Paris, the Houses of Parliament in Berlin, and the Central Library in New York, were all selected in competition. The Institute recommended the holding of a preliminary and a final competition, and suggested that some of the leading architects should be invited to compete in the final stage. The Establishment Committee, having given careful consideration to the various suggestions, accepted the proposal of a double competition, the preliminary one to be open to architects of any nationality, "and that not less than 10 and not more than 15 of the best designs shall be selected in private by assessors"; the final stage to be open to "(1) the authors of the designs selected by the assessors in the preliminary stage, and (2) not exceeding eight leading architects to be invited by the Council to send in designs before the expiry of the period within which designs must be sent in for the preliminary competition." The Committee think there should be two assessors for the preliminary competition and three for the final, and that Mr. W. E. Riley, the Council's architect, and Mr. Norman Shaw, R.A., should be nominated to act in both stages, and that the competitors in the final stage should vote for the third assessor, who will only act in that stage. The committee suggest that each of the competitors in the final competition should be paid a fee of 200 guineas. Next week they will report as to the remuneration of the assessors, and also as to the date by which the designs should be sent in. It is suggested that the Council's architect should prepare detailed particulars of the accommodation required, and the committee propose to make it a condition that the successful competitor, if appointed, shall collaborate with the Council's official architect, "who should have discretionary power in all matters relating to the internal economy and construction of the building."

Central Public Library, St. Pancras.

The result of this competition will be made known to-night at the meeting of the Borough Council. A public exhibition of the drawings will be held at the St. Pancras Town Hall on Thursday, 26th, and Friday, 27th insts., from 9 a.m. to 3 p.m., and on Saturday, 28th inst., from 9 a.m. to 1 p.m. The competitors are Mr. Maurice B. Adams, Messrs. Cross & Mallows, Mr. J. S. Gibson, Messrs. Russell & Cooper, Messrs. Wills & Anderson, Mr. E. W. Wimperis. The assessor is Mr. John Belcher, President R.I.B.A. The designs were sent in on June 15th last, and the estimated cost of the building is £20,000.

Joint Isolation Hospital, Stone.

In the competition for a joint isolation hospital to be built at Stone, Staffordshire, limited to architects in the district, the design of Mr. J. J. Chapman, of Stone, has been placed first by the assessor, Mr. William A. Pite, F.R.I.B.A., whose award has been adopted. There were four other competitors.

Competitions Open.

The following is a list of competitions open:—

DATE OF DELIVERY		COMPETITION.
July	28	BATHS AT PRIMROSE MEADOWS, SHEFFIELD. Limited to Sheffield architects. Premiums of £30, £20 and £10. Particulars from Town Clerk.
Sept.	20	SCHOOL AT SUNDERLAND. Limited to local architects. Premiums of £50, £20 and £10. Particulars from John W. Moncur, borough engineer, Town Hall, Sunderland.
Sept.	28	SEWAGE DISPOSAL SCHEME FOR ELLESMERE. Premium of £20. Particulars from R. E. Lloyd, Clerk to Urban District Council, Ellesmere.
Sept.	29	REBUILDING OF HENSHAW'S BLIND ASYLUM AT MANCHESTER. Limited to Manchester architects. Premiums £100, £50, and £25. Assessor, Mr. John Holden, F.R.I.B.A.
Oct.	1	ALPHABET COMPETITION. Prizes of £20, £10 and £5. For particulars see "Architectural Review."

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Supplement to
The Builders' Journal and Architectural Engineer,
Wednesday, July 25th, 1906.

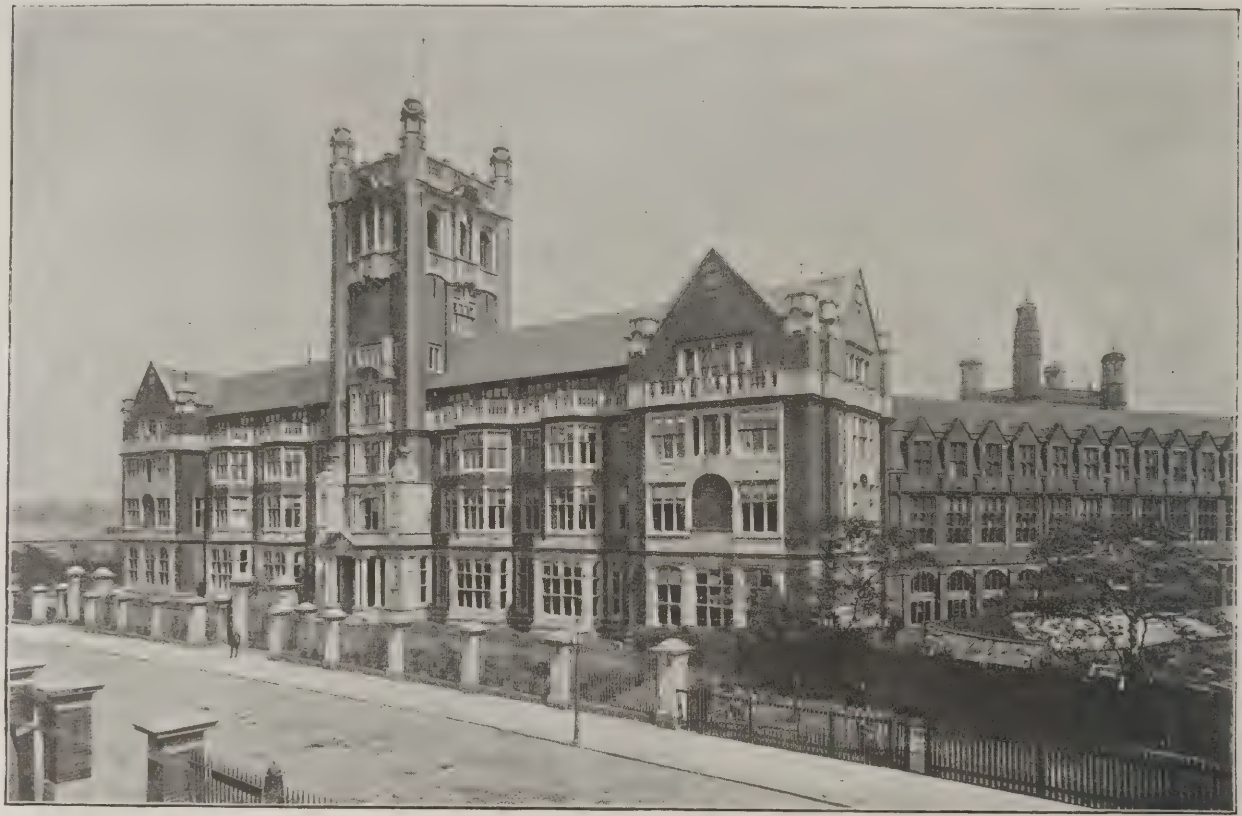
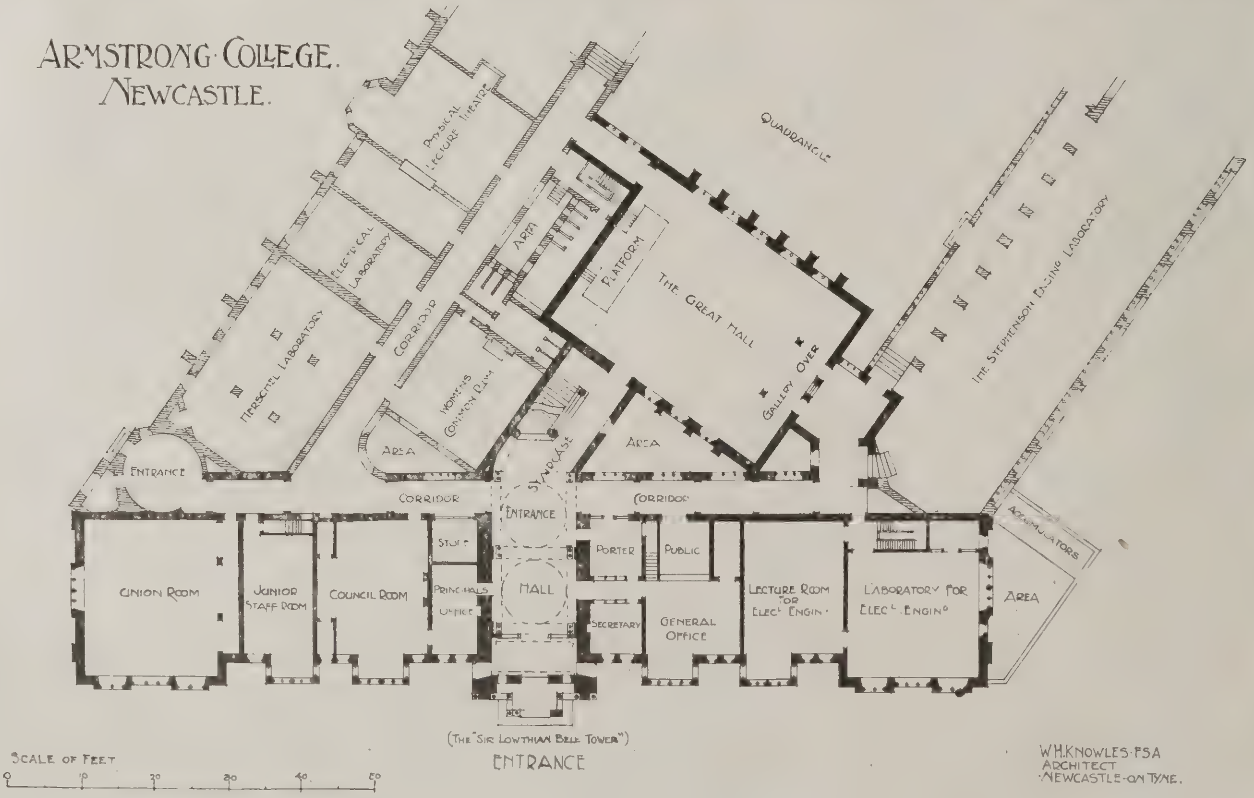


Photo: J. Bacon & Sons.

ARMSTRONG COLLEGE. NEWCASTLE.



W. H. Knowles, F.S.A.
Architect
Newcastle-on-Tyne.

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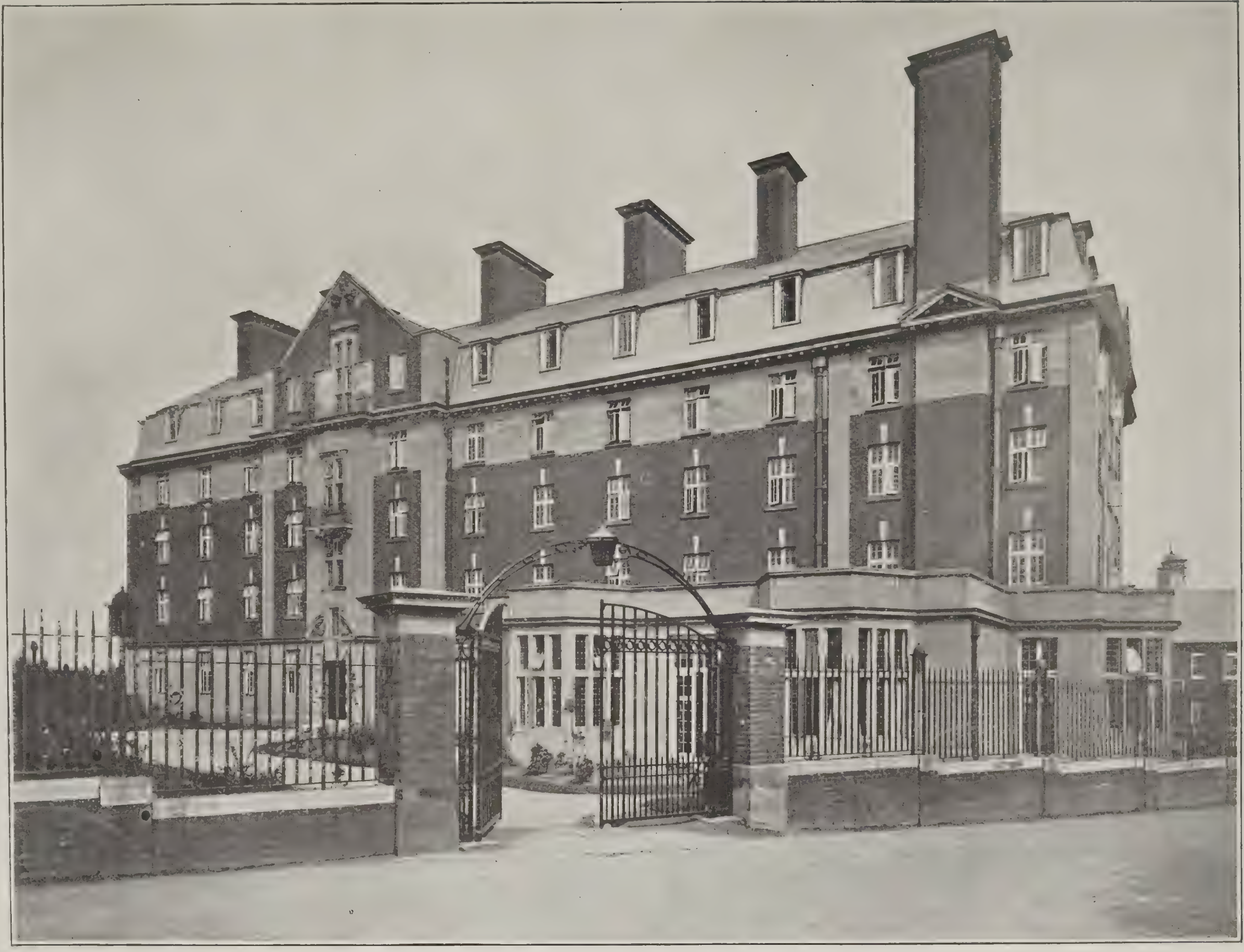

ROYAL VICTORIA INFIRMARY, NEWCASTLE-ON-TYNE: THE NURSES' HOME.
H, PERÇY ADAMS, F.R.I.B.A., AND W. LISTER NEWCOMBE, F.R.I.B.A., JOINT ARCHITECTS,

Photo: T. Lewis,

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R.I.B.A. EXAMINATIONS.

Model Answers by A. G. Bond, B.A., A.R.I.B.A.

The Intermediate Examination.

(*June 12th*, 1906.)

Subject III.—THE ORDERS OF GREEK AND ROMAN ARCHITECTURE: THEIR ORIGIN, DEVELOPMENT AND APPLICATION.

[*Time of examination, one hour and a half. The first two questions to be attempted, and not more than two others. Maximum number of marks* 50.]

1. *Draw a section through a Greek Doric and another through a Roman Doric entablature, each 4ft. high, to one-eighth full size, naming the principal parts and members. State the height in feet you would allow to the supporting column in each case.*

The sketches give the two sections required and the principal parts are named thereon, but owing to the reduction in scale the heights of the columns may be stated as approximately three times that of the entablature in the case of the Greek example and four times in the case of the Roman example.

2. *Sketch to scale, as large as the paper will allow, an example of a Roman triumphal arch. The composition and proportions of the principal parts to be clearly shown, but detail is not required.*

See illustration.

3. *Is there any difference of treatment proper o a pilaster in the Greek and Roman styles? Illustrate an example in each style.*

Pilasters were called "antæ" by the Romans and "parastatæ" by the Greeks, the latter word implying their usual position, as "standing against" another member. As a matter of fact, they are almost in all cases "engaged," or part of the wall behind, in both styles, the chief difference in treatment being that the Greeks formed their pilasters of the same width at bottom and top, and with capitals and bases different from those of the Order with which they were used, whereas in Roman work it is usual to find the same treatment applied to both, including the upward diminution. Good examples illustrating these differences may be found in the Erectheum (see sketch). The triumphal arch illustrating question 2 shows the usual form of the Roman Corinthian pilaster.

4. *Describe and illustrate by sketches the method in which the Orders were generally used in the domestic buildings of the Romans.*

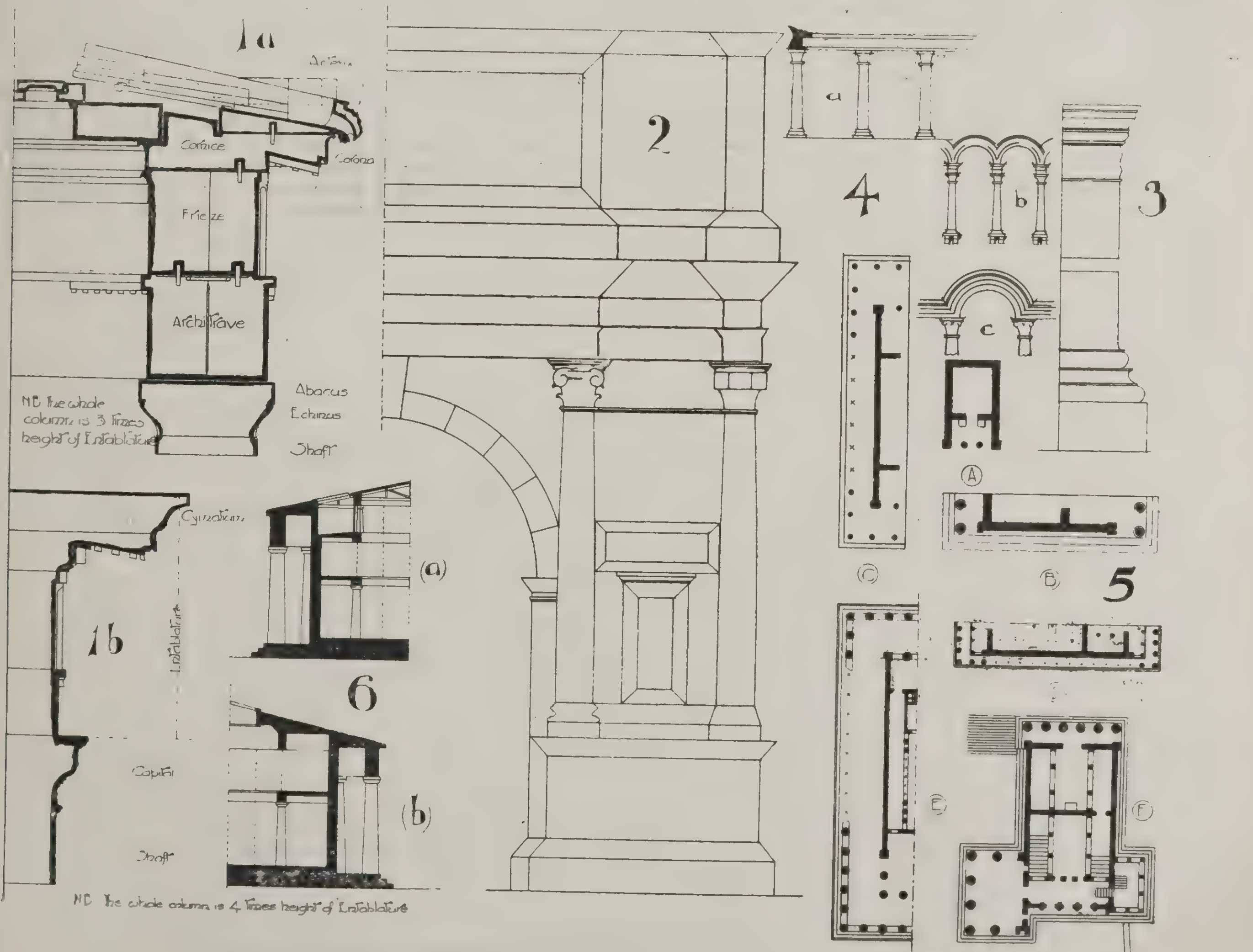
The two principal sources of information from which we can answer this question are:—(1) The Palaces of the Roman Emperors, of which, perhaps, that of Diocletian at Spalato affords the most striking variations from the normal use of the Orders, and (2) the remains of private houses at Pompeii, in which the most common variation is the use, in the "peristyle," of columns supporting a roof by means of a simple beam without the usual entablature. In the sketch-diagrams given to illustrate these variations, that marked (*a*) refers to the use in the peristyle and those marked (*b*) and (*c*) are from the palace of Diocletian. The latter indicate respectively the use of subordinate Orders with wall arcades standing on corbels, and having a fragment of the entablature returned upon itself over each abacus, and, secondly, the use of an arch with mouldings of the same contour as the entablature mitred and turned to spring from the abacus of the capital.

5. *Describe as briefly as possible the various forms of plan of the Greek temples, from the simplest to the most elaborate.*

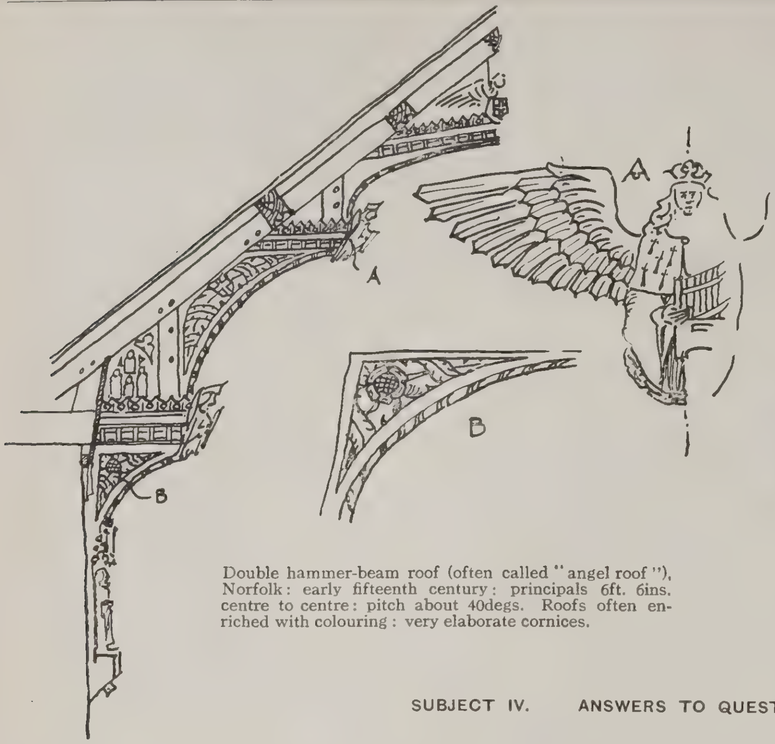
The plans of Greek temples are generally classified according to the number of columns carrying the pediment, and by the method of carrying the entablature along the periptery, and the use or non-use of a rear portico or posticum. Thus, of the examples illustrated, (*a*) is called distyle in antis (having no prostyle, or projecting portico—if it had a similar portico at the other end it would be called amphi-distyle in antis). The next in order of size (*b*) was the temple with projecting porticoes carried by four columns—amphi-prostyle, tetrastyle: (*c*) is an example of the next development, the addition of a "periptery" involving the use of at least six columns in front—peripteral hexastyle: while (*d*) differs from the last in having eight columns in front—octastyle, but still only "peripteral" (an octastyle temple might logically be expected to have two rows of columns round the cella and so become "dipteral"). The plan marked (*e*) is pseudo-dipteral octastyle; it is of the size and general form of a dipteral temple, but the inner peristyle is omitted, leaving a wide space or ambulatory. (*f*) shows an example of irregular planning, being a combination of three temples.

6. *How were the Greek temples lighted?*

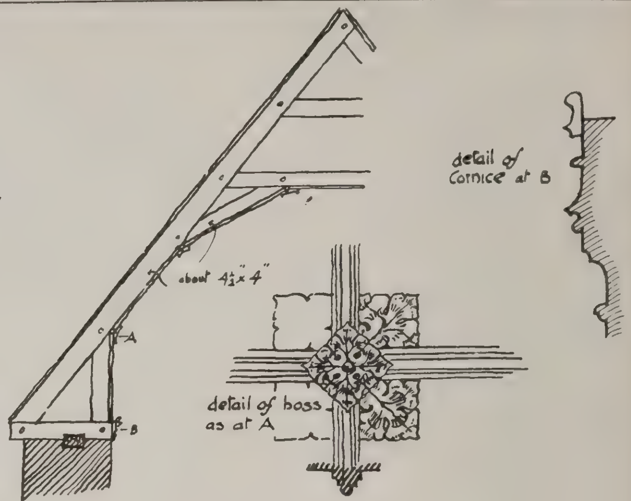
The illustrations show two of the most


1a
Cornice
Corona
Frieze
Architrave
Abacus
Echinus
Shaft
NB The whole column is 3 times height of Entablature
2
4
a
b
c
3
1b
Cymatium
Entablature
Capital
Shaft
NB The whole column is 4 times height of Entablature
6
(a)
(b)
5
A
B
C
E
F

R.I.B.A. INTERMEDIATE EXAMINATION. SUBJECT III. ANSWERS TO QUESTIONS 1—6.

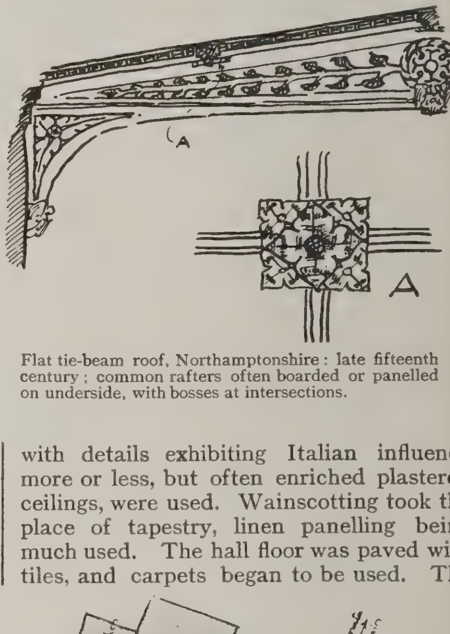


Double hammer-beam roof (often called "angel roof"), Norfolk: early fifteenth century: principals 6ft. 6ins. centre to centre: pitch about 40degs. Roofs often enriched with colouring: very elaborate cornices.



Trussed rafter roof, Norfolk: early fourteenth century: without principals: rafters about 1ft. 9ins. centre to centre: pitch about 50degs. Roofs often quite open (*i.e.*, not boarded or panelled).

SUBJECT IV. ANSWERS TO QUESTION 1.



Flat tie-beam roof, Northamptonshire: late fifteenth century; common rafters often boarded or panelled on underside, with bosses at intersections.

important theories which have been put forward in reference to the method of lighting probably employed. In the sketch sections *(a)* is Fergusson's theory—the clear-story system, and *(b)* is Bötticher's theory—the skylight system. Temples dedicated to Zeus were probably hypaethral, or open to the sky, and hence needed no other means of lighting. Other means which have been suggested are (1) by the doorways, (2) by means of translucent marble tiles, and (3) by artificial means. Certainly windows were quite the exception, though they occur at Agrigentum, in the great temple of Zeus, and in the Erectheum.

Subject IV.—OUTLINES OF THE HISTORY OF MEDIÆVAL AND RENAISSANCE ARCHITECTURE IN EUROPE.

[*Time of examination, one hour and a half. Not more than four questions to be attempted. Maximum number of marks* 75.]

1. *Describe and illustrate by rough sketches three types of open timber roofs which prevailed during the mediæval period, and assign approximate date and locality to each.*

See illustrations.

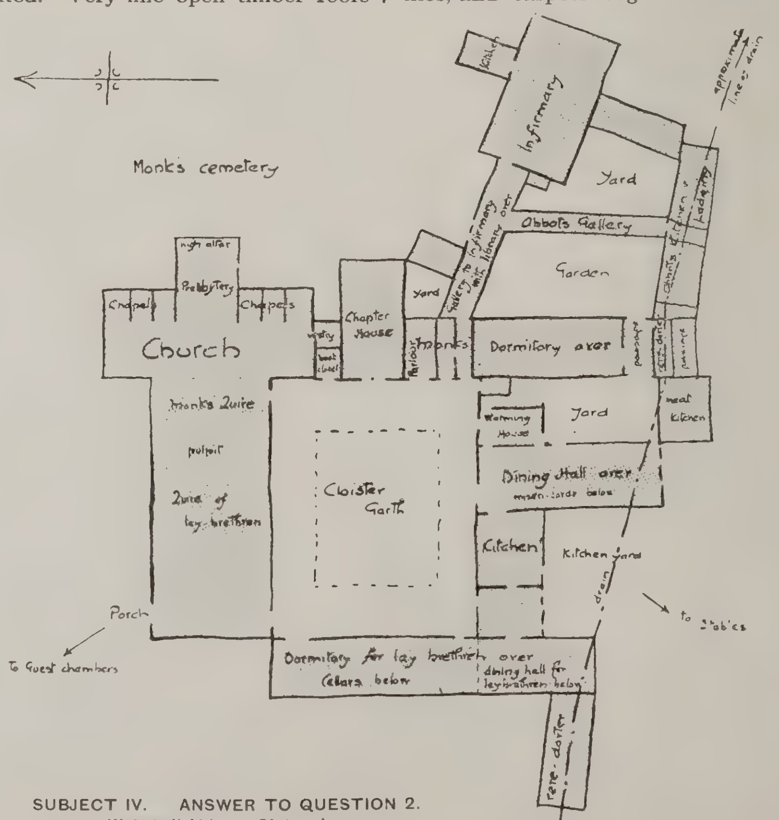
2. *Give a clear outline plan of some famous English monastic building (including its church). Mark on the plan the names of the parts or buildings, and explain briefly their several purposes, or uses.*

See sketch plan of Kirkstall Abbey.

NOTE: In answering this question the student would of course give the example with which he was most familiar. Perhaps the conventual buildings around Westminster Abbey would be the example generally selected, and it is a very typical one.

3. *Give a brief account of the condition and characteristics of English domestic architecture in the first half of the sixteenth century.*

Many castles were built in this period. The fortified character gradually disappeared and they may more strictly now be called mansions. Examples are Compton Wynyate house, Warwickshire; Hengrave Hall, Suffolk; and Thornbury Castle, Gloucestershire. In these examples, as in the colleges of this period, the quadrangle is the governing feature of the plan. Many of the colleges of Oxford and Cambridge are fine examples of this style—Magdalene and Brasenose and Corpus Christi, Oxford, may be mentioned; also many "hospitals" which were founded during this period, as, for instance, Ford's Hospital at Coventry, and the Inns, such as that at Glastonbury. The market cross at Glastonbury is also an interesting example of the period. After the time of Henry VII. many Italian features were introduced, and the influences discussed in the answer to question 4 began to be felt very strongly. The characteristics of the domestic work of this period may be summarised as follows: Fireplaces took the place of the central hearth with louvre in roof above. Ceilings of bay windows and other recesses were fan vaulted. Very fine open timber roofs with details exhibiting Italian influence more or less, but often enriched plastered ceilings, were used. Wainscotting took the place of tapestry, linen panelling being much used. The hall floor was paved with tiles, and carpets began to be used. The



SUBJECT IV. ANSWER TO QUESTION 2.
Kirkstall Abbey—Cistercian.

custom of sleeping in the hall was discontinued and numerous small sleeping chambers were provided. The solar increased in importance and was called the with-drawing room. Stained glass was used in the hall and principal apartments. A good many half-timbered houses were built. Gatehouses were treated as a most important feature. Brickwork and terra-cotta were employed as well as stone, especially in the Eastern Counties.

4. *Describe in what ways English architecture was affected by the movement known as the Renaissance.*

Architecture in England was very gradually affected by the Renaissance movement, which made itself felt first at the beginning of the sixteenth century in minor features in tombs and chantries and in the detail of larger buildings, ultimately affecting the whole design. The change of thought was not favourable to church building, but the richest of the new nobility encouraged a taste for grandeur and dignity in outward life that required great houses for its display. It is therefore in the great mansions that the conflict of the styles is best illustrated. At Hampton Court, at Layer Marney tower, and in some degree at Compton Wynyates and Hengrave, Italian influence is seen in the ornament, but at Nonsuch Place, built by Henry VIII., it was much more in evidence. Not until Kirby Hall do we get any drastic alteration in the plan. Here the entrance gateway and screens are on axial line and the inner court quite symmetrically treated. An entirely symmetrical plan for the whole building was originally intended by John Thorpe. The tendency was always towards symmetry, even at the cost of convenience. The hall decreased in importance as the staircase and other apartments increased. At first classical features were very much modified, and were used in conjunction with mullioned windows and stepped gables and parapets and chimneys full of Gothic feeling, ornamented with scroll and strap work, but at the begining of the seventeenth century Inigo Jones, who had studied in Italy, followed Palladio very closely; later the designs of Christopher Wren, who was given almost a free hand in London after the Great Fire, exhibiting as they did a most practical and common-sense treatment of the Renaissance style, had a very powerful and lasting effect on English architecture, and not until long after his death, when architecture had become a mere pedantic copyism of foreign work, did a reaction take place known as the Gothic Revival, which permanently affected church work only. Even to the present day the influence of Jones and Wren is to be traced in much modern work.

5. *By what influence was the rise of Renaissance architecture in Italy affected? In what respects do Florentine, Venetian and Roman Renaissance work differ the one from the others?*

Gothic architecture never became really nationalised in Italy, even in the parts nearest German and French influence, and the Gothic buildings there are poor in comparison with those of Northern Europe. Classic forms were those in which the Italians naturally expressed themselves, and they at once returned to them when the great revival of the arts in the fifteenth century and the prosperity of the large Italian cities created a demand for palaces and churches. A style of architecture was developed in which old forms were used in new ways, and which became known as the Renaissance style. The fall of Constantinople in 1453 flooded Italy with Greek scholars, and the discovery of a new world by Columbus and Cabot had a stimulating effect. The invention of printing disseminated the knowledge thus acquired. The movement in art combined faultless construction to extraordinary fertility of design. Italy was the centre of the upheaval. The study of old examples was soon reduced to mere methods of design, and architecture became the capacity to clothe the new buildings with old forms. The work in Florence, Venice and Rome may be compared in the following way:—

Florentine.	Venetian.	Roman.
Early. Solidity and simplicity. Rusticated masonry. Small windows on ground floor. Great main cornice. No use of Orders, or very little, Mouldings elegant, refined, but small. *Late.* Greater use of classic Orders and pediment. Plain wall surfaces almost disappear. Mouldings bolder and richer, but less refined. Flat pitched tiled roofs. Great shields at angles the chief ornament.	More varied and picturesque. Gothic influence greater. Pointed arches. Orders subordinated. Entablature broken round the columns, and Orders used in successive tiers. Windows large and grouped together in central portion. Little rusticated. Shell ornament typical. Built on canals, therefore entrance with steps, but without portico projections. Balconies much used. Roofs with balustrades. Much high relief figure-work in spandrels, &c.	Varied planning on grander scale. Constant applications of the Orders. St. Peter's exerted a great influence. Pilasters and cornices are of small projection. Large mass of wall to openings. One bold cornice, Pilasters instead of columns, generally two storeys united by one large Order. Openings square headed Quoins rusticated. Roofs not as a rule visible. Mouldings pure classic.

[Answers to questions set in Subjects I. and II. were published in our issue for July 11th.]

Enquiries Answered.

Brown Spots on Granite.

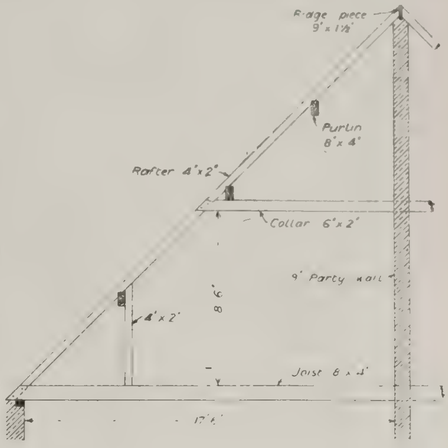
QUERIST writes: "On a building in course of erection a number of brown spots have appeared. The stone is a light grey granite (there are also traces of iron spots). Spirits of salts and sulphuric acid have been applied and the brown spots removed. Will this treatment permanently cure the spots or will they appear again? Are the brown spots due to quarry sap?"

One would require to inspect the stones in question before being able to express a definite opinion as to the cause of the brown spots referred to. Although sometimes caused by iron or quarry sap in the stone, they are more frequently the result of the application of such chemicals as you name. When the work is completed and cleaned down it is unfortunately a frequent practice to apply spirits of salts or other such acids to take out any dirty marks or stains (and often it is done during erection by workmen without one's knowledge). This it does temporarily, but the chemical eats into the stone and before long turns the stone browner than ever. We strongly condemn the use of any such chemicals being applied to any fine-axed grey granite.

Collar-Beam Truss.

LONDON.—AUTOLOCAS writes: "Please give me an idea of the necessary scantlings for a purlin roof as shown by sketch. I have called it a purlin roof, but doubt if a purlin is necessary if the wall above the collar is omitted and a ridge beam is substituted for the 7 × 1½ ridge. The gable walls are about 15ft. apart. The collar could be raised to make the room 9ft. 6ins. high, but I should wish to avoid this, if possible. Has any book on roofs been published—not merely king, queen and collar, but odds and ends of roofs such as above?"

The collar-beam truss submitted cannot be used as such on a span of 35ft. The simplest method of overcoming the difficulty will be to add purlins as shown in the sketch herewith. The gable walls being only 15ft. apart, 8in. by 4in. purlins may be fixed as shown, or they may be inclined if preferred. In either case it is desirable to notch the rafters slightly to prevent slipping. I know of no book giving information upon such roofs as this.



HENRY ADAMS.

Sundials.

HAMMERSMITH. — STUDENT writes: "Please give the setting-out for a sundial in a horizontal position."

Spackman's "History of the Sundial" (Batsford, 6s. 6d. nett), may be consulted; also Gatty's "Book of Sundials" (Batsford, £1 11s. 6d. nett).

HENRY ADAMS.

Journal for Brickmaking Industry.

EASTBOURNE.—O. writes: "Is there a special journal devoted to the brickmaking industry?"

Yes, the *British Clayworker*, Essex Street, Strand, W.C.

Obituary.

Mr. John Fyfe, the well-known Aberdeenshire granite merchant, died suddenly at his residence in Aberdeen on Wednesday last. Mr. Fyfe carried on one of the largest businesses in the granite industry in the kingdom, and his name was associated with some of the most important works that have been carried out in this country during the past quarter of a century. He supplied materials for Kew, Putney and the Tower Bridges, and many other large undertakings.

Our Plates

Two Newcastle Buildings.

We illustrate in this issue two buildings at Newcastle-on-Tyne opened by His Majesty the King recently—the Nurses' Home at the Royal Infirmary and the Armstrong College extension. A detailed description of each was given on page 6 of our issue for July 4th. The infirmary, we may say, has cost about £250,000, and provides accommodation for 420 in-patients, with a waiting hall in the out-patients' department for 400. The new wing to the Armstrong College completes this building. It has a front of about 100ft. to the Castle Leazes, with a central tower 120ft. high to the parapet. Behind is the examination hall.

Complete List of Contracts Open.

WITH a few exceptions, news of Contracts Open are not repeated after they have been published once in these columns, so that readers will find particulars in our previous issues of other contracts that still remain open.

Unless expressly stated to the contrary, all deposits required for bills of quantities, &c., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair-wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

July 26. London, N.E.—*Erection of a cen'ral library building* in Mare Street, Hackney. Plans and specifications may be seen and bills of quantities, with conditions, form of tender and form of contract may be obtained at the offices of the architect, H. A. Crouch, A.R.I.B.A., 12 Gray's Inn Square, W.C., on payment of £1 1s. Tenders, sealed and endorsed "Tenders for Central Library Buildings," to be deposited with W. A. Williams, town clerk, Town Hall, Hackney, not later than 5 p.m. on July 26.

July 26. Nantymoel.—*Erection of new stables, carthouse, yard, and boundary walls*, also new butcher's shop, and conversion of existing stables into shoemaker's shop at Nantymoel, near Bridgend, for the Co-operative Society. Plans and specifications may be seen at the Co-operative Stores, where forms of tender and bills of quantities can be obtained upon a deposit of £1 1s. Sealed and endorsed tenders to be sent to the secretary, Mr. John Morgan, Co-operative Society, Nantymoel, not later than July 26.

July 26. York.—*Extending the destructor buildings*, Foss Islands Depôt. Specification and bill of quantities may be obtained of A. Creer, architect, Guildhall, York, on deposit of £1 1s. Tenders, endorsed "Destructor Buildings," to be delivered not later than noon on July 26.

July 26. Minehead.—*Erection of three houses aud Garage*, in the Parks, Minehead, for J. K. Heard, Taunton. Sealed tenders to be left with W. J. Tamlyn, architect, Minehead, not later than July 26. For plans and further particulars apply to W. J. Tamlyn.

July 27. Orton.—*Erection of ante-room* to Inchberry Public Hall, Orton. Plans and specifications may be seen with A. B. Hunter, chairman of Inchberry Hall Committee, Orton Station, with whom offers, endorsed "Ante-Room," may be lodged on or before July 27.

July 27. New Byth.—*Mason, Carpenter and Slater Works of erecting a new barn and stable* at Backhill of Auchnagorth (Cassie), New Byth. Plans, specifications and general conditions can be seen at the farm; or with Davidson & Garden, 12 Dee Street, Aberdeen, with whom offers are to be lodged not later than July 27.

July 27. London, S.E.—*Erection of a branch library* in London Street, West Greenwich, according to the drawings, specification, and conditions of contract and bond, which may be seen at the office of Wills & Anderson, architects, 24, Bloomsbury Square, London, W.C., between the hours of 10 and 12 on July 18, 19, and 20, 1906. Bill of quantities, prepared by Fowler & Hugman, F.R.S.I., may be obtained of the town clerk, Town Hall, Greenwich, upon payment of a deposit of £2 2s. The tenders, on the form supplied, sealed and endorsed "Tender for Branch Library," must be delivered to the Town Clerk, not later than 12 o'clock noon on July 27, 1906. Fair wages clause.

July 28. St. Annes-on-the-Sea.—*Technical School* at St. Annes-on-the-Sea, for the Urban District Council. Plans may be seen and bills of quantities obtained from the office of the county architect, Henry Littler, 16, Ribblesdale-place, Preston, by payment of a deposit of £2. Sealed tenders, endorsed "Technical School," must be sent so as to reach T. Bradley, Public Offices, St. Annes-on-the-Sea, not later than 12 o'clock noon on July 28.

July 28. Pontycymmer.—*Erection of a school hall* at Pontycymmer, for the English Calvinistic Methodist Church. Plans and specifications may be seen with Owen Jones, Saddler, Pontycymmer, or A. L. Thomas, architect and engineer, Church Street Chambers, Pontypridd. Sealed and endorsed tenders to be sent to Owen Jones on or before July 28.

July 28. Exeter.—*Erection of an elementary school for girls and infants* in St. James's Road, Exeter, in accordance with drawings and specifications which may be seen at the offices of James Jerman, F.R.I.B.A., architect and surveyor, Bedford Circus, Exeter, for the City Council. Bills of quantities may be obtained on payment of the sum of £1 1s. Tenders endorsed "Tender for St. James's School," to be sent to H. L. Parry, town clerk, Exeter, on or before July 28.

July 28. Penygraig.—*Building a vicarage* at Penygraig for the Rev. T. E. Griffiths. The plans and specification can be seen and quantities obtained of E. M. B. Vaughan, architect, Cardiff, on receipt of £2 2s. The tenders are to be delivered at the architect's office on or before noon on July 28.

July 28. Mynyddislwyn.—*Restoring and repairing the parish church* of Mynyddislwyn, near Abercarn, for the Rev. J. Jones Lewis. The plans and specification can be seen and quantities obtained of E. M. B. Vaughan, architect, 21, Dumfries Place, Cardiff, on receipt of £2 2s. The tenders are to be delivered at the architect's office on or before noon on July 28.

July 28. Irvine.—*Timber Beacon at the entrance to Irvine Harbour*, for the harbour trustees. Drawings and specification can be seen at the Harbour Office, Irvine; sealed offers, marked "Offer for Beacon," to be lodged with J. Norval Murray, Council Chambers, Irvine, not later than Saturday, July 28. The contractor can have the use of a barge and steam piling ram at a rate to be arranged.

July 28. Penzance.—*Villa residence*, at Lescudjack, Penzance. The plans and specifications may be seen of O. Caldwell, F.R.I.B.A., Victoria Square, Penzance; sealed tenders, endorsed "Tenders for Villa," to be sent to O. Caldwell on or before July 28.

July 29. Youghall—*Erection of nine houses* for the accommodation of the working classes, on Cork Hill, including the drainage, water supply, fencing and roadway, according to plan and specification (amended in red ink by the town surveyor), which can be seen at the town hall between the hours of 11 a.m. and 4 p.m., for the Urban District Council. Each tender must be accompanied by a schedule giving the quantities and prices upon which said tender in founded. Contractors must examine the site before tendering, as no extras will be allowed under any circumstance. Each tender is to be on the prescribed form (to be obtained from J. J. O'Shea, clerk, Urban District Council, Town Hall, Youghal), and is to contain the genuine signatures of two solvent persons willing to enter into a joint and several bond for the due execution of said works within the time specified. This bond and contract is to be prepared by the Council's Law Adviser and paid for by the contractor. Tenders, endorsed "Tender for the Housing of the Working Classes," addressed to the Chairman, Town Hall, to be sent through the Post Office not later than July 29.

July 30. Pontardulais.—*Three new shops, altering present shop, and erecting new offices* at Pontardulais. Plans and specifications may be seen at the offices of Williams & Henton, Bank Chambers, Heathfield Street, Swansea. Endorsed tenders to be sent to W. McWilliams, Bank House, Pontardulais, not later than July 30.

July 30. Sunderland.—*Additions, comprising Class Rooms, &c.*, to the West Boldon Wesleyan Chapel. Plans may be seen and quantities obtained on application to the Architects, 20, Fawcett Street, Sunderland. Tenders will be received up to 12 o'clock noon on July 30.

July 30. Fetteresso.—*Restoration of the farm steading destroyed by fire, and of a proposed new bothy at the farm of Blairs, Fetteresso.* The plans may be seen with G. Gregory, architect, David Street, Stonehaven, from whom schedules ofquantities may be obtained, and who will meet intending contractors at the farm; offers to be lodged with A. W. Kinner, solicitor, Stonehaven, on or before July 30.

July 30. Leeds.—*Building of additional Storeys to Warehouse Premises* in Skinner Lane, Leeds, also for brick-setting No. 1 Lancashire boiler. Intending contractors must forward their names to T. Winn & Sons, Architects, 84, Albion Street, Leeds, on or before July 30, when bills of quantities will be duly forwarded.

July 30. Warrington.—*A light telescopic ladder tower* for emergency work for the Electricity and Tramways Committee. Particulars and specification can be obtained on application to F. V. L. Mathias, A.M.I.E.E., Borough Electrical and Tramways Engineer, Howley, Warrington. Tenders must be sealed with wax, endorsed "Tender for Telescopic Ladder," and delivered not later than 12 o'clock noon on July 30, 1906, addressed to the Chairman of the Electricity and Tramways Committee, Town Hall, Warrington.

July 30. Glasgow.—*Sponge cloth laundry* at St. Rollox Stores. The drawings may be seen at the office of the company's engineer, Buchanan Street Station, Glasgow, where copies of the specification and schedule may be obtained on payment of £2 2s. Sealed tenders, endorsed "Tender for Construction of Sponge Cloth Laundry at St. Rollox," to be lodged with J. Blackburn, secretary, Caledonian Railway Company's Offices, 302, Buchanan Street, Glasgow, on or before July 30.

July 31. Whitehaven.—*Alterations and additions to the Old Infirmary* at the Workhouse, Whitehaven, for the Guardians. Drawings, specifications and conditions of contract may be inspected at the office of George Boyd, C.E., 33, Queen Street, Whitehaven, from whom form of tender and schedule of quantities may be obtained on payment of 5s. Sealed tenders, endorsed for "Tender for Workhouse Alterations," will be received by W. H. Atkinson, clerk, Union Hall, Whitehaven, up to noon on July 31.

July 31. Gosforth.—*Taking down and setting back the boundary wall of the South Gosforth Council School, Station Road: undersetting the north wall of the school building, and forming the added width of roadway.* All particulars may be obtained from G. Nelson, engineer and surveyor to the Council, Council Chambers, High Street, to whom application should be made for quantities. Tenders, endorsed "Road Widening, &c., South Gosforth Council School," to be sent to R. S. Holmes, Council Chambers, Gosforth, not later than July 31.

July 31. Derby.—*Enlargement of the branch post office* at Midland Road, Derby. Drawings, specification, and a copy of the conditions and form of contract may be seen on application at the Midland Road Branch Post Office, Derby, between the hours of 10 a.m. and 4 p.m. Bills of quantities and forms of tender may be obtained of the Secretary, H.M. Office of Works, Storey's Gate, London, S.W., on payment of £1 1s. Tenders must be delivered before 12 o'clock noon on July 31, addressed to the Secretary, H.M. Office of Works, &c., Storey's Gate, London, S.W., and endorsed "Tender for Derby Branch Post Office Enlargement."

July 31. West Hartlepool.—*Construction of steps* leading from the Longhill subway to the proposed road, in accordance with plans, sections, and specification to be seen, and approximate quantities obtained of N. F. Dennis, Borough engineer and surveyor, Municipal Buildings. Tenders, endorsed "Construction of Steps, Longhill Subway," and addressed to the Chairman of the Works Committee, are to be delivered at the office of the Town Clerk, 78, Church Street, not later than 4 p.m., on July 31.

July 31. Wolverhampton.—*Erection of additions to the administrative block* at the fever hospital in Green Lane. Plans may be seen, and specifications, bill of quantities, and form of tender obtained on application to G. Green, Borough engineer, Town Hall, Wolverhampton, upon payment of a deposit of £1 1s. Tenders, addressed to the chairman of the Health Committee, to be delivered at the Town Clerk's Office by 10 a.m. on Tuesday, July 31. (Fair wages clause.)

July 31. Rothwell Haigh.—*Erection of an engine-house and pump-room* at their new workhouse, Rothwell, Haigh, in accordance with the drawings and specifications prepared by W. E. Richardson, architect, Rothwell, near Leeds. Applications for bills of quantities and forms of tender must be made to the architect on or before July 21, and bills of quantities will be supplied to such applicants only. Drawings may be inspected at the offices of the architect, and tenders, on forms provided, must be delivered to F. W. Mee, Union Offices, Hunslet, Leeds, by 10 o'clock on Tuesday, July 31.

August 1. Slapton.—*Erection of a Vicarage House* at Slapton. Plans and specifications can be seen on application to Mrs. Bowles, Carr Lane, Slapton, between the hours of 10 and 4 o'clock, or at the office of W. F. Tollit, architect, 10, High Street, Totnes, from whom any further particulars can be obtained. Tenders are to be sent to Oldrieve and Hingston, Bridgetown, Totnes, on or before August 1.

August 1. London, W.—*Erection of Workshops* at the Workhouse in the Harrow Road, W., pursuant to plans and specification to be seen at Messrs, Giles, Gough & Trollope, architects, 27 Craven St,. Strand W.C., between the hours of 10 and 5, where all necessary information can be obtained and also form of tender. Bills of quantities may also be obtained at the Offices of the said architects, on payment of a deposit of £5 5s. Fair wages clause. Sealed tenders must be delivered to H. F. Aveling, 313-319, Harrow Road, W., before 10 o'clock a.m. on August 1.

August 1. Nottingham.—*New Baptist Mission Hall*, Robin Hood's Chase, Nottingham. Plans and specification may be seen with Mr. Phillimore, 114, Alfreton Street, Nottingham, and at the offices of W. Burns Rees, architect, 3, Dumfries Place, Cardiff, from whom bills of quantities may be obtained. Tenders are to be sent to the Hon. Pastor, W. A. Coombs, Roseholme, Clumber Avenue, Mapperley Plains, Nottingham, on or before August 1.

Aug. 1. Pontypridd.—*Erection of a large chapel and schoolroom* for the English Baptist Church at Hopkinstown, Pontypridd. Plans and specifications may be seen of A. L. Thomas, A.M.I.C.E., architect and engineer, Church Street Chambers, Pontypridd. Sealed and endorsed tenders to be sent to the Rev. Samuel Davies, Oakfield, Pwllgwaun, Pontypridd, on or before Aug. 1.

Aug. 2. Alnwick.—*Erection of new residence* at Alnwick for Wm. Percy, Esq. The plans and specifications may be seen of G. Reavell, Junr., Alnwick, and the tenders, duly endorsed, must reach him not later than noon, August 2.

August 3. Ton Mawr.—*Erection of stables at the railway inn*, Ton Mawr, near Pontrhydyfen. Plans and specifications can be seen at the railway inn or of T. Roderick, architect, Ashbrooke House, Aberdare, where bills of quantities can be obtained. Endorsed tenders to be sent in to the architect not later than August 3.

August 4. Roseudian.—*Cattle house at Roseudian*, in the parish of St. Hilary, in the occupation of Mr. Benjamin Hocking and the executors of Mr. William Hocking. Plans, conditions and specifications, which are now at the farmhouse at Roseudian, can be inspected; tenders should be sent, on or before August 4, to G. Gow, Tregothnan Office, Truro.

August 4. Hayle.—*Stable buildings, &c.*, at Hallankean, Hale, in the occupation of J. H. Richards, where the plans and specifications may be seen. Tenders to be sent to S. Lawrey, Helnoweth Gulval, August 4.

August 4. Wakefield.—*Works in connection with alterations to Wales Kiveton Park Provided School.* Plans may be seen and quantities obtained on application to J. Vickers-Edwards, county architect. A deposit of £1 is required. Cheques to be sent to the West Riding Treasurer, County Hall, Wakefield. Sealed tenders, properly endorsed, to be sent to J. Vickers-Edwards, county architect, County Hall, Wakefield, not later than 10.30 on the morning of August 4.

August 6. Dumfries.—*Pavilions at the Crichton Royal Institution, Dumfries.* Plans and specifications, &c., can be seen at the Crichton Royal Institution, Dumfries. The Clerk of Works will be in attendance at the institution on July 25, 26, and 27, to give explanations or information necessary. Tenders must be lodged with S. Mitchell & Wilson, 13, Young Street, Edinburgh, on or before August 6.

August 6. Riverside, Radstock.—*Re-construction of existing buildings as business premises*, comprising a draper's shop, furniture store, &c., at Riverside, Radstock, for the Radstock Co-operative Society, Ltd. Plans and specification may be seen by appointment with W. F. Bird, architect, Midsomer Norton, and bills of quantities and form of tender will be forwarded in order of application. Persons desirous of tendering must send their names to the architect not later than July 25, and sealed tenders, endorsed "Proposed Premises, Riverside," are to be delivered to the secretary of the society on or before August 6.

August 7. Cradley—*Erection of a corrugated iron goods shed, offices, &c.*, on the Spinners End Goods Branch, Cradley, for the Directors of the Great Western Railway Company. Plans and specification may be seen and forms of tender and bills of quantities obtained at the office of the Engineer at Wolverhampton Station, between the hours of 10 a.m. and 4 p.m. Tenders addressed to G. K. Mills, Secretary, Paddington Station, London, W., and marked outside "Tender for Goods Shed, etc., Cradley," will be received on or before August 7.

August 15. Lostock Hall, near Preston.—*Erection of a new Public Elementary School* at Lostock Hall, near Preston. The plans may be seen and bills of quantities obtained at the office of Henry Littler, county architect, 16, Ribblesdale Place, Preston, by payment of a deposit of £2. Tenders must be delivered before 12 o'clock noon on August 15, 1906, sealed and endorsed, to W. S. Woodcock, Council Offices, Bamber Bridge, near Preston.

August 16. Antwerp.—*Reconstruction of the Government Bonded Warehouses*, known as the "Nord-Ancien and Nord-Nouveau." The specification ("*Cahier des charges*," No 1,144), relating to the contract may be obtained from the Hôtel de Ville, Antwerp, at a cost of 2 francs. All tenders should be sent in sealed registered envelopes, addressed "A Monsieur le Bourgmestre en l'Hôtel de Ville d'Anvers," and should reach the Hôtel de Ville not later than August 16. A deposit of £1,000 is required to qualify any tender. A copy of the specification may be seen at the offices of the Commercial Intelligence Branch of the Board of Trade, 73 Basinghall Street, London, E.C.

August 21. Sheffield.—*Underground conveniences adjoining the town hall in Surrey Street* for the Health Committee. Specification and plans may be seen and quantities obtained at the office of C. F. Wike, C.E., city surveyor, Town Hall, Sheffield, on payment of £1 1s. Tenders, endorsed "Town Hall Conveniences," are to be sent in not later than 6 p.m. on August 21, addressed to "The Chairman and Members of the Health Committee, City Surveyor's office, Town Hall, Sheffield." A fair wages clause.

No Date. Ballymena.—*A 60-feet brick chimney* at Ahoghill Creamery, Ballymena. Plans and specifications can be seen at Creamery.

No Date. London, E.—*Erection of a boundary wall* on the Workhouse premises in Bancroft Road, E., for the Mile End Old Town Board of Guardians. Forms of tender and full particulars relating to the work can be had upon application at the offices of J. M. Knight, architect, 35, Bancroft Road, Mile End, E. Fair wages clause.

No date. Coleford, Gloucester.—*Erection of a Doctor's Residence* at Coleford, in the County of Gloucester, for Dr. J. Rowland Payne. Intending contractors are requested to forthwith send in their names to E. G. Davies, M.S.A., architect, 7, Bridge Street, Hereford, and at Monmouth, when plans, specification, and form of tender will be supplied.

ENGINEERING.

July 27. Sunderland.—(*a*) *Two 250-kw. synchronous motor generators, 5000—240 volts.* (*b*) *High tension and low tension switchgear for the electricity department.* The specifications and forms of tender can be obtained on application to the Borough Electrical Engineer, J. F. C. Snell, M.Inst.C.E., Town Hall, Sunderland, and on payment of a deposit of £1 1s. for each specification. Sealed tenders addressed to the "Chairman of the Electricity and Lighting Committee," Town Hall, Sunderland, must be delivered to F. M. Bowey, Town Hall, Sunderland, not later than 12 o'clock noon on July 27. Tenders to be endorsed "A" or "B" according to the item tendered for.

July 30. Stanley and West Hallam.—*Waterworks at Stanley and West Hallam*, Derbyshire, including laying 4,466 yards of 6in., 3,050 yards of 4in., and 1,910 yards of 3in. cast iron pipes, with all appurtenances, and the construction of a brick service reservoir (capacity 90,000 gallons). Plans may be seen and specification and bills of quantities obtained, at the offices of Elliott and Brown, engineers, Burton Buildings, Parliament Street, Nottingham, after July 16, 1906, on deposit of £2 2s. Sealed tenders, addressed to J. W. Newbold, Council Offices, Derby, and endorsed "Tender for Waterworks," to be delivered on or before the first post on July 30, 1906.

July 31. Shanghai.—*For the supply and delivery c i.f. Shanghai of the following plant:*—for the Municipal Council. *a.*—Two 600 kilowatt Steam-Turbo Dynamos, or, as an alternative, Two 600 kilowatt Steam Dynamos, together with Condensing Plant, certain Pipes and Valves, Motor-Generator, Switchboards, &c. *b.*—Two Water-tube Boilers, with Feed-water Heaters, Superheater and Chain-grate Stokers, Feed Pump, Pipes, Valves, &c. Specifications, general conditions, and forms of tender can be obtained from Preece & Cardew, 8, Queen Anne's Gate, Westminster, S.W., on payment of a deposit of £2 for each section. Extra copies of the specification and general conditions for each section can be obtained on payment of 5s. each (non-returnable). Sealed tenders, endorsed "Shanghai Electricity Supply," are to be addressed to Preece & Cardew, 8, Queen Anne's Gate, Westminster, S.W.. and delivered before 12 o'clock noon on July 31.

August 1. Sutton, Surrey.—*Installation of electric lighting at the Downs School*, Banstead Road, Sutton, Surrey, for the Metropolitan Asylums Board, in accordance with drawings and specification prepared by W. T. Hatch, M.I.C.E., M.I.M.E., Engineer-in-chief. Drawings, specification, conditions of contract, and form of tender may be inspected at the office of the Board, Embankment, E.C., and can then be obtained upon payment of a deposit of £2. Tenders, addressed as noted on the form, must be delivered at the office of the Board not later than 10 a.m. on August 1.

August 2. Aberdeen.—*Widening of Union Bridge* by the addition on each side of a steel arch rib and by extending the existing masonry abutments and all other work in connection therewith. Drawings may be seen and specifications, schedules of quantities and form of tender obtained from W. Dyack, borough surveyor, Aberdeen, on deposit of the sum of £5. Sealed tenders addressed to the Town Council of Aberdeen and endorsed "Tender for Aberdeen City Improvements, Union Bridge Widening," to be lodged with the Borough Surveyor not later than 11 a.m. on August 2.

August 2. Aylesbury.—*Repairs to Holman's Bridge*, Buckingham Road, Aylesbury; also for taking down and rebuilding the stone wing walls to the N. arch of Ickford Bridge, near Thame. Plans and specifications may be seen and further information obtained at the office of R. J. Thomas, county surveyor, County Hall, Aylesbury, where tenders must be delivered before 11 a.m. on August 2.

August 4. Stoke-upon-Trent.—*Supply, delivery and erection of a water tube boiler.* Specification and form of tender may be obtained from P. J. S. Tiddeman, borough electrical engineer, on payment of a deposit cheque of £2 2s. Tenders to be sent in addressed to "The Chairman of Electricity Committee, Electricity Works, Stoke-upon-Trent," endorsed "Tender for Boiler," not later than August 4.

August 7. Dudley.—*Construction of a branch line* to Raggeridge Colliery, near Dudley, about $1\frac{3}{4}$ miles in length. Plans and specification may be seen and forms of tender and bills of quantities obtained at the office of the New Works Engineer at Paddington Station, between the hours of 10 a.m. and 4 p.m. Tenders, addressed to G. K. Mills, secretary, Paddington Station, London, W., and marked outside "Tender for Raggeridge Branch," will be received on or before August 7.

August 7. Weymouth.—*Reconstruction of the viaduct* carrying the Weymouth and Portland Line over the backwater at Weymouth, and the *erection of a new station* adjacent thereto for the Great Western Railway Co. Plans and specification may be obtained, and forms of tender and bills of quantities obtained at the office of the Engineer at Paddington Station, London, W., between the hours of 10 a.m. and 4 p.m. Tenders, addressed to G. K. Mills, secretary, Paddington Station, London. W., and marked outside "Tender for Works at Weymouth," will be received on or before August 7.

August 9. Painswick.—*Supplying materials and constructing a reservoir* at Painswick. Also for the providing and laying of about 9,163 yards of 6in., 4in., C.I. Mains, and $1\frac{1}{2}$in., 1in., and $\frac{3}{4}$in. galvanised piping, together with the necessary bends, t's, valves, &c., from Cashes Green to Painswick, Gloucestershire, for the Stroud Water Co., in accordance with plans and specifications, which may be inspected at the Company's office, 13, Kendrick Street, Stroud, on Mondays and Fridays. Tenders, to be endorsed "Extension to Painswick," are to be sent to the Secretary of the Company, 181, Queen Victoria Street, London, on or before August 9.

August 9. Bolton.—*Two Lancashire boilers* for the Electricity Committee of the Bolton Corporation. Specification and form of tender may be had on application to A. A. Day, A.M.I.C.E., M.I.E.E., borough electrical engineer, Spa Road, Bolton. Tenders, endorsed "Tender for Boilers," to be delivered not later than 12 o'clock noon, August 9, addressed to the Chairman of the Electricity Committee, Town Clerk's Office, Town Hall, Bolton.

Sept. 4. Lancaster.—*Proposed reconstruction of steam heating arrangements and hot-water service.* The last date for receiving tenders for the above work has been extended to Sept. 4. Contractors please note. J. T. Cheetham, clerk and steward.

September 4. Lancaster.—Proposed re-construction of steam heating arrangements and hot water service at County Lunatic Asylum, Lancaster. Tenders to be sent by September 4th (extended date) to J. T. Cheetham, clerk and steward.

No date. Workington.—*Heating of Victoria Infant School* by hot water (radiators and piping) are requested to send in their names to E. J. Hepworth, secretary, Education Offices, Workington, as early as possible.

No date. Longton.—*Painting, colouring, &c., at the undermentioned schools*, within the Borough. Woodhouse, Florence, High-street, Edensor, St. James's, Normacot Specifications and other particulars may be obtained on application to J. W. Wardle, Assoc.M.Inst. C.E., borough surveyor, Court House, Longton.

IRON AND STEEL.

July 26. Rotterdam.—*Contract lit. Q 12—8,200 iron telegraph poles (light). Contract lit. R 12—700 iron telegraph poles (heavy)* for Netherlands Colonial Office at the Hague, up to July 26. Particulars can be obtained from Mr. M. Nijhoff, the Hague, at a cost of 1 florin (1s. 8d.) in respect of each contract.

July 26. London, S.W.—*Cast-Iron Fire-Alarm Indicators*, to be fixed on certain Street Gas Lamps and Electric Light Columns. Persons desiring to submit tenders may obtain form of tender, drawings and other particulars at the department of the Clerk of the Council, County Hall, Spring Gardens, S.W., upon payment to the Cashier of the Council the sum of 5/–. Tenders must be upon the official forms, and the printed instructions contained therein must be strictly complied with. Fair wages clause. Each tender is to be delivered at the County Hall, in a sealed cover, addressed to "The Clerk of the London County Council, Spring Gardens, S.W.," and marked "Tender for Fire-Alarm Indicators." No tender will be received after 10 a.m. on July 26.

July 26. Dublin.—*Supply of* 5500 *tons steel rails*, 400 *tons steel soleplates*, 150 *tons steel fishplates*, invited by the Directors of the Great Southern and Western Railway, in accordance with the specifications, which can be obtained on application to the Company's Engineer, Inchicore, Dublin. The specifications for the rails (2), fishplates (2) and soleplates are upon separate forms, and a charge of 5s. will be made for each specification. Tenders, which must be made on the form attached to the specification, must be delivered to F. B. Ormsby, Kingsbridge Terminus, Dublin, endorsed "Tender for Rails, &c.," before 10 a.m. on Thursday, July 26

July 30. Ballinasloe.—*Supplying and erecting five iron and steel roof frames* for a span of 30 feet in the clear, for the District Asylums, according to plans and specifications prepared by W. H. Kempster, C.E., which plans may be seen at the Asylum Office between the hours of 10 a.m. and 4 p.m. Tenders, marked "Tender for Roof Frames," to be sent to the Resident Medical Superintendent on or before 12 o'clock noon on July 30.

July 30. Reading.—*Ironwork and fittings* in connection with a cattle auction with sale ring. Two ranges of sheep pens and two ranges of pig pens at the Corporation Cattle Market, Great Knollys Street, Reading. Drawings and specification may be inspected, and form of tender, &c., obtained at the Offices of the Borough Engineer and Surveyor, Town Hall, Reading. Fair wages clause. Sealed tenders, in the printed addressed envelopes provided for the purpose, must be delivered to J. Bowen, borough engineer and surveyor, Town Hall, Reading. not later than 12 o'clock noon on July 30.

July 30. Durban, Natal.—*Supply and delivery, "free on board," of 166 welded steel tube tramway poles*, 38ft. long, in one length, with cast-iron finials, all of British manufacture, for the Corporation. Particulars may be obtained on application to Webster, Steel & Co., 5, East India Avenue, Leadenhall Street, E.C., to whom tenders (sealed and endorsed) must be delivered on or before July 30.

July 30. West Hallam.—*Supply and free delivery at West Hallam, Derbyshire, of cast-iron pipes, special castings, &c.*, in connection with the water supply of Stanley and West Hallam, near Ilkeston, for the Shardlow Rural District Council. The contract will comprise about 186 tons of 6in. pipes, 76 tons of 4in. pipes, and 35 tons of 3in. pipes. Full particulars, with specification, bills of quantities, and form of tender, may be obtained from Elliott & Brown, engineers, Burton Buildings, Parliament Street, Nottingham, on deposit of £2 2s. Sealed tenders, addressed to J. W. Newbold, Council Offices, Becket Street. Derby, and endorsed "Tenders Iron Pipes," to be delivered on or before July 30, 1906.

Aug. 2. Ashford, Middlesex.—*Supply Delivery, and erection on their premises at Ashford, Middlesex, of the following plant and materials* for the Managers of West London District Schools. Contract No. 1.—Pipework and sundry apparatus for Exhaust Steam Heating System. Contract No. 2.—Pipe Trenches and sundry Builder's Work. Contract No. 3.—Chimney Shaft, Economiser Chamber, and Flues. Contract No. 4.—Two 50 kw. Steam Dynamos (high-speed D.A. vertical compound engines), and Boosters, an Electric Motor, Additions and Alterations to Switchboard, some 200 yds. of Cable, and sundry other work. Contract No. 5.—Alterations and extensions to Steam, Exhaust, Feed and Drain Pipes, a Green's Economiser, &c. Copies of the general conditions applicable to all the contracts, the specifications, drawings, and forms of tender may be obtained by application to F. G. Beeching, clerk to the managers, Ashford, Middlesex, at the schools, on payment of a deposit of £3 3s. for each section. Copies of the above-mentioned documents may be seen (but not obtained) at the offices of F. H. Medhurst & Lloyd, consulting engineers, 13, Victoria Street, Westminster, from whom all particulars of the work may be obtained. Persons tendering may inspect the schools on week-days, between the hours of 10 a.m. and 4 p.m. The tenders must be delivered to F. G. Beeching (as per instructions with the forms) not later than 6 p.m. on Thursday, Aug. 2.

August 7. Hemsworth.—*Supply of 1,982 lineal yards of cast-iron socketed water main pipes*, 3in. diameter, for the Rural District Council, also for the cutting and filling of trenches and the laying and jointing of about 1,982 lineal yards of 3in. cast-iron water mains at Thorpe Audlin, near Pontefract. Plan, etc., may be seen at the office of T. H. Richardson, surveyor, Hemsworth, from whom further particulars may be obtained. Tenders are to be sent to J. Scholefield, clerk to the Council, Hemsworth, near Wakefield, not later than August 7.

August 15. Leeds.—*Steam, feed-water, exhaust, overflow, blow-off, and other pipes, valves, &c.*, in connection with a Steam Turbo-Generator of 3,000 kilowatts, for the Electricity Committee of the Leeds City Council. Copies of the general conditions, specification, and form of tender, may be obtained from H. Dickinson, Manager of the Department, 1, Whitehall Road, Leeds, on payment of a deposit of £2 2s. Tenders must be in the form attached to the specification and must be delivered to R. E. Fox, town clerk, Town Hall, Leeds, not later than 10 o'clock on August 15, in sealed envelopes endorsed, "Electric Lighting—Tender for Pipes, &c."

No Date. Swansea.—*Three pairs of steel lock gates, together with three pairs of direct-acting hydraulic presses for opening and closing the same, with all necessary valves, pipes and connections.* On and after July 30, drawings may be inspected between eleven a.m. and 4 p.m. at the office of A. O. Schenk, M.Inst.C.E., Trustee's Engineer, Harbour Offices, Swansea, and copies of the Drawings, Specification, Conditions and Forms of and Instructions for Tender may be obtained of T. Strick, clerk, Harbour offices, Swansea on payment of £5 5s.

PAINTING AND PLUMBING.

July 27. Salford.—*Whitewashing, painting, and decorating* required at the following:—Union Workhouse, Eccles New Road, Salford; and Union Infirmary, Hope, near Eccles, for the Guardians of the Salford Union. Specifications can be obtained at the Union offices. Tenders must be delivered to F. Townson, clerk to the Guardians, Union Offices, Eccles New Road, Salford, in sealed envelopes, endorsed "Tender for Painting, &c.," not later than 10 a.m. on July 27. Persons may tender for the whole or any portion of the work.

July 27. Cardiff.—*Painting, colouring, &c.*, the inside of the Lansdowne Road Council School for the Cardiff Education Committee. Specifications of the work may be obtained at the Education Offices, Howard Gardens, Cardiff. Tenders sealed and endorsed "Tender for Painting Lansdowne Road Council School," must reach J. J. Jackson, Director of Education, Education Offices, Howard Gardens, Cardiff, by noon on July 27.

July 28. Rochford.—*Painting and decorating the interior of Rochford Congregational Church.* Persons desiring particulars of the above work can obtain same at "Glenmore." Tenders to be in not later than July 28.

July 28. Castleknock.—*Plumbing works* required to be done at the new residence for the medical officer at Castleknock, in accordance with the specification and plans, which can be seen and copied at Boardroom, North Brunswick Street, Dublin. Any further information can be had from Mr. Morris, clerk of works. Fair wages clause. Sealed tenders (with wax) will be received in the tender box at the Boardroom up to noon on July 18.

July 30. Drumlithie. — *Carpenter, painter, and slater work on the public schools and schoolhouses at Drumlithie and Brae of Glenbervie.* Specifications can be seen in the hands of S. A. Smith, Pitdrichie, clerk to the board, and offers to be lodged with him not later than July 30.

July 30. Caerau, near Cardiff.—*Painting and glazing* required at their infectious diseases hospital now in course of erection at Caerau, near Cardiff, for the Llandaff and Dinas Powis Rural District Council, in accordance with specification and bill of quantities, which may be obtained on application to J. H. James, M.S.A., 18, Quay Street, Cardiff. Tenders, sealed and endorsed, to be sent to M. Warren, clerk, Park House, Cardiff, not later than twelve noon on July 30.

July 30. Croydon.—*Internal painting and decorating work at the Union offices* for the Guardians; the specification, conditions of contract, and form of tender may be obtained at the office of H. Berney, architect, 104, George Street, Croydon, surveyor to the Guardians, upon depositing the sum of £2 2s.; the contractor will be required to enter into a contract and bond with two sureties approved by the Guardians for the due performance thereof. Sealed tenders, marked "Tender for Painting, &c.," addressed to H List, Union Offices, Mayday Road, Thornton Heath, Surrey, must be delivered not later than four o'clock p.m. on July 30.

July 31. London, S.E.—*Internal painting at the Norwood Schools* for the Board of Guardians. Tenders, which will be received only on the printed form, must be sent by post on or before July 31, addressed to W. Thurnall, clerk, Guardians' Board Room and Offices, Brook Street, Kennington Road, S.E., and sealed and endorsed "Tender for Painting Norwood Schools," and will be opened at the Board Room at noon on the following day, when all persons tendering, or their authorized agents, must be in attendance. Draft of contract may be inspected at these offices on any day between the hours of 10 and 5. Specification and forms of Tender will be supplied on personal application and on payment of £2.

August 1. Huddersfield.—*Painting the exterior and interior of the Wholesale Market.* The successful tenderer will be required to execute a contract, the draft of which may be inspected at the Town Clerk's Office, Town Hall, between 10 and 4 o'clock. Specifications and general conditions may be seen, and bills of quantities and forms of tender obtained on application at the offices of K. F. Campbell, M.Inst.C.E., borough engineer. Sealed tenders, endorsed "Tender for Painting Wholesale Market," signed in the handwriting of the tenderer or his agent, and addressed "Town Clerk, Town Hall, Huddersfield," must reach him not later than 10 a.m. on August 1.

August 3. Nottingham.—*Taking out the old fittings and supplying and fixing new urinal fittings* and making other alterations to the existing urinals at Derby Road and Commercial Square, St. Ann's Well Road; plans may be seen and specifications and forms of tender obtained from F. B. Lewis, city architect, Guildhall, on payment of a deposit of £1 1s.; fair wages clause; sealed tenders to be delivered to S. G. Johnson, town clerk, Guildhall, Nottingham, at or before 10 a.m. on August 3, 1906.

ROADS AND CARTAGE.

July 26. Wallsend.—*Macadamising, kerbing, cementing, &c.*, certain roads. Plans and specifications may be seen and forms of tender obtained on application to G. Hollings, borough surveyor, corporation offices, Wallsend. Tenders, sealed, and endorsed "Tender for new streets, &c.," to be received by W. V. Mulcaster, 28, Sandhill, Newcastle-on-Tyne, on or before noon of July 26.

July 26. London, N.E.—*Kerbing, channelling, paving, making-up*, &c., at Mount Pleasant Lane, Upper Clapton, between Upper Clapton Road and Mount Pleasant Hill. The general conditions of contract and the specification and plan and sections may be inspected, and copies of the bill of quantities and form of tender obtained on application to Norman Scorgie, M.Inst.C.E., borough engineer and surveyor, and on payment of the sum of £1 1s. Fair wages clause. Tenders, sealed and endorsed "Mount Pleasant Lane." must be delivered at the Town Hall, Hackney, N.E., not later than 5 p.m. on July 26.

July 26. Cowpen.—*Paving their store yard in Seaforth Street, and flagging a portion of footpath in Turner Street, Waterloo*, for the Waterloo District Council. Plans and specifications may be seen and forms of tender obtained at the offices of R. Grieves, Seaforth Street, Blyth. Sealed tenders, endorsed "Tender for Paving," must be delivered not later than 4 p.m. on July 26.

July 28. Chard.—*Rolling the stones* to be laid on main and district roads during the ensuing season. The contractor to provide two 15-ton steam rollers fitted with Henderson's patent detachable scarifiers, and two 10-ton steam rollers, to commence work early in September. Additional rollers to be provided if required. Inclusive charges at per day and at per cubic yard rolled to be named, for the selection of the Council. Further information and forms of tender may be obtained from R. Stephens, district surveyor, Ilminster, or F. G. Ross, Rural District Council Office, Chard. Tenders, endorsed "Steam Rolling Tender," to be sent before July 28.

July 28. Lye and Wollescote.—*About 3,000 lin. yds. of Rowley granite kerbing, and 10,300 sup. yds. of granite sett paving*, to be laid on the Stourbridge and Halesowen main road, situate in the Urban District of Lye and Wollescote, for the Worcestershire County Council Highways and Bridges Committee. Drawings may be inspected, and specification, bill of quantities, and form of tender obtained, on application, and payment of a fee of £2 2s., to J. H. Garrett, Shire Hall, Worcester. Sealed tenders, marked "Tender for Granite Sett Paving," must be delivered to J. H. Garrett not later than 10 o'clock on July 28.

July 28. London, W.—*Execution of the following contracts* for the Paddington Borough Council No. 25B.—Renewal with 8in. or 9in. by 3in. by 5in. creosoted deal wood blocks of existing wood paving in Edgware Road (all materials and labour; about 3,650 super yards). No. 25C.—Renewal with 9in. by 3in. by 4in. West Australian hardwood blocks of existing wood paving in Praed Street (all materials and labour; not more than 5,100 super yards. No. 51.—Purchase of old West Australian hardwood blocks to be taken up from the areas above mentioned. No. 2.—Construction of a sewer with manholes, lampholes, drain connections, and contingent works and accessaries in Queen's Gardens. Printed conditions, specifications, schedule and bills of quantities, and forms of tender may be obtained on application between the hours of 10 a.m. and 4 p.m. (Saturdays 10 a.m. and 1 p.m.) at the office of or by letter addressed to the Borough Surveyor, Town Hall, Paddington, W. In the case of contract No. 52 a payment of £1 must be made for a set of documents. No tender will be considered unless made strictly in accordance with and on one of the printed forms issued, and it must be sealed, endorsed according to the description of contract, and delivered at the Town Hall, Paddington, W., by July 28. Letters of enquiry respecting any of the above contracts should have the number of the contracts written in the left-hand corner of the outside of the envelope.

July 30. Hipperholme.—*Supply of dross and granite* for the ensuing year for the Urban District Council. Tender forms may be obtained from G. Wharton Thompson, surveyor, on or before July 30.

July 30. Settle.—*Supply of a 10-ton steam road-roller*, single cylinder, fitted with attachment for Morrison's scarifier, for the Urban District Council. Further particulars can be obtained from W. A. Stuart, surveyor to the Council, Town Hall, Settle. Sealed tenders, with detailed estimate, and stating date for delivery, marked "Tender for steam roller," must reach T. E. Pearson, clerk, Town Hall, Settle, not later than 12 o'clock noon on July 30.

July 30. East Dereham.—*400 tons (more or less) of $2\frac{1}{4}$in. broken granite and 400 tons (more or less) of $1\frac{3}{4}$in. broken granite*, to be delivered free at East Dereham Station of the Great Eastern Railway Company before the end of November. Forms of tender may be obtained on forwarding a stamped addressed foolscap envelope to H. G. Himson, surveyor, Theatre Street, East Dereham. Sealed tenders, endorsed "Tender for Granite," to be sent to B. H. Vores, clerk to the Council, not later than July 30.

July 31. Lydstep Haven.—*New carriage drive* (1,273 yards long), at Lydstep Haven, Pembrokeshire, for John Wynford Philipps, Esq., M.P. Sealed tenders, endorsed "Lydstep Drive," to be sent in on or before July 31 to H. Thomas, surveyor, 9, Victoria Place, Haverfordwest, from whom plans, specifications, and full particulars may be obtained.

July 31. Mitcham, Surrey.—*600 tons of hard blue Guernsey granite spalls*, to be delivered in such quantities as may be ordered, free of all delivery charges and cartage, to the Workhouse, Western Road, Mitcham, Surrey, for the Guardians of the Holborn Union. The granite must be weighed as sent in, and the Workhouse weighbridge weights charged for. Tenders (by letter) must be delivered to J. A. Battersby, Holborn Union Offices, 53, Clerkenwell Road, E.C., not later than 12 o'clock noon, on July 31.

July 31. West Hartlepool.—*Construction of Bangor Street*, the passage-way leading from Clarence Road to Hart Road, on the north side of "The Willows," and the New Roadway, being diversion of Mainsforth Terrace to the westward, from Grantham Street to the Longhill Sub-way. Plans, sections, and specifications can be seen, and forms of tender, with approximate quantities obtained, upon application to N. F. Dennis, borough engineer and surveyor, Municipal Buildings. Tenders, endorsed "Construction of Streets, &c.," and addressed to the Chairman of the Works Committee, are to be delivered at the office of the Town Clerk, 78, Church Street, not later than 4 p.m. on July 31, 1909.

July 31. Portland.—*About 2,500 tons of $1\frac{1}{2}$in. or 2in. broken granite or basalt*, for the year ending September 1, 1907 Copies of specifications and forms of tender may be obtained at the office of R. S. Henshaw, C.E., engineer and surveyor, Council Offices, New Road, Portland. Sealed tenders, on the forms supplied, endorsed "Horse Fodder," "Team Labour," or "Broken Granite," must be delivered at these offices not later than 12 noon on July 31.

August 1. Widnes. — *Private improvement works* in each of six streets and nine passages situate at Simm's Cross. Plans, sections, and specifications may be seen and forms of tender with bills of quantities obtained at the office of John S. Sinclair, A.M.I.C.E., borough surveyor, Town Hall, Widnes, upon deposit of £2 2s. Tenders, sealed and endorsed "Tender for Private Improvement Works," to be sent, on forms supplied, to H. S. Oppenheim, Town Clerk's Office, Town Hall, Widnes, on or before August 1. Fair wages clause.

August 1. Braintree.—*Supply and delivery at Braintree Railway Station of 300 tons (more or less) of 2in. Leicestershire granite, and 300 tons (more or less) of 2in. Guernsey or Quenast granite and the use of a steam-roller and scarifier* for the Urban District Council. Forms of tender may be obtained on application to H. H. Nankivell, surveyor, Vestry Hall, Braintree. Tenders endorsed "Tender for Granite," or "Tender for Steam Rolling" (as the case may be), to be delivered to H. J. Cunningtón, clerk of the Urban District Council, Braintree, on or before August 1.

August 1. Litherland.—*About 250 tons of the best Welsh macadam, and about 25 tons of granite chippings*, during the ensuing twelve months for the District Council. The macadam and chippings to be delivered at the Alexandra or Langton Dock at such times and in such quantities as may be required. Samples must be forwarded carriage paid to A. H. Carter, surveyor, Public Offices, Sefton Road, Litherland, not later than Aug. 1. Specification and form of tender can be obtained on application to the Surveyor, any morning between 9 and 11 am. Tenders, endorsed "Tenders for Macadam and Chippings," to be sent to J. W. A. North, 15, Lord Street, Liverpool, not later than Aug. 1.

August 4. Saffron Walden.—*Supply and delivery at Saffron Walden Railway Station of about 450 tons of granite macadam*, broken to $1\frac{3}{4}$in. gauge, for the Borough Corporation. To be delivered in such quantities as may be required before March 31, 1907. Samples of granite, with tender, to be delivered to A. H. Forbes, borough surveyor, not later than 12 o'clock on August 4.

August 4. Faversham.—*Supply of 970 tons (more or less) of Cornish granite or Rhenish basalt* broken to a 2-in. gauge, and of 130 tons (more or less) of clean $\frac{1}{2}$-in. Guernsey granite, Cornish granite, or Rhenish basalt chippings free from dust. The material is to be delivered on to the Town Wharf, Faversham, in accordance with the rules and regulations of the wharf, or into carts or trucks, as may be directed by the Borough Surveyor. The whole of the material is to be delivered in such quantities and in such times not later than December 25, 1906, as may be ordered by the Borough Surveyor. Tenders must be accompanied by a sample of each material tendered for, and will not be considered unless so accompanied. Tenders, in sealed envelopes, endorsed "Tender for Road Metal," must be sent to A. Tassell, town clerk, 20, West Street, Faversham, not later than 12 o'clock noon on August 4.

August 6. Armagh.—*Laying a concrete footpath in the new street off Banbrook Hill*, to be known as Little Patrick Street, for the Urban District Council. The approximate quantities are—Kerbing 270ft., Channelling, 270ft., Concreting, 90 sq. yds. The specification can be seen at the office of the town clerk, Tontine, Armagh, on any week-day between 10 a.m. and 2. p.m. Tenders to be addressed to "The Chairman, Urban District Council," and to be delivered to J. Lennon, Clerk of the Council, Armagh, not later than 12 noon on August 6.

August 8. London, N.—*Formation of new road at Muswell Hill.* Plans and sections can be seen and copies of specification obtained upon personal application to Vigers & Co., 4, Frederick's Place, Old Jewry, E.C. Tenders to be delivered to C. J. Hayter, 84, Temple Chambers, Temple Avenue, E.C., before two o'clock on August 8.

August 11. South Shields.—*Constructional work and paving thereto for the carrying out of the permanent way and track*, including steel rails, points, crossings and other auxiliary work for the Boldon Lane and Hudson Street Extension of the South Shields Corporation Tramways, 3 furs. 1·20 chs. double lines, equal to about 6 furs. 2·40 chs. single track for the Tramways Committee. Copies of the specification and quantities, including conditions and form of tender, and also forms of contract can be obtained, and the general and detail drawings seen, at the office of S. E. Burgess, M.Inst.C.E., borough engineer and surveyor, Chapter Row, from whom all further information may be obtained. Tenders, on forms supplied, sealed and endorsed "Tender for Tramways Permanent Way, Boldon Lane Extension," must be delivered to J. M. Hayton, Court Buildings, South Shields, on or before 12 noon, on August 11.

SANITARY.

July 26. Bradford-on-Avon. — *Supply and fixing of sixteen 38ft. diameter revolving sewage distributors at their sewage disposal works*, Bradford-on-Avon; also for the supply of valves and fittings. A copy of the conditions and specification and forms of tender can be obtained of A. S. Wootton, Council's surveyor, Town Hall Chambers, Bradford-on Avon, upon payment of a deposit of £1 1s. Sealed tenders, upon prescribed forms, marked outside "Tender for Sewage Distributors," or "Tender for Valves, &c.," as the case may be, must be delivered or sent to E. Pinckney, J.P., South Wraxall, Bradford-on-Avon, not later than midday, July 26,

July 27. Dunham Massey.—*Construction of the following works of sewerage*, within the township of Dunham Massey:—1,170 lineal yards or thereabouts of 18-inch diameter stoneware pipe and concrete sewer between Lowerhouses and Broadheath; 80 lineal yards or thereabouts of 15-inch diameter stoneware pipe and concrete sewer, and 36 lineal yards or thereaaouts of 15-inch diameter cast-iron pipe and concrete sewer under the railway at the cattle bridge, 500 yards or thereabouts west of the Broadheath station on the L. & N.W. railway, together with all shafts, manholes, and other appurtenant works in connection therewith for the Bucklow Rural District Council. Plans, sections, detail drawings, and specification can be seen, and bill of quantities with form of tender and any other information obtained on application to J. P. Wilkinson, M.Inst.C.E., 301, Cathedral Street, Manchester, and on deposit of the sum of £2 2s. Sealed tenders, endorsed "Dunham Massey Sewerage, Contract No. 4," must be addressed and delivered to G. Leigh, clerk to the Urban District Council, Union Offices, Knutsford, Cheshire, not later than 10 o'clock a.m., on July 27, 1906.

July 30. Chadderton.—*Construction of earthenware and cast-iron pipe sewers*, &c., for the sewerage of the Middleton Junction District. Drawings and specifications may be seen, and quantities, Form of tender, and all other particulars obtained, on application at the offices of James Diggle & Son, civil engineers, Hind Hill Street, Heywood, and 14, Victoria Street, Westminster, S.W., on payment of a sum of £3. Tenders, endorsed "Tenders for Middleton Junction Sewerage, Contract No. 14," to be sent to H. Hoyle, clerk to the Council, Town Hall, Chadderton, not later than July 30.

July 31. Durban (Natal).—*Supply and delivery, "free on board," of two miles, 6in. diameter, one mile 7in. diameter, and two miles 8in. diameter, stoneware sewerage pipes.* Specifications can be obtained from W. H. Radford, C.E., Albion Chambers, Nottingham, consulting and representative engineer to the Corporation, on deposit of £1 1s. Sealed and endorsed tenders must be delivered to Webster, Steel & Co., agents to the Durban Corporation, 5, East India Avenue, Leadenhall Street, E.C., on or before July 31.

August 1. Erdington.—*Sewering and making a new road* (about 445 yards lineal) at Erdington, near Birmingham. Plans and specifications may be inspected, and bills of quantities and form of tender obtained on depositing the sum of £2 with W. Parrott & Antrobus, surveyors, 19, Colmore Row, Birmingham. Sealed tenders, endorsed "Tender for New Road at Erdlington," to be sent to the surveyors not later than August 1.

August 1. Linton.—*Provision, laying and jointing about 1,800 yards of 9in. stoneware pipe sewers*, together with all manholes and lampholes, the construction of a small sewage tank, laying out irrigation area, and other works in accordance with the plans, sections, detail drawings, and specification prepared by the engineers for the Repton Rural District Council. Plans and specifications may be seen, and bills of quantities obtained, of Willcox & Raikes, engineers, 63, Temple Row, Birmingham, on payment of a deposit of £3 3s. Sealed tenders in envelopes supplied endorsed "Linton Sewerage, Contract No. 3," to be delivered to C. F. Chamberlain, clerk to the Council, Union Offices, Burton-on-Trent, not later than 12 noon on August 1.

August 8. Portsmouth.—*Construction of sewers, manholes, pumping station, attendant's cottage and all accessories* in Copnor Road, in the borough of Portsmouth, together with Crossley's gas engines and centrifugal pumps. On payment of the sum of £5, a lithographed copy of the specification, general conditions, and bill of quantities, together with form of tender, can be obtained on application to A. Hellard, town clerk, Town Hall, Portsmouth, and any further particulars can be obtained at the Borough Engineer's office, at the Town Hall, Portsmouth. Tenders, marked "Tender for Copnal Road Sewer and Pumping Station," must be filled up, signed and returned, with the bill of quantities duly filled in, to the Town Clerk, not later than 10 a.m., on August 8. Fair wages clause.

August 14. Spain.—*Execution of drainage works*, in accordance with conditions set forth in the "Gaceta," at the upset price of 102,907 pesetas (about £3,690). A deposit of 5,145 pesetas (about £184) is required to qualify any tender. Tenders will be opened on August 14 at the "Casa Consistorial, 5 Plaza de la Villa, Madrid."

MISCELLANEOUS.

July 26. London, E.C.—*Bearing springs, &c., crank axles, wrought iron, mild steel for smithy and miscellaneous purposes, pig and sheet lead, wood handles*, for the directors of Great Indian Peninsula Railway Company. Specifications and forms of tender may be obtained of J. I. Berry, secretary, Company's Offices, 48, Copthall Avenue, London, E.C., on payment of the fee for the specification. Tenders must be delivered in sealed envelopes, addressed to the Secretary, marked "Tender for Bearing Springs, &c ," or as the case may be, not later than eleven o'clock a.m, on July 26.

July 31. London, E.C.—*Suply* of class C, red and white lead, for the directors of the Bombay, Baroda and Central India Railway Company. Tenders must be made on forms, copies of which, with specifications, can be obtained at the offices of the company, Gloucester House, 2, 3, and 4, Bishopsgate Street, Without, London, E.C., on payment of 5s. each.

August 27. Brisbane.—*Supply of telegraph wire and material, comprising 21¼ tons of copper wire, 200 lbs., H.D.; 4,700 copper tapes for 200 lbs. wire; 4,700 copper binders for 200 lbs. wire; 600 McIntyre sleeves; 5,350 Acme insulators; and 2,386 bolts for arms*, to be delivered at the Post and Telegraph Stores, Brisbane. Schedule forms, specifications, and general conditions may be had at the offices of the Comptrollers of Stores, Brisbane, Sydney, Melbourne, and Adelaide. Tenders sent by post must be registered. Tenders will be received at the office of the Deputy Postmaster-General, Brisbane, up to noon on August 27.

TOO LATE FOR CLASSIFICATION.

July 28. Coventry.—*Erection of new stores at Earlsdon, Coventry, for the Coventry Perseverance Co-Operative Society, Ltd.* Plans and all particulars from the office of G. & I. Steane, architects, 22, Little Park Street, Coventry. Sealed tenders properly endorsed must be delivered to the architects on or before July 28.

July 30. Dairycoates.—*Erection of a signal cabin* at Dairycoates, near Hull, for the North Eastern Railway. Plans, specification, quantities and indenture may be seen at the offices of J. W. Cudworth, company's engineer, at York, or district engineer, E. Smith, at Paragon Station, Hull, where detailed quantities and form of tender may be obtained on personal application. Sealed tenders, marked "Tender for Signal Cabin at Dairycoates," to be sent to the engineer, J. W. Cudworth, at York, not later than July 30.

August 3. Withernwick.—*Additions and alterations to the offices, &c., at the Council School, Withernwick.* Persons desirous of tendering for the work may see the drawings, specification, and obtain forms of tender on application to the Building Surveyor, County Hall, Beverley, or at the above school during the usual hours. Tenders, endorsed "Withernwick School," to be forwarded not later than August 3, to J. Bickersteth, clerk to the East Riding Education Authority, County Hall, Beverley.

July 28. Mountmellick.—*Erection of labourers' cottages and fencing plots of same* for the R.D.C.—namely, 1 Cottage in Townland of Kilmainham in the electoral division of Shaen. 1 Cottage in Townland of Tinnakill in the electoral division of Coolrain. Tenders to be considered on July 28. For further particulars see placards, which can be had on application to R. Goodbody, clerk of the council, District Council Office, Mountmellick.

SOCIETY OF ARCHITECTS' DINNER.

The Twenty-second Annual Dinner of the Society of Architects was held on Thursday last at De Keyser's Royal Hotel, Victoria Embankment, London, E.C., the president (Mr. Albert E. Pridmore), occupying the chair. Among those present were:—

Sir T. Vansittart Bowater, Sheriff; Alexander Ritchie, J.P., Chairman of the City Lands Committee; Alderman Sir Henry E. Knight, past Lord Mayor; Alderman Sir Horatio Davies; Mr. S. W. Perks, City Surveyor; Mr. C. Welch, City Librarian; Masters of the Worshipful Companies of Tylers and Bricklayers, Painters, and Carpenters; Mr. James Bell, Town Clerk; Mr F. Sumner, City Engineer; Sir T. Brooke Hitching; Archdeacon Sinclair; Very Rev. Dean Vere; Mr. G. L. Gomme, Clerk, London County Council; Mr. W. E. Riley, Architect, London County Council; Mr. L. A. Atherley-Jones, K.C., M.P., Mr. T. B. Silcock, M.P., Mr. H. Greville Montgomery, M.P., Mr. J. S. Fletcher, M.P., Mr. Donald Maclean, M.P., Mr. W. C. Lorden, President of the Master Builders' Association; Mr. E. Dru Drury, F.R.I.B.A., President District Surveyors' Association; Mr. Edward Holmes, President Sheffield Society of Architects; Mr. Thomas Cooper, F.R.I.B.A., President Birmingham Architectural Association; Mr. James M. Monro, F.R.I.B A., President Glasgow Institute of Architects; Mr. R. G. Wilson, A.R.I.B.A., President Aberdeen Society of Architects; Mr. Harold O. Tarbolton, F.R.I.B.A., President Edinburgh Architectural Association; Mr. E. O. Sachs, Chairman British Fire Prevention Committee; The Lord Mayor of Dublin, and the Mayors of Finsbury, Fulham, Holborn, and Stoke Newington; Mr. A. C. Scovell, J.P., Chairman Metropolitan Asylums Board; Sir R. Melville Beachcroft, Chairman Metropolitan Water Board, and the Consul-General of Japan.

After the loyal toasts had been given by the president, Mr. Alexander Ritchie, J.P., proposed the toast of "The Houses of Parliament," which was responded to by Lord Stanley of Alderley and the Right Hon. James Bryce, M.P., Chief Secretary for Ireland, the latter, referring to the fact that the Victorian era had produced no definite school of architecture. In the cities, he feared, too much had been left to chance, the whole aspect of the streets having been spoilt for reasons which could have been avoided if street building had been carried on under the management of a competent body. The Government and local authorities were now alive to the importance of the matter, and he trusted that there would grow up a twentieth-century style of architecture the merits of which would be appreciated by posterity.

The next toast, that of "The London Local Authorities," was proposed by Mr. R. Frank Vallance, F.R.I.B.A., vice-president, and Mr. Deputy Wallace, replying for the City, said he hoped the services of the gentlemen present would be asked for in connection with the widening of Blackfriars Bridge for the extension of the tramway system of the London County Council. The Mayor of Holborn also replied.

The toast of the evening, "The Society of Architects," was proposed by Lord Monkswell, and the President, in response, said that the history of the Society, which had now existed for 22 years, was the history of the movement in favour of the Statutory Registration of Architects. They had to thank Lord Monkswell for introducing the Bill on previous occasions. The Society had not advanced by leaps and bounds, but had made steady progress, and now had a membership of over 800. Early in the year they instituted a Travelling Studentship which attracted a large number of entries, and resulted in many excellent designs being submitted. During the year the Council have instituted a Distributing Library. This was most valuable for provincial members, who could have the books sent them by post. Their membership was not limited to the United Kingdom, and recently branches had been established in India and Africa.

The toast of "Our Visitors," which was proposed by Mr. G. A. T. Middleton, A.R.I.B.A., vice-president, was responded to by Judge Rentoul and Mr. Thomas Cooper, F.R.I.B.A., president of the Birmingham Architectural Association.

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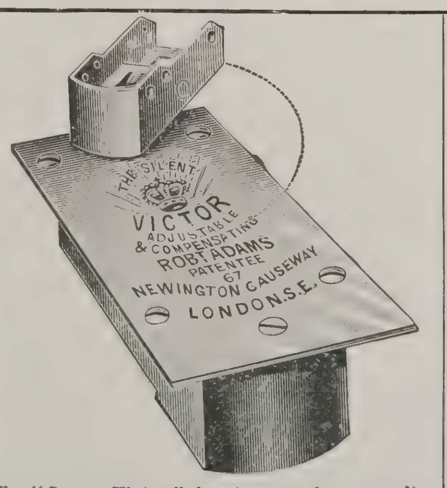

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New London Buildings

At yesterday's meeting of the London County Council the Building Act Committee reported the following applications under the London Building Act, 1894, their recommendations as to consent or refusal being appended in *italics* :—

Erection of balconies, oriels and a projecting hood at Nos. 108 to 111, Fleet Steet, City, on the application of Messrs. Smee and Houchin, on behalf of Messrs. T. Cook and Son. *(Consent.)*

Erection of buildings on the south-western side of Farm Lane, Walham Green, on the application of Messrs. A. Krauss and Son, on behalf of the London and District Motor 'Bus Company, Limited. *(Consent.)*

Erection of four houses on the northern side of Hannington Road, Fulham, with flanks abutting upon Napier Avenue, Ranelagh Avenue and Cromwell Avenue, on the application of Mr. A. Dawkins, on behalf of Mr. R. B. Mason. *(Consent.)*

Erection of an office building on the northern side of Great Church Lane, Hammersmith, over the Metropolitan District Railway, on the application of Mr. C. H. King, on behalf of the Metropolitan District Railway Company. *(Consent.)*

Erection of additions at the rear of No. 22, Pembroke Road, South Kensington, to abut upon Pembroke Villas, on the application of Mr. G. M. Silley, on behalf of Professor G. Moira. *(Consent.)*

Completion and retention of a dwelling-house adjoining No. 106, Bargery Road and of a dwelling-house adjoining No. 113, Inchmery Road, Catford, with the flanks of such houses abutting upon Thornsbeach Road, on the application of Messrs. Norfolk and Prior, on behalf of Mr. J. Watt. *(Consent.)*

Retention of a projecting porch in front of Bute House, Avenue Road, Hampstead, on the application of Mr. A. F. Faulkner, on behalf of Mr. W. Willett. *(Consent.)*

Erection of two projecting hoods at Nos. 53, 54 and 55, Berners Street, St. Marylebone, on the application of Mr. L. A. Hayes, on behalf of Messrs. A. Sanderson and Sons. *(Consent.)*

Erection of buildings on the western side of Caldecott Road, Coldharbour Lane, Norwood, with flanks abutting upon Bavent Road and Venetian Road, on the application of Mr. A. A. Carter. *(Consent.)*

Erection of an oriel window in front of No. 125B, Mount Street, St. George, Hanover Square, on the application of Mr. H. P. Monckton, on behalf of Mrs. J. Miller. *(Consent.)*

Retention of a hoarding abutting upon Woodwell Road and North Side, Wandsworth Common, Wandsworth, on the application of Mr. C Brawn. *(Consent.)*

Erection of a projecting one-storey shop in front of No. 38, Brookwood Road, Wandsworth, on the application of Mr. H. G. Leslie, on behalf of Mr. J. W. Blackwell. *(Consent.)*

Erection of porches to nineteen houses on the southern side of Upper Tooting Park, Upper Tooting, eastward of Trinity Road, on the application of Mr. W. C. Poole, on behalf of Mr. F. Eaton. *(Consent.)*

Retention of a boundary wall and gates in the yard in front of a two-storey addition at the relief office of the Greenwich Union, Mary Ann's Buildings, High Street, Deptford, at less than the prescribed distance from the centre of Mary Ann's Buildings, on the application of Mr. L. Jacob, on behalf of the Guardians of the Greenwich Union. *(Consent.)*

Erection of a building upon the site of Nos. 61 and 63, Loampit Vale, Lewisham, at less than the prescribed distance from the centre of the roadway, of Shrubbery Road, on the application of M. A. W. Osborn, on behalf of Messrs. G. A. Harvey and Co. *(Consent.)*

Erection of a urinal on the western side of North Wharf Road, Paddington, at less than the prescribed distance from the centre of the roadway of such street, on the application of Mr. E. B. B. Newton, on behalf of the Paddington Metropolitan Borough Council. *(Consent.)*

Erection of a one-storey addition at No. 21, Cumberland Mews, Regent's Park, at less than the prescribed distance from the centre of Cumberland Mews, on the application of Messrs. E. J. Saunders & Co., on behalf of Mr C. B. Ullathorne. *(Consent.)*

Erection of a projecting flue to the Savoy Hotel extension on the northern side of Somerset Street, Strand, on the application of Messrs. Collcutt & Hamp. *(Consent.)*

Erection of houses with shops upon a site at the corner of Cassland Road and Brookfield Road, Victoria Park, Hackney, on the application of Mr. G. H. Lovegrove, on behalf of Mr. G. S. Shaw. *(Refusal.)*

Erection of a building on the eastern side of Willow Vale, Uxbridge Road, Hammersmith, on the application of Mr. A. G. Channer, on behalf of Mr. J. Watt. *(Refusal.)*

Erection of a mortuary building on the southern side of Ram Square, York Road, Wandsworth, on the application of Mr. H. G. Hills, on behalf of the Wandsworth Metropolitan Borough Council. *(Refusal.)*

Erection of an addition to Nos. 28–32, Victoria Street, Westminster, to abut upon Great Chapel Street and Dacre Street, on the application of Messrs. Griffin & Woollard, on behalf of the Westminster Trust, Ltd. *(Refusal.)*

Retention of a shed at the rear of No. 129, Camden Road, St. Pancras, abutting upon Sandall Road Mews, on the application of Mr. B. Douthwaite. *(Consent.)*

Retention of a shed of a temporary character on the eastern side of Queen's Road, Battersea, southward of No 324, on the application of Mr. J. L. Williams. *(Consent.)*

Erection of a wood and iron church on the southern side of Darnley Road, Hackney, on the application of Messrs. J. Harrison & Co., on behalf of Mr. H. P. Ford. *(Refusal.)*

Erection of an iron and glass conservatory on the rear portion of the roof of the Bath Club, to abut upon Berkeley Street, St. George, Hanover Square, on the application of Mr. J. Johnson, on behalf of the directors of the Bath Club Company. *(Consent.)*

Erection of a building to abut upon Tower Bridge Road and Grange Walk, Bermondsey, on the application of Messrs. Barlow, Roberts & Thompson. *(Consent.)*

Modification of the provisions of that section with regard to open spaces about buildings so far as relates to the proposed erection of a private hotel over the Lancaster Gate section of the Central London Railway, Stanhope Terrace, Bayswater Road, Paddington, on the application of Mr. D. Joseph. *(Consent.)*

Modification of the provisions of section 41 of the Act with regard to open spaces about buildings so far as relates to the proposed erection of an addition at the rear of No 4, Fulborne Street, Whitechapel, on the application of Mr. C H. King, on behalf of the Metropolitan District Railway Company. *(Consent.)*

Formation of new streets for carriage traffic to lead out of the south side of Leahurst Road, Lewisham, to Fernbrook Road, so far as relates to an alteration in the position of the boundaries of a portion of Fernbrook Road, near its junction with Staplehurst Road, on the application of Mr. E. H. Harrison, on behalf of Mr. J. Johnson. *(Consent.)*

Formation or laying out of a new street for carriage traffic to lead from Trinity Road to Norwood Road, Lambeth, so far as relates to an alteration in the gradients of the proposed street, on the application of Mr. C. Death. *(Consent.)*

Formation of three new streets for carriage traffic upon the Magdalen Park estate, Wandsworth, on the application of Holloway Bros. *(Consent.)*

Construction of a motor generating-station at Eccleston Place, St. George, Hanover Square, on the application of Mr. C. S. Peach, on behalf of the Westminster Electric Supply Corporation. *(Consent)*

Ayrshire Sanatorium, erected on the banks of Afton Water, was opened recently. The plans were prepared by F. E. Jones, of London, and the building erected by Mr. Allan Stevenson, of Ayr. The total cost was about £10,000. The accommodation is at present limited to 14 beds.

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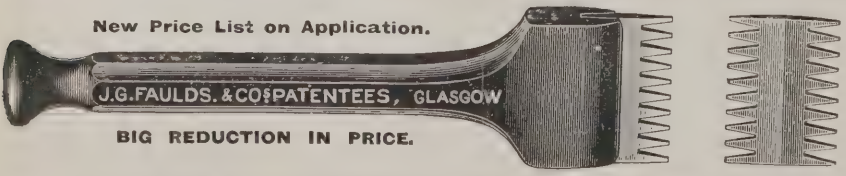

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Bankruptcies.

Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—adjudication.

During the week ending July 20th twenty-three failures in the building and timber trades in England and Wales were gazetted.

G. How, builder, East Sheen. R O. May 3.

H. G. Lane, builder, Orpington. Adj. July 13.

W. Meadows, builder, Greenwich. R.O. July 11.

Burgess Brothers, builders, Westbury. R.O. July 14.

H. Taylor, engineer, Barrow-in-Furness. R.O. July 14.

W. R. Harrison, consulting engineer, Hull. R.O. July 10.

D. Charles, builder and haulier, Llantarnam, Mon. R.O. July 10.

S. W. Gibbs, builder, Charlwood. P.E., Croydon C.C., Aug. 15, at 11.

W. Price, builder, Brecon. Gross liabilities, £415; deficiency, £325.

A. Wright, builder, Yarmouth. Gross liabilities, £406: assets, nil.

G. Crouch, builder, Hockley. Liabilities, £900; assets, £15. P.E., Aug. 15.

T. H. Scutt, architect and surveyor, Brighton. Liabilities, £1,618: assets £778.

T. McIsaac, builder and contractor, East Sheen. P.E., Wandsworth C.C., Aug. 2, at 12.

T. Cook, plumber and gasfitter, Scunthorpe. P.E., Townhall, Great Grimsby, Aug. 2, at 11.

F. W. Atterbury, builder, Kensington. P.E., London Bankruptcy Court, Aug. 2, at 3. R.O. July 10.

Lucius & Worsley, builders, Oldham. Unsecured creditors, £896; fully secured creditor, £1 035.

T. Hilton (deceased), paint merchant, Bolton. First meeting, 19, Exchange Street, Bolton, July 25, at 3.

A. Henry & Co., architects and surveyors, London, E.C. P.E., London Bankruptcy Court, Aug. 21, at 11. R.O. July 9.

R. E. Cole, contractor, Tottenham. First meeting, 14, Bedford Row, W.C., July 26, at 12. P.E., Edmonton C.C., Aug. 13, at 11.30.

F. A. Simons, builders' merchant, Gravelly Hill. First meeting, 191, Corporation Street, Birmingham, July 26, at 11. P.E., Birmingham C.C., Aug. 15, at 2.

F. Mullins, plumber and decorator, Twickenham. First meeting, 14, Bedford Row, W.C., July 25, at 3. P.E., Town Hall, Brentford, Aug. 17, at 11. Adj July 11.

G. Topp, builder, Hickley. First meeting, O.R.'s, Leicester, July 25, at 3. P.E., The Castle, Leicester, Aug. 17, at 10. R.O. July 10. Unsecured liabilities, £93; assets, £15; deficiency, £78.

Coming Events.

Wednesday, July 25, to Tuesday, July 31.

British Archæological Association.—Congress at Nottingham.

Saturday, July 28.

Northern Architectural Association.—Visit to Stockton.

Wednesday and Thursday, August 1 and 2.

North of England Institute of Mining and Mechanical Engineers.—Excursion Meeting at Newcastle-on-Tyne.

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ADVERTISER (39), thorough knowledge of marble and granite, desires position as REPRESENTATIVE; good connection with Architects and leading Contractors; references.—W. G. Renwick, 1, Lennard Road, Penge, S.E. 1937

ARCHITECT and CIVIL ENGINEER'S ASSISTANT desires engagement with view to partnership, or would take over business of one retiring. 11 years practical experience of sewage, water and architectural works, quantities, surveying, levelling, etc.—Write S.H., "Lindum," Woodcote Road, Caversham, Oxon. 1978

ARCHITECT and SURVEYOR'S ASSISTANT requires engagement; competent; working and detail drawings, specifications, land surveying, &c.; London and country experience; excellent references.—Box 1973, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT and SURVEYOR; young; is prepared to assist in the preparation of contract or competition drawings; surveys made for alterations and dilapidations; 10 years' London Ex.—E. C., 100, Archway Road, N. 1976

ARCHITECT & SURVEYOR'S ASSISTANT desires engagement; 13 years' experience; first-class draughtsman; working and detail drawings, surveys, specifications, and general routine; excellent references.—A..R., Hazelmere, Rusham Road, Egham. 1964

ARCHITECT AND SURVEYOR'S ASSISTANT desires engagement; architect, surveyor, or builder's office, 10 years' experience; Sanitary Institute Diploma; plans, specifications, general superintendence, land surveying, levelling.—C., 10 Rollscourt Avenue, Herne Hill, S.E. 1991

ARCHITECTURAL ASSISTANT (27) desires re-engagement; nine years' varied London and Provincial experience; design, details, working drawings, perspective, &c.; excellent testimonials; moderate salary.—Address Box 1959, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT'S ASSISTANT (21).—Three years' good experience; good references; can prepare complete working and detail drawings from rough sketches; good designer, perspectives, tracing and colouring.—H. J. W. E., 2, Stone Villas, Camberwell Grove, S.E. 1947

ARCHITECT'S ASSISTANT (22) desires appointment: salary not chief consideration; varied experience, hard worker; Prob. R.I.B.A., shorthand.—"W." 41, Coventry Road, Ilford. 1971

ARCHITECTURAL assistant (27); nine years' experience London and provinces; designs, working drawings, details, perspective surveys; assist quantities; excellent references and testimonials. Salary very moderate.—A.R., 85, Durham Rd., East Finchley, N. 1977

ARCHITECT'S JUNIOR ASSISTANT desires engagement, commencing July 30; competent.—R. S. Bowers, 46, Newington Butts, London, S.E. 1953

ARCHITECTS' JUNIOR ASSISTANT, age 21, requires situation; good general experience in provincial office. Reference and specimen. Box 1968, Builders' Journal Office, 6, Great New Street, E.C.

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BUILDER'S ASSISTANT or estate clerk of works; life experience; age 30; 4 years in present situation (Admiralty); quantities, estimating, plans, &c.; good organiser and manager of men; references.—344, Canterbury Road, Gillingham, Kent. 1975

BUILDER AND CONTRACTOR'S ASSISTANT (28), 12 years' experience, last seven with large London firm; efficient in prime cost and all departments; excellent references.—Box 1989, Builders' Journal Office, 6, Great New Street, Fetter Lane E.C.

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DECORATIVE SALESMAN OR MANAGER (age 46) seeks engagement; good West-end experience in estimating and superintending; highest references.—Address B. A., 16, St. Michael's Road, Stockwell, S.W. 1955

DRAUGHTSMEN–Good general experience Working drawings and details. Perspectives in colour, attractive sketches, &c. Measuring and plotting. Quick, accurate and artistic. Moderate salary.—Y, 2, Beresford Road, Highbury. 1961

DRAWINGS from rough sketches, designs, details, specifications, drain plans and quantities prepared; terms moderate.—J. W., 8, Rylett Crescent, Shepherd's Bush, W. 1967

FOREMAN CARPENTER or GENERAL FOREMAN, good man, experienced large jobs and good-class work, and as Shop Foreman, wants job, anywhere.—G. R. Briarfield, Carlton Avenue, Prittlewell, Southend. 1990

FOREMAN PAINTER (Working), age 36, seeks Re-engagement or Piecework. Last reference eight years with big firm; used to contract work.—J. A., 88, Beryl Road, Hammersmith, W. 1982

GENERAL FOREMAN DISENGAGED; thoroughly capable and experienced in all trades; good manager and timekeeper; town or suburbs; carpenter and joiner; good references, 47—Foreman, 30 Bolton Road, West Ham, E. 1988

GENERAL FOREMAN (45), Life experience new and alterations; 16 years with present employer; largest in Eastern counties; seeks re-engagement; good manager of men; highest possible architects', engineers' and builders' references.—Box 1965, Builders' Journal Office, 6, Great New Street, London, E.C.

GENTLEMAN, good appearance and address; nine years' experience in building trade; desires engagement as TRAVELLER in Kent and Sussex to good firm.—F. J. L., 53, Maidstone Road, Chatham. 1957

HEAD or WALKING FOREMAN DECORATOR wants situation; thoroughly practical in all branches; over twenty years' West End work; arabesque, painter, gilder, &c.; highest references.—W. Hatherley, 13, Grove Cottages, Manor Street, King's Road, S.W. 1974

MACHINIST (24) wants JOB; good experience; overhand thickness, circular bandsaw, etc.; good reference; sharpen saws (gas engine).—W. Luff, 19, Ashdown Street, Queen's Crescent, Kentish Town, London, N.W. 1945

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PART-TIME ASSISTANCE to Builders and Contractors in quantities, variations, estimates, drawings and accounts by practical builder's clerk.—C., 61, Sydenham Road North, Croydon. 1946

PLUMBER, well up in latest sanitary and lead laying, new or jobbing; can do H.-water if required; good refs.; town or country.—Moore, 95, Victor Road, College Park, London, N.W. 1979

QUANTITY SURVEYOR'S ASSISTANT open to re-engagement, temporary or permanent. Present employers fourteen years. Taking off and measuring up. Thoroughly experienced. Terms moderate.—Apply W. H. C., 18, Calabria Road, Highbury, London, N. 1966

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TO BUILDERS & OTHERS.—Designs, working drawings, specifications, estimates prepared for all classes of work.—Box No. 1963, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

WANTED by an A.R.I.B.A., a position as Surveyor, Clerk of Works, Estate Agent, Steward, &c.; has had great experience in architecture and surveying: first-rate testimonials.—Apply Box 1944, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

WORKING SHOP FOREMAN of JOINERS seeks re-engagement; good manager of men and machinery; accurate setter-out; seven years' experience; abstainer. first-class references; age 32.—Apply J. E. Amos, 9 Martyr's Villas, Canterbury. 1956

YOUNG MAN used to GENERAL BUILDING WORK, seeks sit; moderate wages; distance no object.—J. James, 42, De Beauvoir Crescent, Southgate Road, London, N. 1980

Appointments Vacant.

ARTICLED PUPIL.—VACANCY for same in old-established London Architect and Surveyor's office—Box 1816, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

FIBROUS PLASTERING.—Steady energetic man, capable of taking entire charge of FACTORY about to be opened; applicants must have a long and up-to-date experience in above-named line.—Address, giving fullest particulars as to experience, references, salary, etc., Box 1952, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

JUNIOR CLERK WANTED in Builder's office; age about 16; must be methodical; one with knowledge of shorthand preferred; good opportunity for smart boy. Apply by letter, stating qualifications and experience.—M. & P., 165, Gray's Inn Road, W.C.

WANTED, EDUCATED YOUTH, 16–20, for Builder's Office; knowledge of correspondence, re-selling and letting houses (preferred); also shorthand and typewriting, but not essential; salary according to experience.—Write, in first instance, to Wastnage, 39, Briardale Gardens, Hampstead. 1958

Drawings, Tracings &c.

AN ARTIST and DRAUGHTSMAN is prepared to undertake Architectural Drawings or Designs for manufacturing firms, either in office or at home. Perspectives, Illuminated Addresses, &c.—E.S.B., Box 1813, Builders' Journal Office, 6 Great New Street, Fetter Lane, E.C.

ARCHITECTURAL ASSISTANCE.—DRAWINGS, TRACINGS, SURVEYS. PERSPECTIVES, &c., prepared at moderate charges. Photo copies.—C. Boswell, 52, Gray's Inn Road, W.C.

ASSISTANCE rendered in the preparation of Architectural Drawings, &c., at advertiser's own address.—Box 1717, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

PERSPECTIVES and DESIGNS expeditiously executed.—Lewis Mander, 83, Sandmere Road, Clapham, S.W. 1954

QUANTITIES AND SPECIFICATIONS ESTIMATES. (Nominal fee if unsuccessful.) Experienced General Assistance, Competitions, Designs, Contract, Detail, and Working Drawings.—Address, Quantity Surveyors, 21, Liverpool Street, E.C.

Miscellaneous.

"BUILDING NEWS" PLATES, selected, 9 vols. specially bound, under headings; also photos of human figure and ¼-plate Frena camera; accessories; cheap.—Apply Box 1984, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

FACTORY.—Splendid FREEHOLD SITE of 3 to 20 acres, adjoining navigable river, centre of market town, near railway; gas, water, and electric light available.—Ginn & Son, Luton Archway, Chatham.

SECOND-HAND OPTICAL MART for the Purchase and Sale of LEVELS, THEODOLITES, DRAWING INSTRS.—Clarkson's, 338, High Holborn, London, W.C. (opposite Gray's Inn Road).

TO TILE MAKERS.—REQUIRED quantity of plain Yorkshire TILES for tile creasing: delivered London station.—Turner & Sons, Goods Station, Shepherd's Bush.

SEE PAGES XXI AND XXII FOR EMPLOYMENT REGISTER.

THE BUILDERS' JOURNAL

AND ARCHITECTURAL ENGINEER.

July 25th, 1906.

CONTRACTORS' SUPPLEMENT (MONTHLY).

SPEED.

By James F. Parker,

Managing Director of Patman & Fotheringham, Ltd.

Speed in the construction of buildings is recognised as a very important factor in the building trade.

To manufacturers who are rebuilding or enlarging their factories the time taken by the builders in completing the work means a great deal, both financially and otherwise, and contractors with reputations for quick work hold a big advantage over their competitors in cases where time is the essence of the contract.

The work of preparing estimates is extremely important in these cases, and requires great care on the part of the estimator entrusted with the task of pricing the job. Apart from the everyday difficulties, requiring special experience and knowledge, he has to take into account the extra cost entailed by night work, and the many other items of expense incidental to hurried contracts.

It is often said that nothing of importance can be done without a system, and this applies with much force to the building trade, especially in regard to the quick execution of contracts. Good system, coupled with keen management and proper supervision, is essential in achieving the object aimed at. It is also absolutely necessary to have a good foreman, as so much depends on the man in charge of the job.

What Constitutes a "Good" Foreman ?

is a question that is often raised. In the first place, he must be well acquainted with the different branches which go to make up the building trade and have had a practical training and experience in one trade.

He must be "master" of the men under him, and able to get the best out of them—not necessarily by "driving" methods, but by firmness and tact. A weak man never earns the respect of the workmen under him, which is so important to the smooth running of a job, be it a quick one or not. Many would-be foremen have failed owing to the want of this faculty of managing men, although they may be good and efficient tradesmen. Many leading hands in the various trades are useless as general foremen, and cannot organize or direct and carry out the work unless under the personal supervision of a good foreman.

A good foreman always looks well ahead and orders materials, &c., well in advance, so that the job may not be kept waiting when the time comes for them to be fixed. In fact, a foreman must not put off till the morrow what he can do to-day.

In Dealing with the Difficulties

that naturally arise in building operations, a great amount of tact is required from the foreman, and in adjusting and putting these right, gives him the opportunity of proving his worth. The old saying that good masters make good workmen applies to foremen, for a good foreman can always command good workmen who can do a fair day's work. A slack foreman never gets the best out of the men under him, and therefore handicaps himself in consequence, as this incurs an increased amount spent in wages (on which most builders keep a sharp eye), and thus retards his future prospects of undertaking important contracts.

Opinions Differ

in the building trade as to whether a bricklayer or carpenter makes the best foreman, but this depends much on the man himself, though carpenters seem to be in the majority amongst foremen. In cases of large electric light works and contracts of a similar nature where the work is chiefly brickwork it naturally follows that a bricklayer foreman is usually more fitted to take charge.

American contractors made a big fuss some time ago about the large quantity of bricks laid by their men during the erection of the large building works in Manchester. I was glad to see their statements did not go unchallenged; for there are, without a doubt, bricklayers in London quite capable of competing with anyone as to speed and workmanship in laying bricks.

In erecting the electric light works at Marshgate Lane, Bow, we used some millions of bricks, and the accompanying illustrations give a slight idea of the size of the job—the condensing towers being rather conspicuous.

Night Work

is a large feature in cases where the time for executing large contracts is short.

It is naturally assumed that work is carried on with more difficulty during the night, as artificial light on large buildings is not altogether satisfactory, notwithstanding the aid of the recent acquisition to the trade of arc lamps and other improved means of lighting.

Accidents.

It seems strange that fewer accidents happen in night gangs than occur during the day. This is, no doubt, explained by the men being more careful, well knowing there is always more risk of a slip on his part than at any other time.

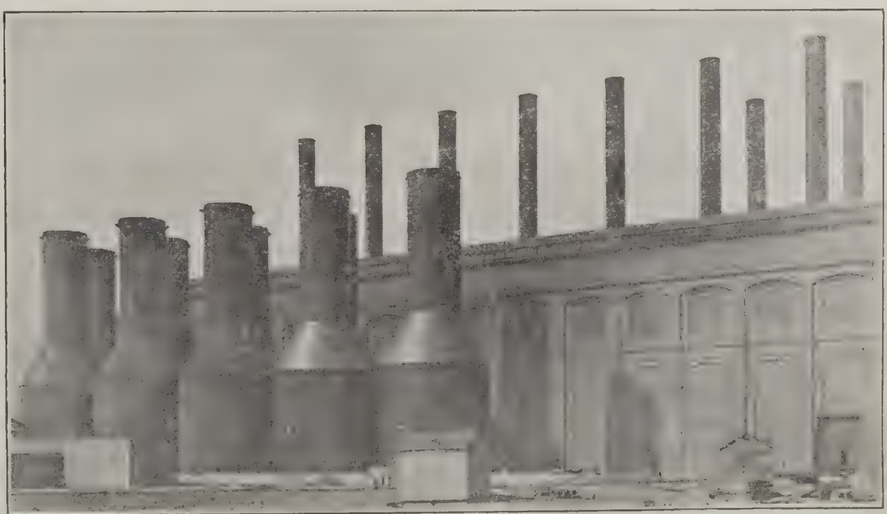
In carrying out the completion of the London Coliseum in seven months (we used over one and a-half million bricks) time was an all-important factor, and jobs of this size must necessarily be attended with difficulties which have to be surmounted, and can only be done with the aid of a large night gang, so that the work can proceed with all speed by night as well as by day.

Co-operation of Sub-Contractors.

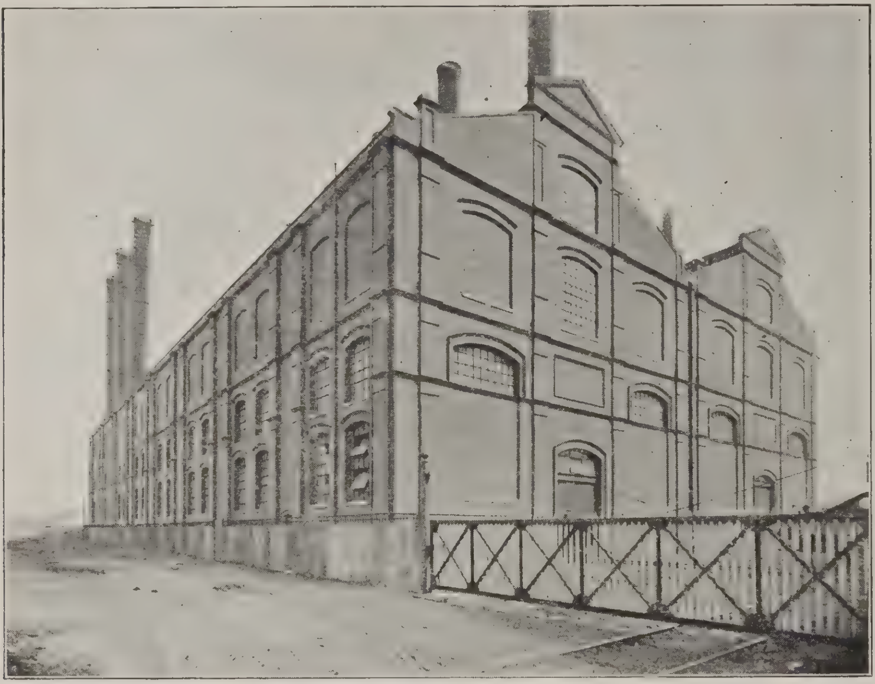
All builders know full well the trouble which arises from non-delivery at the proper date of this or that speciality which has or has not been specified. Nothing hampers and delays a job so much as this, and the co-operation of all the sub-contractors is, therefore, a *sine quâ non* in getting a job completed quickly.

Electric cranes and other modern time-saving appliances all do their part in the effort to get contracts done with such promptitude.

Last year the writer's firm were engaged by the Admiralty to erect the boy-artificers' workshops and the gunnery school for sub-lieutenants at Whale Island, and to illustrate the speed with which modern building operations could be carried out. This building has two storeys and is 256ft. long, 27ft. wide, and 34ft. high, with the cubical contents of 215,000ft. and comprises 100 rooms and requisite bath-rooms. The building was completed under most difficult and exceptional circumstances in the short space of six months from the commencement, and the writer's firm



ELECTRICITY GENERATING STATION, BOW, LONDON, E., FOR THE CHARING CROSS AND STRAND ELECTRICITY SUPPLY CO



ELECTRICITY GENERATING STATION, BOW, LONDON, E.

received the compliments of the Board of Admiralty upon the excellence of the work and the promptitude of its execution.

Party Wall Disputes

and questions of light and air are some of the chief difficulties builders have to contend with in their exertions to execute work within contract time. What builders have not had the annoying experience of having their building stopped for weeks owing to these questions? The recent decision in the Colls *v.* Home & Colonial Stores, has, I am glad to say, eased matters over as regards the rights of adjoining owners as to light and air. This is helpful to builders in general. It naturally does not suit builders to have to shut up the job or slacken down because of some question such as the above, and the fewer points there are left open to dispute the better it is for the building trade.

In these days of keen competition a good system of

Bookkeeping

is all-important, and all builders have to pay special attention to their books. Opinions differ considerably in the trade upon the advantage of this or that system, but whatever methods are adopted all must have their prime cost book, which is invaluable as a means of keeping a summary of the total wages, as also the cost of cartage and materials, &c., supplied to each job. By referring to his P.C. book the builder is able to ascertain the result of the different contracts, and to fairly accurately gauge whether he is losing or making money on any particular one during the progress of the work.

Joinery books have also to be kept showing the cost of the work in the shops, and the different totals can thus be easily transferred to the P.C. book.

The Checking of Invoices and Accounts

is very important, requiring, as it does, great care and accuracy on the part of the invoice clerks and the staff responsible for this branch of the indoor work. The system of wages sheets and mode of paying is much the same throughout the trade, the sheets being made up to Friday night and sent in by the foreman to the office early Saturday morning. It is customary for the foreman in the space on the sheet to enter up all materials received on the job, specifying the date and from whom received and also particulars as to the quantity, &c., and this information serves a useful purpose as a means of checking.

Builders' Notes.

Irish Granite and Marble.—The works and quarries of the Galway Granite Co., and Marble Works, Ltd., were opened by the Lord Lieutenant of Ireland and the Countess of Aberdeen last week.

Messrs. J. & R. Corker, of Ferham Works, Rotherham, manufacturers of the "Drawwell" grate, gained the medal for smoke abatement, heating power, fuel economy and suitability for public and private buildings at the recent sanitary exhibition held at Bristol in connection with the congress of the Royal Sanitary Institute. Messrs. Corker's London showrooms are at Saracen's Head Buildings, Snow Hill, E.C., where the "Drawwell" grate can be seen in action.

Shields Municipal Buildings: Dispute with Contractors Settled.—At a special meeting of the South Shields Town Council last week a report was received from the Municipal Buildings Committee in reference to the dispute between the Corporation and the contractors for the new municipal buildings, Messrs. Neill & Sons, of Manchester, regarding certain mortar and materials used in the buildings, work on which has been suspended for some months. The report stated that the subject of the dispute had been under the consideration of Sir Alexander Binnie and Mr. Hurtzig, as experts, and the contractors, while denying any liability whatever, had agreed to a suggestion made by the experts that they should carry out certain works as a solution of the difficulty. The Council were recommended by the committee to accept this, which they did. The action commenced by the contractors against the Corporation will be discontinued, each party will pay its own costs, and all claims for delay will be waived.

The Labour Market

Board of Trade Returns for June.

The Board of Trade returns show that employment in the building trades was on the whole dull and about the same as a month ago. With bricklayers, however, there was an improvement, and painters were well employed generally. Compared with a year ago employment was, on the whole, better.

As regards London

employment on the whole showed a decline as compared with a month ago, and was rather worse than a year ago. Returns received from fifty London employers show that in the last week of June they paid wages to 8,855 workpeople of all classes, as compared with 9,112 in May last, and 10,947 in June, 1905.

As Regards the Provinces

the returns received from 74 employers associations in towns outside of London show that employment in these towns was quiet generally.

The following statements relating to employment in the provinces of England and Wales and in Scotland and Ireland are based on returns received from trade unions.

With bricklayers employment was dull generally, but showed some improvement compared with a month ago.

With carpenters and joiners it was slack, the percentage of trade union carpenters and joiners unemployed being 5·4 as compared with the same percentage in May and 6·7 a year ago.

With plumbers it showed little change.

With masons it continued slack.

With plasterers it was bad, but slightly better than a month ago; in Scotland, however, it was worse.

With painters it was not so good as in May.

With slaters and tilers it was fairly good in Scotland.

Northern Counties.

On the north-east coast employment with bricklayers and masons and joiners showed some improvement. With painters it was good.

Yorkshire, Lancashire, and Cheshire.

In Sheffield employment on the whole was rather better than a month ago, except with plumbers and plasterers, with whom it continued slack. In Lancashire and Cheshire generally employment was fairly good.

Midlands and Eastern Counties.

At Wolverhampton employment was bad in all branches. At Nottingham employment generally was dull. At Leicester and Northampton bricklayers and plumbers reported some improvement. At Norwich painters were well-employed.

Southern Counties.

Employment showed little change compared with a month ago, except in the Plymouth district, where it was rather worse.

Wales and Monmouth.

Employment with bricklayers, masons, and plumbers was fair, and better than a month ago. With painters it was good.

Scotland.

At Glasgow bricklayers, joiners, masons, and slaters reported an improvement. At Edinburgh employment generally was fair. At Dundee employment with plasterers improved; slaters were well employed. At Aberdeen employment with masons was bad, but showed an improvement.

Ireland.

At Dublin employment generally improved. At Belfast employment showed little change, but at Cork improved.

Current Rates of Wages in Large Centres.

Towns.	Masons.	Bricklayers.	Carpenters and Joiners.	Plasterers.	Slaters.	Plumbers.	Painters.	Labourers.
	d.	d.	d.	d.	d.	d.	d.	d.
Aberdeen	8	—	8	8	8	8	8	4½–5½
Accrington	9	9	8½	9	7½	8½	—	5–5½
Ashton-under-Lyne	9½	10	9	10	8½	9	8	5½–6½
Barnsley	9	9	8½	9	8½	8	8	6½
Barrow-in-Furness	9	9	8¾	9	9	8¼	8¼	6–6½
Bath	7½	7½	7½	7½	7½	6½ 7½	6½	5–5½
Belfast	8½	8½	8½	8¾	8	8½	8	19s.wk.
Birkenhead	9½–10	9½	9½	9½	9	9½	8½	5–6½
Birmingham	10–10¾	9½	9½	10	9	9½	8½	6½–7
Blackburn	9½	10	9	9	9	9	8	5½–6½
Blackpool	9¾	9½	8½	9½	8½	9	8½	5½–6
Bolton	9½	10	9½	10½	9	9	8½	6½–7
Bournemouth	8½	8	8	8	8	8	7½	5½
Bradford	9	9	8½	8½	9	9	8	6–6½
Brighton	9	8	8	8	8	9	7	5½
Bristol	9	9	9	9	9	9	8½	6–6½
Burnley	—	—	8½	—	—	—	—	—
Burton-on-Trent	8½	8½	8½	—	—	—	—	5¾–6
Bury	9½	10	9½	9	9	9	8½	5–6½
Cambridge	8½	8	8	8½	8	8½	6½	5–5½
Cardiff	9	9	9	9	9	9	8½	5½
Carlisle	8½	8½	8	8	9	8	8	5–5½
Chatham	9	9	8½	9	10	8½	7	5½
Cheltenham	8–8½	8	8	7¾	—	8	7½	5
Chester	9	9	8½	9	9	8½	7½	5–5¾
Coatbridge and Airdrie	9½	9½	9	9½	9	8½	9	6
Colchester	8	8	8	9	8	9	6 6½	5–5½
Cork	7⅔	7⅔	7⅔	7⅔	7⅔	8	8	3 5/9
Coventry	9¼	8¾	9	8¾	8¾	9	8	6
Crewe	8½	8	7	9	8	8	7	5
Darlington	9	9	8½	9	9½	8	7½	6
Darwen	9½	9½	9	9	9	9	8¼	6
Derby	9	9	8½	9	9	8½	7½	5½–6
Dublin	8–8½	8½	8–8½	8	8	8½	7½	4¼–4½
Dudley	8½	8	8	8½	8½	9	7	5½
Dundee	8–8½	10	9	8½	8½	8½	8½	5¼–5½
Eastbourne	8½	8	8	9	pce.	8	7½	5½
Edinburgh	8½	9½	9	—	—	9	—	—
Exeter	8	8	7½	7½	7½	7½	6½	5
Glasgow	—	9½	9½	9½	9	9	9	5½–6
Gloucester	7½	8	8	7½	7½	8	7½	5
Greenock	9½	10	9	9½	9½	9	9	5½
Grimsby	—	9	8	9	pce.	—	7½	6–7
Halifax	9	9	8¼	8½	8½	8½	7½	6
Hartlepools	9½–10	10	9¼	9½	—	—	—	7–7½
Hastings and St. Leonards.	8	8	8	8	—	8	7	5½–6
Huddersfield	9	9	11	8½	9	7½ 8	7½	6
Hull	9¼–9¾	9	9	9	9	9	8	6½–7
Ipswich	8	8	8	9	9	8	7½	5–5½
Keighley	8½	8½	8	7½	8½	7½	7½	6
Lancaster	9½	10	8½	9	9	8	8½	5½–6
Leeds	9½	9½	9½	9	8½	9	8	6½–7
Leicester	9	9	9	10	9	9	8	6–6½
Leigh	9½	9½	9½	9	8½	9	8	6–6½
Lincoln	8½	8	8	9	8	8	7½	5–6
Liverpool	9½–10	9½	9½	9½	9½	9½	8½	5–6
London	10½	10½	10½	11	—	11	—	—
Londonderry	7	7	7	7	6½	7	7½	15s.wk.
Macclesfield	8	8	8	7¾	6½	7½	7½	5
Manchester	9½–10	10	9½	10	9	9½	8¾	5½–7
Merthyr Tydfil	8½	8½	8	8½	8	8	7½	5½
Middlesbrough	9	9½	9¼	9½	9½	9	8	6¼–6¾
Newcastle	9½	9	9½	9½	9½	9	8½	6
Newport (Mon.)	8½	8½	7½	8½	8½	8½	7½ 8	5½
Northampton	8½	8½	8½	8½	—	8½	7½ 8	5½
North Shields	10	10	10	10½	9½	8¼	9	6½–7
Norwich	8	8	8	8	7½	8	6½	5
Nottingham	9½	9	9	10	9	9	8½	6½–7
Oldham	9½	10	9½	9	8½	9	8½	5½–7
Oxford	8½	8	8	8	8	8	7	5½
Paisley	9	9½	9	9	9	9½	9	6
Perth	8	10	8	8	8	8	7½	5½–6
Plymouth	8	8	8	8	8	8	7	5
Portsmouth	8½	8½	8	8½	pce.	7½	6½ 7	6
Preston	9½	10	9	8½	8½	8½	8½	5½–6
Rochdale	9½	10	9	9	8¼	9	8½	5½–6½
Rotherham	9½	9½	8½	8½	8	8½	7½	6
St. Helens	9	9	9	9	9	8½	8¼	5½–6
Scarborough	8½	8½	8	8¼	33s. wk.	8	7½	6
Sheffield	9½	9½	9	9	9	9	7½	5½–6½
Southampton	7½	8	8	8	pce.	8	7	5
Southport	9	9	8¾	9	9	9	8½	6
South Shields	9½	—	9½	—	9½	8½–1/16	9	6
Stockport	9½	9½	9	10	8½	8½	8	4¼–7
Stockton-on-Tees	9	9½	9¼	9½	9½	9	8	6¼–6½
Sunderland	9½	10	9¼	10	10	8½	9	6½–7
Swansea	8½	—	8½	8½	—	8½	7½	5½
Torquay	7	7	7½	7	7	7	7	4½ 5
Wakefield	9	8½	8	8½	8	7½	7½	6
Walsall	9	8½	8½	8½	8½	8½	7	5¾–6½
Warrington	8¾	9¼	9¼	9½	8½	9¼	8	5½ 6½
West Bromwich	9½–10	9	8½	9	pce.	8¼	7	6–6½
Wigan	9½	10	9	9	8½	9	8½	5½ 7
Wolverhampton	9	9	9	8½	8½	9	7½	6 6½
Worcester	8½	8½	8½	8½	8½	8½	7	5½
Yarmouth	7	7½	7½	A	7½	5½–7	6	4–4½

A. Done by bricklayer.

Current Market Prices.

FORAGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	11	0	1	13	0
Clover, best	per load	4	4	0	4	15	0
Hay, good	do.	3	15	0	4	0	0
Sainfoin mixture	do.	4	0	0	4	7	6
Straw	do.	1	8	0	1	14	0

MISCELLANEOUS.

		£	s.	d.	£	s.	d.
Bricks Stocks, d/d to job	per 1,000	1	15	0		—	
Do. Flettons on rail	do.	1	5	0		—	
Do. Pressed Wire Cuts, d/d to job	do.	1	17	0		—	
Do. Blue brindled wire cuts	do.	1	2	0		—	
Do. do. wire cuts	do.	1	6	0		—	
Do. do. pressed facings	do.	1	17	6		—	
Coke Breeze, into carts at gasworks	per load	0	2	0		—	
Do. d/d to job	do.	0	4	0		—	
Sand	per yard	0	7	6		—	
Ballast	do.	0	6	6		—	
Granite Chippings	do.	0	10	6		—	
Do. do. ¼in.	do.	0	11	6		—	
Granite Broken, 1½in.	do.	0	15	6		—	
Do. do. 2in.	do.	0	15	0		—	
Do. do. 2½in	do.	0	14	6		—	
Do. Kerb, Norwegian 6×12 and 12×6 in river	per foot	0	1	2		—	
Do. do. do. circular	do.	0	1	5		—	
Do. do. do. 12×8 in river	do.	0	1	5		—	
Do. do. do. circular	do.	0	1	8		—	
Do. do. Guernsey 6×12 in river	do.	0	1	4		—	
Do. do. do. circular	do.	0	1	6		—	
Do. do. do. 12×6 do.	do.	0	1	6		—	
Do. do. do. do.	do.	0	1	8		—	
Do. do. do. 18×8 do.	do.	0	1	8		—	
Do. do. do. do.	do.	0	1	10		—	
Do. Pitchings, Norwegian, 3×6	per ton	1	8	0		—	
Do. do. do. 3×7	do.	1	10	0		—	
Do. do. do. 3×5	do.	1	9	0		—	
Do. do. do. 4×5	do.	1	8	0		—	
Do. do do. 4×4	do.	1	13	0		—	
Do. do. do. 4×6	do.	1	5	0		—	
Do. do. do. 5×6	do.	1	4	0		—	
Do. do. do. 5×7	do.	1	4	0		—	
Do. do. do. Special, 4×6	do.	1	11	0		—	
Do. do. do. do. 5×7	do.	1	18	0		—	
Do. do. Guernsey, 3×6	do.	1	10	0		—	
Do. do. do. 3×7 & 3×9	do.	1	8	6		—	
Do. do. do. 3×5	do.	1	10	0		—	
Do. do. do. 4×5	do.	1	10	0		—	
Granite, Pitchings, Guernsey, 4×4	do.	1	13	0		—	
Do. do. do. 4×6	do.	1	9	0		—	
Do. do. do. 4×7	do.	1	6	6		—	
Do. do. do. 5×6	do.	1	6	0		—	
Do. do. do. 5×7	do.	1	5	0		—	
Do. do. Specials add.	do.	0	6	0		—	
Glass, English Sheet, in crates of stock sizes, 15oz., 2nds	per sq. ft.	0	0	3½		—	
Do. do. do. do. 3rds.	do.	0	0	2½		—	
Do. do. do. 21 oz. 2nds	do.	0	0	5		—	
Do. do. do. do. 3rds	do.	0	0	3½		—	
Do. do. do. 26 oz. 2nds	do.	0	0	6		—	
Do. do. do. do. 3rds	do.	0	0	4¼		—	
Do. do. do. 32 oz. 2nds	do.	0	0	8		—	
Do. do. do. do. 3rds	do.	0	0	6		—	
Do. English patent plain rolled plate in stock crates ⅛	do.	0	0	2		—	
Do. do. do. 3/16	do.	0	0	2¼		—	
Do. do. do. ¼	do.	0	0	2½		—	
Cement	per ton	1	12	0		—	
Lime	do.	1	4	0		—	
Castor Oil, French	per cwt.	1	10	0	1	2	0
Colza Oil, English	do.	1	6	0		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	15	0	2	17	0
Lead, white, ground, carbonate	per ton	16	0	0		—	
Do. red	do.	15	0	0	0	19	0
Linseed Oil, barrels	per cwt.	1	0	1½		—	
Petroleum, American	per gal.	0	0	6⅝	0	0	6¼
Do. Russian	do.	0	0	5¾		—	
Pitch	per barrel	0	9	0		—	
Shellac, orange	per cwt.	10	12	0		—	
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Town	per cwt.	1	7	6	1	8	0
Tar, Stockholm	per barrel	1	5	0		—	
Turpentine	per cwt.	2	3	4½		—	

METALS.

		£	s.	d.	£	s.	d.
Standard Copper	per ton	80	10	0	81	0	0
Do. Strong sheets	do.	94	0	0	95	0	0
Lead, soft foreign	do.	16	10	0	17	0	0
Do. English	do.	16	15	0	17	0	0
Do. pipes	do.	19	10	0	20	0	0
Do. sheets	do.	19	5	0	19	10	0
Galvanised Corrugated sheets	do.	12	10	0	12	15	0
Spelter G.M.	do.	26	15	0	27	0	0
Angles, Scotland	do.	7	0	0	7	2	6
Bars, do.	do.	7	17	6	8	0	0
Marked bars, Staffs.	do.	8	10	0	8	12	6
Common bars do.	do.	6	7	6	6	10	0
Angles, M'boro.	do.	6	10	0	6	15	0
Joists do.	do.	6	5	0	6	10	0
Angles, Midlands	do.	6	15	0	6	17	6
Joists, Midlands	do.	6	17	6	7	0	0
Girder plates, Midlands	do.	7	10	0	7	12	6
Angles, Foreign, c.i.f. Thames	do.	6	7	6	6	10	0
Tees do. do. do.	do.	6	10	0	6	12	6
Joists, Foreign, c.i.f. Thames	per ton	6	2	6	6	5	0
Channels do. do. do.	do.	6	7	6	6	10	0
Plates do. do. do.	do.	6	15	0	7	0	0
Tin, Foreign	do.	167	0	0	168	0	0
Do. English ingots	do.	167	0	0	168	0	0
Zinc, sheets, Silesian	do.	30	10	0	31	0	0

TIMBER.

SOFT WOODS.

		£	s.	d.	£	s.	d.
Fir, Dantzic and Memel	per load	2	15	0	4	15	0
Pine, Quebec, Yellow	do.	3	15	0	6	15	0
Do. Pitch, American	do.	3	12	0	5	0	0
Laths, log, Dantzic	per cu. fath.	4	0	0	6	0	0
Deals, Archangel Yellow, 3rd 3×11	per std.	11	0	0		—	
Do. do. do. 3rd, 3×9	do.	11	10	0		—	
Do. Atter (Abo.) do. & White, Inf. 5th, 3×8	do.	8	10	0		—	
Do. do. (do.) do. do. 3×9	do.	8	0	0		—	
Do. do. (do.) Yellow, unsorted, 3×9	do.	9	10	0		—	
Do. do. (do.) do. do. 2½×7	do.	9	15	0		—	
Do. Constantza, White, 3rd, 3×11	do.	9	10	0		—	
Do. do. do. 5th, 3×11	do.	6	0	0	6	10	0
Do. Gefle, Yellow, 4th, 4×11	do.	8	15	0		—	
Do. Gefle, Yellow 4th, 4×9	per std.	8	15	0		—	
Do. Kem do. 3rd 3×9	do.	11	10	0		—	
Do. Langror. do. 3rd, 3×8	do.	12	5	0		—	
Do. do. do. 4th, 3×8	do.	10	10	0		—	
Do. do. do. do. 3×7	do.	10	5	0		—	
Do. do. do. do. 2½×7	do.	10	5	0	10	10	0
Do. do. do. 5th 3×9	do.	10	5	0		—	
Do. do. do. do. 3×7	do.	9	15	0		—	
Do. Montreal, Red Pine, Dry 1st, 4×9	do.	15	5	0	15	15	0
Do. Quebec, Spruce 1st, 3×9	do.	14	10	0		—	
Do. do. do. do. 3×8	do.	11	10	0		—	
Do. do. do. 2nd, 3×7	do.	9	0	0		—	
Do. Soderham, Yellow, 4th, 4×9	do.	11	5	0		—	
Do. Stugsund do. 4th, 2½×7	do.	9	15	0		—	
Battens, Atter (Abo.), Yel- & White, Inf. 5th, 2×7	do.	9	0	0		—	
Do. do. (do.) do. do. do. do do. 2×5	do.	8	10	0		—	
Do. do. (do.) do. do. do. do. do. 2×4	do.	9	5	0		—	
Do. do. (do.) do. do. unsorted 2×3	do.	9	10	0		—	
Do. Gefle, Yellow, Inf. 5th, 2×9	do.	8	5	0		—	
Do. Larvik, do. unsorted, 2×2	do.	8	15	0		—	
Do. Montreal Pine, 1st, 2×11	do.	20	0	0		—	
Do. do. do. do. 2×9	do.	14	15	0		—	
Do. do. Red Pine, do. 2×8	do.	11	10	0		—	
Do. do. do. do. do. 2×7	do.	11	10	0		—	
Do. do. do. do. do. 2×6	do.	11	0	0		—	
Do. do. do. do. do. 2×5	do.	10	10	0		—	
Do. Mo. Dry White, 2nd, 2×9	do.	9	10	0		—	
Do. Soderham Yellow, 4th, 2×9	do.	11	5	0		—	
Flooring Boards, Fredriksstad, Yellow & White, 1×7	do.	0	8	6		—	
Do. do. do. do. 1×6½	do.	0	8	3		—	
Do. do. do. do. 1×6	do.	0	8	6		—	
Do. do. Mixed Yellow, 1×6	do.	0	10	0		—	
Do. do. do. do. 1×5½	do.	0	9	3		—	
Do. do. do. do. 1×5	do.	0	9	5		—	
Do. do. do. do. 1×4½	do.	0	8	6		—	
Do. do. Yellow, 3rd, 1×7	do.	0	9	9		—	
Do. do. do. unsorted 1×7	do.	0	10	6		—	
Do. do. do. do. 1×5½	do.	0	9	6		—	
Do. do. do. do. 1×5	do.	0	9	3		—	

HARD WOODS.

		£	s.	d.	£	s.	d.
Ash, Quebec	per load	4	2	6	7	5	0
Birch, New Brunswick	do.	2	0	0	5	0	0
Do. Quebec	do.	3	0	0	5	5	0
Box, Turkey	per ton	6	0	0	20	0	0
Cedar, Cuba	per ft. sup.	0	0	4½	0	0	5½
Do. Honduras	do.	0	0	4½	0	0	5½
Do. Tobasco	do.	0	0	5⅝		—	
Elm, Quebec	per load	4	2	6	8	10	0
Jarrah, plank	per ft. cu.	0	2	6	0	3	0
Mahogany, Average Price for Cargo, Honduras	per ft. sup.	0	0	5		—	
Do. Tobasco	do.	0	0	4	0	0	5½
Do. Cuba	do.	0	0	4	0	0	
Do. African	do.	0	0	3½		—	
Do. Lagos	do.	0	0	3¼	0	0	5
Oak, Wainscot	per log	2	10	0	6	5	0
Teak, Indian, logs	per load	8	10	0	19	0	0
Do. do. planks	do.	11	10	0	20	0	0
Whitewood, American, logs	per ft. cu.	0	1	3	0		6
Do. do. planks and boards	do.	0	1	3	0		

The Month's Trade

Reports by our Special Correspondents.

THE STONE, GRANITE AND MARBLE TRADES.

In these trades there is little improvement, if any, visible at present. Prospects are brighter, but it will be some time before the expected improvement comes. The Board of Trade reports for June are as follows:—

Employment in limestone quarries in Cumberland and South Durham was good, the same as a month ago and better than a year ago. In Weardale and in Derbyshire employment was fair. It was dull in Somerset blue lias quarries. In the Plymouth district employment continued quiet, a slight decline from a month ago being shown.

As regards other stone, employment was fair in the Newcastle and Gateshead district. In the Sheffield district employment was good in some branches, quiet in others. It was slack in all branches at Barnsley; at Normanton full time was worked. In the Bath stone quarries employment was moderate, and it was moderate also in sandstone quarries in the Forest of Dean; in the Gloucester red stone quarries it was good. Employment in the Clee Hill road material quarries continued moderate. In Forfarshire employment continued bad with much short time.

Employment in the granite quarries in Aberdeenshire on the whole was moderate. In Devonshire and Cornwall it continued bad generally. It continued fair in Leicestershire, and was fair also in North Wales.

In Aberdeenshire employment with sett makers was fair. Employment at Glasgow and Edinburgh was good and the same as a month ago. At Airdrie it was good and better than a month ago. It continued good at Stoney Stanton, and moderate in the Clee Hill district. At Rowley Regis employment was fair but not so good as a month ago.

The returns for imports of stones, slabs and marble, rough, hewn and manufactured, for the month of June, 1906, as compared with the same month in 1904 and 1905, are as follows:—

Tons.			Value.		
1904	1905	1906	1904	1905	1906
116,883	99,686	108,827	£126,712	£105,713	£111,460.

THE CLAY WORKING INDUSTRY.

We are happy to be able to record that the slight improvement which was noticeable last month in the brick and tile trades continues. Employment was moderate, but better than a month ago and a year ago, so we see that there is slow progression to a better state of affairs. The districts where things are better are analysed by the Board of Trade, which reports that employment on the whole was moderate, but was good at Oldham and in Norfolk and Cambridgeshire. It was fair in the Tees and Plymouth districts and in South Wales. In South Staffordshire it was bad. It is obvious from this that the cotton and engineering trades and agriculture are chiefly responsible for the improvement, but that the improvement has not yet become general and spread to the rest of the country.

THE PORTLAND CEMENT TRADE.

This month shows no change in the state of trade. The advance in price alluded to in previous reports has been well maintained, and orders have been plentiful, resulting in all the factories being well employed. The outstanding feature of the trade is the continued heavy demand for export, which is not confined to any particular market but applies to all our colonies and to a number of foreign countries who have been taking larger quantities of cement, not only from England, but the Continent recently, than for many years past. This is no doubt due to the increased popularity of concrete generally, as a building material, and more particularly to the rapid growth of the use of reinforced concrete in so many directions. This fact, coupled with the satisfactory state of the Home Trade, relieves manufacturers of any anxiety as to the disposal of their output for some time to come.

The new Building Act, which comes into operation on January 1st next, will result in a large increase in the demand for Portland cement as, at a rough computation, some 30,000 to 40,000 buildings in the London area will be scheduled for alteration so as to bring them within the new regulations. Reports from the Continent continue to show that manufacturers of Portland cement in nearly all districts are very busy, with, in some cases, their entire output pledged until right up to the end of the year. The statistical position is again in favour of this country, the exports for June showing a large increase, while the imports for the sixth month in succession show a substantial diminution. For the half-year to June 30 last, the imports decreased no less than 35,666 tons, while the exports increased by 84,367 tons. The former figures prove our contention that the Continental manufacturers are so busy in more profitable markets that they will not send their product to this country to compete with the low prices which, notwithstanding the recent improvement, still prevail.

The returns for imports and exports of cement for building and engineering purposes for June, 1906, as compared with the same month in 1904 and 1905 are as follows:—

	Imports.		
	1904.	1905.	1906.
Tons... ...	30,994	19,679	13,782
Value ...	£45,693	24,955	17,031
	Exports.		
	1904.	1905.	1906.
Tons... ...	26,818	40,851	61,551
Value ...	£42,437	64,474	88,036

The similar returns for the six months ending June 30th are:—

	Imports.		
	1904.	1905.	1906.
Tons... ...	139,654	125,093	89,427
Value ...	£203,485	161,979	113,135
	Exports.		
	1904.	1905.	1906.
Tons... ...	180,547	214,173	298,540
Value ...	£298,802	342,136	445,420

The world's production of Portland cement has increased from 2,500,000 tons to some 11,000,000 tons in the last twenty years, and the centre of the industry has shifted from Europe to the United States.

THE SLATE & TILE TRADES.

The Slate Trade.

There has been a slight improvement in the slate trade during the past month, probably accounted for by there being a greater demand for this material than in the early months of the year. The increase, however, is not sufficient to cause any improvement in prices, which still remain extremely unremunerative. Applications for prices have been brisk, but the areas of slating in prospective contracts continues to be small; very few large jobs are open, nor do we hear of many in the near future.

We understand that the Welsh quarries are finding improvements in demand; this demand, however, does not appear to be for material delivered, and it is expected that trade will be still brisker towards the autumn. Already odd sizes here and there have become scarce, which would tend to show that the stocks are being gradually diminished.

The demand for Precelly slates still continues to be brisk. From the Westmorland district we are unable to report any further increase in trade; the demand for these slates being principally for the north of England. It is hoped that in the re-building of the more important thoroughfares in London an opportunity will be found for using some of this material, as in the case of the Piccadilly Hotel, where Westmorland slating has been decided on.

The improvement seems to have spread to Delabole, where the quarries are fairly busy. There is also a slight tendency for prices to harden, and the slate from this district seems to be increasing in favour, as it is now freely specified by architects.

A slate which will commend itself to architects who, for purposes of economy, are unable to use Westmoreland, but desire to have a good stout slate, perfectly reliable for colour, and one that is practically impervious to London atmosphere, is "Viking Green." This slate (as its name would indicate) is produced in Norway, in the Valdres district. Norwegian slates hitherto, though of excellent quality, have left much to be desired in the method of manufacture. The proprietors of this particular quarry have, however, recently taken the best expert advice upon the method of production and sorting, and have recently attached to their staff an experienced Welsh sorter, who is perfectly acquainted with the requirements of various districts, with the result that the slate now produced is vastly superior to any regular sized green slate hitherto placed on the market. A standard has been adopted which will on the average show 50 slates to the foot, each slate therefore averaging nearly ¼in. in thickness. There are three shades of green—viz., best green, dark green, and grey. These slates should not be confounded with those produced in other neighbouring districts in Norway, nor do the proprietors seek financial assistance outside their own resources. The writer, having visited the locality, is able to substantiate these particulars, but at the same time he would caution the public against investing in any company prospecting for slate in the interior of Norway, without due enquiry as to the vicinity of a railway siding, as the success of such undertaking will entirely depend upon having near access to the railway.

Another excellent green slate is the "Unfading Green" from the Eureka quarries, which must not be confused with a slate very similar in appearance, but which after short exposure changes its colour. The "Eureka" slate, for which Messrs. Roberts, Adlard & Co., of Bermondsey, are sole agents, has been used in this country continuously for nearly 40 years, which would seem to prove it is a good, reliable slate, which is further borne out by the agents' statement that in no case has any complaint brought to their knowledge regarding these slates ever been substanstiated. A well-known London architect had occasion recently to make enquiries regarding the durability of "Eureka" slates, and was satisfied, after inspecting some roofs, that these slates were satisfactory. It is not surprising, therefore, that the demand for these slates, especially from architects' specifications, is a constantly increasing one.

Tile Trade.

The reports from the tile manufacturers are on the whole disappointing, the Broseley district especially being short of orders. Some works report that there is an increasing demand for inferior quality tiles. We cannot help feeling that this class of tile would be far better kept out of London, where the danger from tiles cracking across and slipping down is very much greater than in country districts. We understand that until comparatively recently tiles of an inferior quality were used solely in the agricultural districts and were practically kept out of London altogether. Adherence to this policy would remove any possible temptation to pass in a few truck loads of inferiors to help out a job which had been taken at a very low figure.

The tile trade generally in London seems to show an improvement, several large school jobs in the suburbs have recently been let, requiring over 120,000 tiles each, and there seems to be a distinct revival in the use of tiles in preference to slates in the London area. There is still an increasing demand for old roofing tiles, which invariably fetch high prices and are still very difficult to obtain, and only then in quantities of a few thousand at a time.

From the Sussex district the report seems encouraging; the kilns of one large works have been kept fully going, and the material has been disposed of without stacking. Some improvement in the manufacture of both bricks and tiles seems to have been made with very satisfactory results. It may not generally be known that some of the tileries in the Sussex district make nibbed tiles; these, however, should not be confounded with the handmade sand-faced, very few of which are obtainable with nibs. We think it would be well if manufacturers gave their attention to this, as many architects are averse to pinning tiles down; if they do so at all, only in the case of every fourth or fifth course. There is no doubt that a handmade sand-faced tile nibbed and holed, if of good colour and make, would sell freely. Many of the nibbed tiles produced in this district find a ready sale in the south of London, where the cheap railway rate is no doubt of great assistance to the makers.

The demand for hand-made sand-faced tiles is still extremely brisk, the increase in sales being about 50 per cent. above the corresponding period of last year.

THE PAINT TRADES.

The paint trades are fair. As regards materials, the returns for imports and exports for June, 1906, as compared with the same month in 1904 and 1905, are as follows:—

IMPORTS.

	Cwts. 1904.	Cwts. 1905.	Cwts. 1906.	Value. 1904.	Value. 1905.	Value. 1906.
White lead	23,993	19,713	16,181	£19,833	15,813	14,864
Zinc oxide	125,893	22,422	24,765	90,883	21,862	27,251
Other colours and pigments		113,388	140,503		72,899	79,973
Turpentine	60,663	86,997	52,767	115,912	210,991	105,729
Lac-dye, seedlac, shellac and sticklac	5,301	6,049	4,497	49,180	44,263	41,905
		Tons.				
Linseed oil	47	575	1,128	796	11,615	23,023

EXPORTS.

	Cwts. 1904.	Cwts. 1905.	Cwts. 1906.	Value. 1904.	Value. 1905.	Value. 1906.
White lead	28,131	29,241	29,311	26,238	27,387	31,517
Zinc oxide	111,317	6,714	4,970	144,149	7,755	6,028
Other colours and pigments		105,347	120,731		137,065	154,657
		Tons.				
Linseed oil	3,629	2,265	2,012	64,672	45,724	49,137

THE GLASS TRADE.

The glass trade continues fair. The Board of Trade reports that employment was good with sheet-glass makers and flatteners at St. Helens. It was fair with glass blowers in London and with flint-glass makers and plate-glass bevellers at Birmingham.

The returns for imports and exports of glass for the month of June, 1906, as compared with the same month in 1904 and 1905, are as follows:—

IMPORTS.

	Cwts. 1904.	Cwts. 1905.	Cwts. 1906.	Value. 1904.	Value. 1905.	Value. 1906.
Window and German Sheet, including shades and cylinders	86,429	77,571	100,594	£51,374	44,971	56,208
Plate	44,461	37,803	31,093	51,887	43,686	40,748

EXPORTS.

	Cwts. 1904.	Cwts. 1905.	Cwts. 1906.	Value. 1904.	Value. 1905.	Value. 1906.
Plate	4,322	8,537	10,879	6,260	11,142	16,907

THE TIMBER TRADE.

The Board of Trade reports that during June employment with millsawyers and woodcutting machinists was on the whole dull. Trade unions with a membership of 4,602 reported 199 (or 4·3 per cent.) as unemployed at the end of June, which is the same percentage as at the end of May, 1906, while the percentage for June, 1905, was 5·2. Employment was good at Birmingham, Aberdeen, Dundee, Bristol, and Darlington, and improving at Cork and Hull. It was fair at Leeds, but bad at Liverpool.

The Liverpool Market.

Business in builders' timber has been of the steady but uneventful kind, a very fair demand being experienced, chiefly from South Lancashire and from North and East Cheshire. A good deal of timber has been passed over the railways working from Liverpool within the last three weeks to the neighbourhoods of Warrington, St. Helens Junction, Garston, Wigan, Ormskirk, and smaller places in the vicinity of the towns named. Planks and flooring-boards especially have moved freely by rail, and the despatching of these has kept the yards agreeably active.

New interest has been given to the trade by the coming forward of the early consignments of

Canadian wood

for the season. Waney pine has come to hand freely, but good orders had been booked for this timber, so that supplies have been passed on to customers with as little delay as possible. Stocks are considerably in excess of those held a month ago. Apart from contracts, there is a fair demand, and prices are firm. Canadian pine deals have been received in larger though moderate quantities. The consumption has increased slightly. Stocks have also increased and are quite adequate to the demand, but are less than those held a year ago. Prices are practically unchanged. Pine deals from New Brunswick and Nova Scotia have arrived in large quantity, but much of the timber of this class has gone on to Manchester. Values continue steady.

Norway flooring boards

have been received in smaller quantities. Prices have been a shade easier.

Red deals and boards from the Baltic have arrived more freely. The consumption has been light.

Pitch-pine

has come to hand on a much more extensive scale. The consumption has increased, but not nearly to the extent of the increased importations. Stocks are more than double what they were a month ago, though they are little more in the aggregate than half of what they were a year ago.

Oak

of western growth has come to hand very plentifully. The consumption has been greater, but stocks close heavier in the aggregate. Baltic oak has arrived in limited supply, but the demand has been very small. Wood of high quality still brings full prices, but inferior wood is neglected.

Teak

also has arrived in larger quantities, but the demand has been small. Stocks have increased, but values are well maintained.

The Mahogany Market

continues in a strong position, there being a good demand for all wood of fair to high-class quality.

Dock Improvement.

A matter of considerable interest to timber importers at Liverpool was brought before the Mersey Docks and Harbour Board at their meeting on July 12th. This was a recommendation of the Works Committee that the Brocklebank and North Carriers' docks and quays be extended and improved, at an estimated cost of £279,500. The scheme contemplates as its main feature an enlarging of the Brocklebank dock at the north part and on the east side. On this, east side, there is at present a wide expanse of quay and yard space. A large part of this is to be converted into a dock, which will form part of the Brocklebank dock, on the east side of the present dock, and will have a width of 395ft. and a length on the north side of 1,160ft., and on the south side of 940ft., quays of these lengths being made on each side respectively. The eastern half of the south quay will be low, and will form a timber slip-way. The entrance to the existing Carriers' dock, a timber dock, will be widened to 110ft. The main effect of the proposed alterations will be to provide 2,000 feet of quay space in place of 400 feet which now exist, a considerable part of the new space being intended for the convenience of the timber trade.

THE IRON AND STEEL TRADES.

Recent Progress.

A month which embraces such incidents as a substantial reduction in the concerted price for bar iron, some export records, and a definite scheme of united action between the Scottish and North of England makers, can scarcely be said to be lacking in interest.

Omit Sheffield, and all England opened the month with very indifferent prospects as regards home buying.

In the Birmingham district the slackness in the early part of the month was more marked than elsewhere in practically all lines, but especially in common iron. Rumours were early afloat respecting the contemplated reduction in the price of marked iron bars, but makers kept their intentions very much to themselves.

The weakness in common iron was emphasised by reports that business had eventually been transacted at prices a shade under £6 5s., a figure which has not been descended to for some time past.

In structural steel shapes there was a conspicuous lack of enquiry, and only in galvanised sheets was there any degree of briskness. The figure of the Associated makers of £12 10s. was early exceeded. Most makers were able to get £12 12s. 6d., and in some cases even this figure was improved upon.

Sheffield has for some time past enjoyed a very high level of prosperity, and the month opened without any material change in prospects, and all the works appeared to have as much work as they could deal with for some weeks to come.

Middlesbro' shipments of iron, steel, and pig iron proved rather more encouraging for June than had been anticipated, some 127,500 tons having gone abroad and 46,000 coastwise. Manufactured lines, however, did not look particularly hopeful; quotations remained unchanged, and in many quarters the supply of orders appeared to be running short.

In Scotland an extraordinary atmosphere of languor pervaded the pig iron market during the first week of the month. At the same time there was nothing in the prospects of trade that should have given rise to anything of the nature of depression.

The following are a few representative figures:—Steel angles, £7; bars, £8; sheets, £8 5s. 6d.; ship plates, £7 5s.; best iron bars, £7 7s. 6d.; crown bars, £7 2s. 6d.; angles, £7 2s. 6d.; all per ton.

The Half-Year.

In the ebbing and flowing of the tide of a great industry six months is too short a period to produce anything approaching a metamorphose. Fluctuations take place from day to day in the smaller interests which go to make up the whole, but the British markets are so huge, diverse and so widely scattered, that the story of ultimate survival or decline will have to be spread over years instead of months.

Again, the Board of Trade returns are far from being an infallible index to the state of trade. One circumstance which supports this is, that the effects of large exports upon the home trade are not necessarily either consistent or decisive. Another is instanced by the shipbuilding exports. The huge increase of 3½ millions sterling in ships is to a great extent attributable to orders placed during the closing months of last year, and it was during that period that a large proportion of the work was done and the steel and iron contracted for.

However, it would be futile to deny that, on the whole, the January-June of 1906 may be placed among the most profitable and prosperous half-years of recent times.

We reproduce a few comparisons of the lines which possess particular interest:—

Iron and Steel Exports.

January—June.

	1905. £	1906. £
Pig iron - - - -	1,422,908	2,389,462
Wrought iron bars -	492,789	578,344
Iron and steel rails -	1,276,847	1,051,747
Black plates - - -	300,846	304,494
Tinned plates - -	2,407,341	2,322,544
Steel bars - - -	964,392	1,239,306
Cast-iron goods - -	225,548	250,223
Wrought-iron goods -	406,321	475,692
Plates - - - -	703,271	1,007,833
Steel girders, etc. - -	273,406	500,325
Steel goods—generally -	679,747	817,060
Ships - - - -	2,155,573	5,811,192
Implements and tools -	850,481	1,014,763

In the Scotch industrial area the past six months have been practically the most prosperous on record. Prices all round commenced at a pretty high level, and, with the exception of a few incidental fluctuations, have been well maintained throughout. The steel makers have been well employed, and the amount of material rolled is stated to have been over a million tons.

In the Midlands, in spite of the recent slackness, it is generally admitted that the half-year's business has on the whole been very satisfactory, and that the turnover has been in excess of what had been anticipated.

Steelmakers in the Sheffield district have had an exceptionally remunerative half-year. Prices generally have not been raised to inordinate levels, and as a consequence trade has been very steady and consistent throughout.

The Present Position.

The quarterly meeting of the Midland Iron Trade took place at Birmingham at the middle of the month. So far as volume of business is concerned it was altogether a somewhat depressing affair. At the same time signs are not lacking that matters will soon take an upward turn, more particularly in structural steel shapes. Galvanised sheets maintained their figure of £12 12s. 6d. and thereabouts, and makers have plenty of orders on their hands.

The most notable event to record is the decision of the marked bar-makers to reduce their basis price by 10s. per ton, making it now £8 10s. To manufacturers of other shapes this step is regarded with considerable dissatisfaction. It has not, however, come as a surprise, and taking everything into account, there is much to justify the reduction.

Common iron bars are still in a depressed state, and are to be bought at anything between £6 5s. and £6 7s. 6d.

The following are a few representative prices in Iron and Steel in various centres:—

Iron and Steel Prices (per ton).

		£	s.	d.
Iron, crown bars, Lancas.	- - -	7	5	0
,, hoops	,, - - -	7	17	6
,, sheets	,, - - -	7	18	6
Steel bars	,, - - -	7	5	0
,, sheets	,, - - -	8	7	6
Iron angles, Scotland	- - - -	7	2	6
Common iron bars, Scotland	- - - -	7	0	0
Crown Iron Bars	,, - - -	7	2	6
Steel angles	,, - - -	7	0	0
,, bars	,, - - -	8	0	0
Marked iron bars, Staffs.	- - -	8	10	0
Common iron bars	,, - - -	6	7	6
Steel angles	,, - - -	6	15	0
,, joists	,, - - -	7	0	0
Girder plates	,, - - -	7	12	6
Common iron bars, Middlesbro'	- -	7	5	0
Steel angles	,, - -	6	12	6
,, joists	,, - -	6	7	6

In Sheffield and its immediate environment the briskness in all departments is well maintained. Home and export orders are plentiful, and to such a degree of optimism has the locality been aroused that even the South African market is proclaimed to be showing "signs of improvement"!

Exports from Middlesbrough continue good, and in the home trade, although buying is still slack, there is no noticeable retrogression.

The Scotch holidays have opened out with due solemnity, and it will be a few days yet before business pulls round to normal conditions.

The negotiations between the Scotch and North of England makers have now resulted in a definite scheme of co-operation being drawn up. As is natural, the idea is not favourably regarded on all sides, and a protest has already been raised in the House of Commons on the subject.

Suffice to say, the object of the arrangement is to prevent Scotch makers from entering the North of England market, and to give the English makers the run of the Scotch market for plates, angles, &c., only on such terms as the Scotch makers may decide. Providing that prices are not forced up, and there is no reason to assume that they will be, the arrangement is not necessarily antagonistic to the interests indirectly concerned.

In Continental material there has been a slight and apparently temporary slackening in prices. Works all over, however, continue busy. Steel bars are now quoted in the region of £6 12s. c.i.f. Thames, and iron bars about £6 3s. 6d. For steel angles the figure hovers around £6 7s. 6d., and for tees about £6 12s.; joists remain pretty firm at £6 3s. 6d., and channels £6 8s. 6d. and upwards, all the prices named being for delivery ex steamer Thames or equal East Coast ports.

Deliveries of ordinary rolled shapes are still somewhat slow, and altogether the position of the Continental market is not one of absorbing interest to buyers on this side.

OTHER METALS.

Conflicting reports from the United States, consistent only in their unreliability, have created some unsettlement in copper of late, but the fluctuations have not covered a very wide range. There have been rumours of firm reduced prices, but these have not gained much credence on this side. The figures during the past few weeks for Standard copper (cash) have been in the region of £81 in London, subject to the usual additions for small lots and freights. The past few days' movements have brought no material change about.

The general feeling in tin latterly has been somewhat on the slump side. Consumption in England has been low and the Welsh plating trade prospects are not encouraging. Present prices for Straits (cash) are £167 and thereabouts, which is about £10 below the highest figure for the month. This figure must not, however, be regarded as by any means a firm one, even for tin, as expert opinions are widely divergent as to the future.

Lead demand is also slack, and arrivals continue to be small. On the whole prices have kept within a fairly limited range, recent quotations being as follow: Soft foreign, £16 15s.; English, £16 17s. 6d.; pipes, £19 10s.; sheets, £19 5s.

Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, *Great New Street, Fetter Lane, E.C*

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Beckenham.—For the execution of alterations to Crescent Road Congregational Church. Messrs. George Baines & Son, architects, 5, Clement's Inn, Strand, W.C. :—

		*H. Copeland & Son.			E. R. Palmer.		
Estimate	"A"	£73	10	0	£79	10	0
,,	"B"	43	5	0	48	10	0
,,	"C"	25	5	0	34	0	0
,,	"D"	11	5	0	20	0	0
,,	"E"	4	10	0	4	14	0

* Accepted, with modifications.

Birmingham.—For the pulling down of old premises in Edgbaston Street, and the erection of new premises, for Messrs. Plant. Mr. Francis B. Andrews, A.R.I.B.A., architect, 95, Colmore Row, Birmingham. Quantities by Mr. J. K. Dale, Temple Row, Birmingham:—

	Main Bill.	Alternative.	
Moffat & Sons	£3,997	£150	£290
W. Bishop	3,997	140	205
W. Robinson	3,995	36	208
C. Bryant	3,977	145	190
T. Mills & Sons	3,947	166	230
T. Elvins	3,938	150	140
T. Loud & Sons	3,850	115	240
J. Barnsley & Sons*	3,675	86	248

* Accepted.

Bishop's Stortford.—Alterations and additions to 2, Market Square, Bishop's Stortford, for Messrs. Walker & Co.. per Mr. Francis P. Trepess, architect, Warwick. Quantities by architect :—

Saunders & Sons	£1,215	0	0
Glasscock & Son	1,050	0	0
C. Martin	1,049	3	1
J. Day	998	8	6
C. A. Faulks	950	0	0
F. Newberry*	930	0	0

Architect's estimate, £1,000

* Accepted.

Caerphilly.—For the erection of an isolation hospital. Mr. J. H. Phillips, F.R.I.B.A., architect, Cardiff :—

R. Jones, Abertridwr	£12,587
J. Allan & Sons, Cardiff	12,129
G. Hallett, Cardiff	12,000
A. Colbourn, Swindon	11,998
J. Williams, Abetridwr	11,973
Knox & Wells, Cardiff	11,950
W. Thomas & Co., Cardiff	11,903
S. Jones, Pontypridd	11,787
D. Davies, Cardiff	11,490
F. Stanbury, Devonport	11,477
Blacker Bros., Cardiff	11,400
Price Bros., Cardiff	11,290
J. Jenkins, Newport	11,230
D. C. Price, Penarth	11,050
W. Bowers & Co., Hereford	10,990
E. R. Evans & Bros., Cardiff	10,797
T. F. Howells, Cardiff	10,700
Hamilton & Millard	10,650
J. E. Evans, Cardiff	10,589
T. Bevan, Penarth	10,239
G. Rutter, Barry	10,200
W. T. Morgan, Cardiff	10,145
A. J. Rossiter	10,040
R. W. Hunter & Co., Cardiff	9,935
J. Lewis*	9,880
M. Harding	9,860

Rest of Caerphilly.

*Accepted.

Chard.—For hydraulic ram, reservoir, and laying on water to Whitestaunton Manor House, schools and vicarage, for Commander Elton, R.N. Messrs. Symes and Madge, architects and surveyors, Somerset House, Chard. Quantities by architects :—

Jenkins & Sons, Leamington	£256	17	6
A. & T. Tutcher, Bristol	252	0	0
Chas. J. Ell, Luton	215	17	9
Dening & Co., Chard	210	0	0
A. Hutchings, Ilminster	198	0	0
H. J. Spiller & Sons, Taunton	182	10	0
O. G. F. Dunn, Crewkerne	180	1	0
Phœnix Engineering Co., Ltd., Chard	174	15	0
J. H. Smith, Chard	174	15	3
Parsons Bros. & Dunster, Chard	170	0	0
Wm. Stone,* Combe-St.-Nicholas, near Chard	165	0	0

Architects' estimate, £170.

* Accepted.

Chard.—For the erection of extension buildings at Holyrood Lace Mills, for Messrs. Gifford, Fox & Co. Messrs. Symes & Madge, architects and surveyors, Somerset House, Chard. Quantities by architects :—

	Contract No. 1.			Contract No. 2.		
Gleed Bros., Bridgwater	—			£2,426	19	3
Ellis & Sons, Cullompton	—			2,394	16	0
Ham Hill and Doulting Stone Co., Norton	—			2,297	15	0
J. Cassé, Hampton Wick	£275	0	0	2,260	0	0
T. Munford, Crewkerne	188	0	0	2,171	16	10
Alex. Poole, Ilminster	206	0	0	2,098	0	0
Harris & Woolcott, Chard	171	17	6	2,070	10	6
Parsons Bro. & Dunster, Chard	206	10	0	1,970	0	0
H. J. Spiller & Sons,* Taunton	190	0	0	1,938	0	0
(Architects' estimate	225	7	6	2,102	5	6)

*Accepted.

Epsom.—For the erection of new engine-house, &c., for the Urban District Council. Mr. W. Vaux Graham, M.I.C.E., engineer, 5, Queen Anne's Gate, Westminster :—

W. Smith & Sons, Croydon	£2,358	0	0
J. Mowlem & Co., London, S.W.	2,310	0	0
D. Lee, Upper Norwood, S.E.	2,244	0	0
W. H. Brown, Leatherhead	2,190	0	0
A. N. Coles, Plymouth	2,185	14	0
Martin, Wells & Co., Aldershot	2,167	17	0
Cropley Bros., Epsom	2,165	10	0
Potter Bros., Horsham	2,141	1	10
Cummins & Sons, Betchworth, Surrey	2,141	0	8
Wisdom Bros., Isleworth	2,125	0	0
Page & Son, Croydon	2,056	5	10
Roll & Taylor,* Epsom	1,855	5	6

*Accepted.

Four Oaks.—For the erection of a house in Bracebridge Road, for the Misses W. L. and H. L. Child. Mr. Francis B. Andrews, A.R.I.B,A., architect, 95, Colmore Row, Birmingham. Mr. J. K. Dale, quantity surveyor, Temple Row, Birmingham :—

Moorehouse	£1,280
Bird	1,240
Barnsley & Sons	1,238
Langley	1,224
A. Pearce	1,214
Turville & Sons	1,197
Smith & Sons	1,189
Elvins*	1,140

* Accepted.

Four Oaks.—For the erection of a house in Wentworth Road, for W. A. Perry, Esq. Mr. Francis B. Andrews, A.R.I.B.A., architect, 95, Colmore Row, Birmingham. Mr. J. K. Dale, quantity surveyor :—

	Main Bill.	Alternative.	
Moorehouse	£1,080	£35	£58
Bird	1,075	46	48
Barnsley & Sons	1,066	42	45
Langley	1,050	31	51
Turville & Sons	1,049	42	46
A. Pearce	1,037	18	42
Smith & Sons	990	33	45
Elvins*	973	50	43

* Accepted.

Gorseinon.—For the erection of a new co-operative stores in High Street. Mr. William Williams, architect, Frondeg, Pontardulais :—

Jenkins, Gorseinon	£1,246	10	0
Clerk & Jones, Pontardulais	1,166	0	0
Fry & Thomas, Penclawdd	1,087	10	0
Rees Thomas & Son, Loughor	1,079	0	0
A. & A. Thomas,* Swansea Road, Pontardulais	1,006	0	0

* Accepted.

Haslemere.—For the erection of a house at Marley, Haslemere. Mr. John H. Howard, architect and surveyor, Lower Street, Haslemere :—

Frank Milton, Witley	£1,392	0	0
R. Smith	1,350	0	0
Chapman & Lowry	1,300	0	0
David Fry, Godalming	1,198	0	0
Haslemere Builders, Ltd.	1,185	0	0

[Rest of Haslemere.]

* Accepted.

Letchworth (Herts).—For making new roads for the First Garden City, Limited :—

W. Griffiths & Co., Bishopsgate Street, E.C.	£4,931	10	0
S. Kavanagh & Co., Surbiton Hill	4,546	14	6
Fry Bros., Greenwich	4,480	3	11
E. Rogers & Co., North Kensington	4,384	0	0
C. W. Killingback & Co., Camden Town	4,310	17	1
G. Holloway, Wolverhampton	4,265	5	7
W. Jones & Son, Neath	4,190	11	7
Wallace & Innes, Stevenage	4,112	8	1
J. Jackson, Plaistow	3,931	0	0
R. C. Brebner & Co., Edinburgh	3,856	13	8
T. Adams, Wood Green	3,816	6	0
W. H. Worthington, Manchester	3,769	7	0
E. & C. Iles, Wimbledon	3,637	0	0
T. Free & Sons, Maidenhead	3,549	10	0
W. Johnson, Sheerness	3,415	10	7
J. C. Trueman, Swanley	3,399	0	0
F. G. Porter, Leyton (corrected tender)	3,350	8	2
Davis, Ball, & Co.,* Letchworth (corrected tender)	3,304	19	4
Hardy, Bate, & Co., Slough (corrected tender)	2,702	18	11

* Accepted.

London, E.—For the erection of school for mentally defective children at Janet Street, Poplar, for the London County Council :—

	Original Specification.			Amended Specification.		
Griggs and Son, Cubitt Town	£4,172	13	3	£4,102	0	3
G. Parker, Peckham	4,123	4	2	3,831	16	4
Staines & Son, 61, Gt. Eastern Street	4,040	0	0	3,775	10	0
R. Elvy & Son, Southend	3,943	0	0	3,679	4	0
W. J. Clemens, Stratford	3,714	4	8	3,613	5	10
F. & T. Thorne, Isle of Dogs	3,640	0	0	3,447	6	6
J. & M. Patrick, Wandsworth	3,529	0	0	3,307	0	0
W. H. Hyde, Norwood Junction	3,416	0	0	3,202	14	0
Martin, Wells & Co., Ltd., Vauxhall	3,408	0	0	3,266	11	9
*J. & C. Bowyer, Westow Street, Upper Norwood	3,299	0	0	3,118	10	11

Architect's (Education) estimate, original specification —£3,302.

*Recommended for acceptance.

London, N.E.—For the erection of colour works (Building No. 3) at Homerton, for Messrs. Lewis Berger & Sons. Mr. H. Tanner, jun., A.R.I.B.A., architect, 12, Regent Street, S.W. Quantities by Messrs. W. H. & P. B. Strudwick :—

Waring White Building Co.	£6,731
Colls & Son	6,468
Holland & Hannen	6,451
Carmichael	6,425
Chessum & Co.*	6,145

* Accepted.

London, N.E.—For the erection of colour works (Building No. 25) at Homerton, for Messrs. Lewis Berger & Sons. Mr. H. Tanner, jun., A.R.I.B.A., architect, 12, Regent Street, S.W. Quantities by Messrs. W. H. & P. B. Strudwick :—

Foster & Dicksee	£7,705
Mowlem & Co.	7,700
Colls & Son	7,496
Chessum & Co.	7,474

London, S.E.—For the rebuilding of party wall at Grange Yard, Bermondsey. Messrs. Ed. Crosse & Co. and Messrs. Elkington & Son, architects :—

Howell J. Williams	£425
Wells Brothers	395
J. Smith & Sons	364
Thomas & Edge	357
Joslyn & Young	356
Harbrow	326
G. Parker	307

London, W.C.—For the erection of the Holborn Tramways Sub-station, on the bills of quantities prepared for the Mildmay Park Tramways Sub-station, for the London County Council :—

G. Munday & Son, London	£6,855
H. Lovatt, Ltd., London & Wolverhampton	6,713
C. Wall, Ltd., Grays*	6,440

* Recommended for acceptance.

Otford (Kent).—For the erection of an isolation hospital for the Sevenoaks Rural District Council :—

W. Lawrence & Son	£6,647	0	0
W. J. Maddison, Canning Town	6,490	0	0
H. E. Phillips, Gillingham	6,480	0	0
H. Constable, Penshurst	6,473	10	0
R. Durtnell & Sons, Brasted	6,320	0	0
J. E. Somerford & Son	6,152	0	0
W. P. Banks, Dunton Green	6,139	0	0
Jones & Andrews, Beckenham	6,078	0	0
I. Chesman & Sons, Bow	6,031	0	0
A. N. Abbott	5,986	12	11
Patman & Fotheringham	5,976	0	0
Spencer, Santo, & Co., Kensington	5,975	0	0
West Bros., Maidstone	5,957	0	0
E. Wallis, Sevenoaks	5,906	0	0
J. Barker & Co., Kensington	5,873	0	0
Thomas & Edge, Woolwich	5,850	0	0
J. Lonsdale, Swanley Junction	5,743	0	0
Strange & Sons	5,735	0	0
Martin & Co., Tonbridge	5,694	0	0
W. H. Hyde, Norwood Junction	5,690	10	0
G. Browning, Canterbury	5,636	0	0
W. F. Blay, Dartford	5,539	15	0
G. E. Wallis & Sons,* Maidstone	5,534	0	0
J. A. Davison, West Malling (withdrawn)	5,095	0	0

* Accepted.

Ryde (I.W.).—For additions to the Royal Isle of Wight County Hospital, including the erection of a new wing. Mr. F. W. Cutler, F.R.I.B.A., architect, Bloomsbury, London, W.C. :—

E. James, Binstead	£5,847
T. & E. W. Jenkins	5,665
C. Langdon, Ryde	5,458
J. I. Barton	5,228
J. Croad, Portsmouth	5,190
J. Ball & Son	5,180
H. Cawte, Southampton	4,835

Southampton.—For the reconstruction of "The Steward's Arms" in Marsh Lane. Mr. A A. Burnett. F.S.I., architect, 2, High Street, Southampton :—

Ex'ors. of the late W. Franklin	£2,070
H. Stevens & Co.	1,968
Golding & Ansell	1,940
A. Doggrell & Son	1,850
A. Wright & Son	1,798
Jenkins & Sons, Ltd.	1,785
Dyer & Sons	1,778
H. Cawte*	1,750

[All of Southampton.]

* Accepted subject to agreed variations.

Wandsworth.—For the erection of iron buildings at Enshaw Street and Franciscan Road, and the removal of other iron buildings, for the London County Council.

J. McManus, 237, Hammersmith Road	£1,860
A. Leather, Wandsworth	1,584
W. Bain & Co., Coatbridge, N.B.	1,550
W. Harbrow, Bermondsey	1,479
T. J. Hawkins & Co.,* 109 Victoria Street, Westminster	1,447

* Recommended for acceptance.

A Parish Hall at High Felling which forms part of a scheme for church extension, is now being built. The architects are Messrs. Hicks and Charlwood, of 67, Westgate Road, Newcastle, and the contractor is Mr. W. Hall, of Bensham. The building will be of pressed brick, with stone facings.

Builders' Current Price List of Specialities

This list is not intended to promote undercutting, and prices are subject to discounts for a quantity and for cash. Readers are advised to write for these discounts. Where prices for goods are standardised and fluctuation takes place in trade discounts, our prices have the discounts deducted. In some cases it is difficult for firms to quote prices, and we have stated where they will be pleased to send catalogues and quotations immediately on receipt of applications.

Goods.	Description.	Merchants or Manufacturers.	Address.	Size.	Weight.	Quantity. per	Price		
							On Rail.	Dlvrd. at London Termini.	Dlvrd. to Buyer
Baths:									
Iron	Rolled edge, white vitreous enamelled	Doulton and Co., Ltd.	Lambeth, London	5ft. 6in. inside	—	each	£4 7s. 6d.	—	—
Bathroom Suites	Complete as advertised	Standard Sanitary Manufacturing Co.	22, Holborn Viaduct, London	—	—	—	—	—	£18 18s.
Blinds:									
"Japa"	Sanitary	Japa Blinds, Ltd.	55, Barbican, London, E.C.	All sizes	72 long 36 wide	—	—	2s. 6d. to 16s. doz.	Free.
Boilers:									
Saville	Wrought-iron for hot-water heating and supply	Hartley & Sugden, Ltd.	Halifax	30×13 to 72×30	3 cwt. to 17 cwt.	each	£9 5s. to £52	Free in Great Britain.	
Bricks:									
Blue	Staffordshire pressed	Hathern Station Brick and Terra Cotta Co., Ltd.	Loughborough	9×4½×2⅝	3·5 tons	1000	£2 15s.	£3 13s.	—
Facing	Blue and brindled	G. Woolliscroft & Sons, Ltd.	Hanley, Staffs.	9×4½×3	3·75 tons	1000	35s. to 37s. 6d.	£4 3s. to £3 5s. 6d.	—
Facing	Red terra-cotta	G. Woolliscroft & Sons, Ltd.	Hanley, Staffs.	9×4½×3	3·75 tons	1000	£2 10s.	£3 18s.	—
Stocks	Sand stocks	Gibbs Brothers	Loughborough	9×4½×2⅝	2·12 tons	1000	£2	£2 15s.	—
Casements and Sashes:									
Metal Casements	Iron, steel, and bronze	George Wragge, Ltd.	London and Manchester	Registered sections	—	each	From 15s.	16s.	—
Metal Sashes	Ditto	Ditto	Ditto	Ditto	—	ft. super.	From 6d.	—	—
Castings:									
Iron	Plain and Ornamental	Walter Macfarlane & Co.	Saracen Foundry, Glasgow	—	—	—	Prices on application.		
Cement, Lime, &c.:									
Cement	Portland	Associated Portland Cement Mnfrs. (1900), Ltd.	Dixon House, 72, Fenchurch Street, E.C.	—	—	—	Prices on application.		
Lime	——	Associated Portland Cement Mnfrs. (1900), Ltd.	Dixon House, 72, Fenchurch Street, E.C.	—	—	—	Prices on application.		
Chimney-Pieces:									
Marble	——	J. & H. Patteson	7, Bayley Street, Bedford Sq., London. and Oxford Street, Manchester	—	—	—	Prices on application.		
Chimney Pots	"Notlor" patent self-flanching and weathering	Notley & Taylor	Finsbury Pavement House, E.C.	9×9 and 14×9 flues	—	—	—	From 3s. 6d.	—
Closets:									
Cisterns, Seats, &c.	For houses	Adamsez, Ltd.	Scotswood-on-Tyne	—	—	set with fittings.	£2 to £10	—	—
Latrines	For schools and workmen	Adamsez, Ltd.	Scotswood-on-Tone	—	—	stall	30s. to 70s.	—	—
"Simplicitas"	——	Doulton & Co., Ltd.	Lambeth, London	—	—	each	£1 15s.	—	—
Columns	Cast-iron	Measures Bros., Ltd.	53B, Southwark Street, London, S.E.	stock patterns	—	ton	£7	£7	—
Compoboard	Swedish	Messers, Ltd.	79½, Gracechurch Street, E.C.	4ft.×8 to 18ft.×⅜in. and ¼in.	1 ton	2,000ft. super.	Prices on application.		
Concrete:									
Armoured	Floors and roofs	Trussed Concrete Steel Co.	Caxton House, Westminster	—	—	sq. yard	—	—	8s.*
Conduits:									
"Simplex" steel	Screwed wireduct	Simplex Steel Conduit Co., Ltd.	Garrison Lane, Birmingham	½ to 2 diam.	20lbs. to 140lbs.	100ft.	—	—	12s. 8d. to £3 3s.
Door Furniture:									
Door Springs	With silent check	Robert Adams (patentee)	3 & 5 Emerald Street, London, W.C.	For medium doors	—	each	D.A. 46s. S.A. 42s.	D.A. 46s. S.A. 42s.	—
Sliding Door Fittings	Top and bottom rollers and guide rails	John Bousfield	Bar Ironworks, York	various	—	each	—	rollers from 6s. 6d.	—
Drain:									
Testing Apparatus	For smoke or air test: No. 358	Burn Brothers	Rotunda Works, 3, Blackfriars Rd., London, S.E.	—	About 30lbs.	each	£4 4s.	—	—
Elevators:									
"Otis"	Electric and hydraulic	Otis Elevator Co. Ltd.	4, Queen Victoria Street, London	—	—	—	Prices on application.		
Enamels:									
"Sanaline"	Pure white or colours	Aspinal's Enamel, Ltd.	New Cross, London	—	—	gallon	—	—	18s.
Faience:									
White and coloured	For elevations	Alfred Whitehead	Prudential Build'gs, Leeds	—	—	sq. yard	74s. 6d.	79s.	—
Fans:									
Fans, Blowers, and Motors	Belt, electric or steam driven	Matthews & Yates, Ltd.	Cyclone Works, Swinton, Manchester	All sizes	—	—	Prices on application.		
Felt:									
Ruberoid Sacking Felt	High-grade inodorous felt	Robert W. Blackwell & Co., Ltd.	59, City Road, London, E.C.	36×72	44lbs.	roll, 24sq. yds.	—	—	13s. 6d.
Fencing:									
Iron	"Greenhill" patent automatic railing	Hill & Smith	Brierley Hill Iron Works, Staffs.	3½ft. high ⅝ verticals	40lbs. yard	yard	4s. 5d.	4s. 9d.	—
Fireproofing (See also Partitions):									
Terrawode Brick-wood	Fireproof floors	Jabez Thompson & Sons	Northwich, Cheshire	4ins. thick	—	sq. yard	6s.	7s.	—
Columbian	Reinforced concrete floors and roofs	Columbian Fireproofing Co.	37, King William Street, London	—	—	—	Prices on application.		
Steel Sheeting	For partitions, reinforced concrete, damp course, &c.	The Fireproof Co., Ltd.	10, York Build'gs, Adelphi, W.C.	All sizes	All weights	sq. yard	from 1s. 3d.	from 1s. 3d.	plus rail
Expanded Steel	Reinforcement for every description of concrete work	New Expanded Metal Co.	York Mansion, York, St., Westminster, S.W.	Up to 16ft. × 8ft.	2lbs to 30 lbs.	sq. yard	5d. to 4s. 9d.	Price list on application.	
Floors and Roofs	Steel concrete	Homan & Rodgers	17, Gracechurch Street	—	—	sq. yard	—	—	7s.*
Floors and Roofs	Reinforced concrete	Trussed Concrete Steel Co.	Caxton House, Westminster	—	—	sq. yard	—	—	8s.*
Floors and Roofs	Reinforced concrete	Potter & Co., Ltd.	66, Victoria St., London, S.W.	—	—	sq. yard	—	—	From 6s.*
Floors:									
Columbian	Concrete fireproof floors and roofs	Columbian Fireproofing Co.	37, King William Street, London	—	—	—	Prices on application.		
Euboeolith	Patent flooring	Euboeolith Patent Flooring	3, Victoria St., Westminster	—	—	yd. super.	5s. to 6s.	—	—

* Erected.

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Builders' Current Price-List of Specialities—*(continued).*

Goods.	Description.	Merchants or Manufacturers.	Address.	Size.	Weight.	Quantity. per	Price. On Rail.	Dlvrd. at London Termini.	Dlvrd. to Buyer.
Galvanised Iron:									
Sheets	Corrugated	Baldwins, Ltd.	5, Fenchurch St., London, E.C.	5ft. to 9 ft. × 2ft. × 22 or 24 G.	—	ton	—	£14 10s.	—
Sheets	Flat	Baldwins, Ltd.	5, Fenchurch St., London, E.C.	72 × 24 to 36 × 20 or 24 G.	—	ton	—	£15	—
Buildings	Of every description	Baldwins, Ltd.	5, Fenchurch St., London, E.C.	—	—	—	Prices	on applica	tion.
Gas Generators:									
Acetylene	Five-light portable	Strode & Co.	48, Osnaburgh Street, London.	15ins. diameter, 24ins. high.	—	each	—	£3	—
Glass:									
Stained & Embossed	Leaded lights, embossed and brilliant cut-glass	Young & Martin, Ltd.	Stratford, E.	—	—	—	Prices	on applica	tion.
Stained	Memorial & other windows	E. E. Oldacre & Co.	Stirling Place, Hove	—	—	ft. super.	Prices	on applica	tion.
Guards, Wire:									
Straight Lattice	Half mesh	Richard Johnson, Clapham, & Morris, Ltd.	Manchester	6ft. × 3ft.	14lbs.	sq. ft.	5d.	5½d.	5¾d.
Hooks:									
Hat and Coat	"Schola" pattern for schools, &c.	Brookes & Co., Ltd.	4, Cateaton Street, Manchester.	—	—	—	Prices	on applica	tion.
Joinery:									
Panelling	High-class 1-in. Austrian oak panelling.	Elliott's Moulding & Joinery Co., Ltd.	Newbury	3ft. to 7ft. high.	ft. super.	2s.	2s. 1d.	—	—
Joists:									
Steel	Broad flange beams	H. J. Skelton & Co.	71, Finsbury Pavement, London, E.C.	—	—	ton	—	£6 18s.	—
Steel	English and foreign	Columbian Fireproofing Co.	37, King William Street, London.	—	—	—	Prices	on applica	tion.
Steel	Belgian and German	Measures Bros., Ltd.	53B, Southwark Street, London, S.E.	3 to 20 deep	—	ton	£6 10s. basis sections.	£6 10s. basis sections.	—
Laundry Machinery:									
Finishing Machines	For Shirts, Collars, & Cuffs	W. Summerscales & Sons, Ltd.	Keighley, Yorks	12ins. to 42ins.	—	each	£30 to £50	£30 10s. to £51 10s.	—
Lavatories:									
Glazed Ware	For schools, workmen, and private houses.	Adamsez, Ltd.	Scotswood-on-Tyne	—	—	set, with fittings	£1 10s. to £4	—	—
Leaded Lights	All descriptions	E. E. Oldacre & Co.	Stirling Place, Hove	—	—	ft. super.	Prices	on applica	tion.
Lifts:									
Electric	All other types	A. Smith & Stevens	Battersea, London	All sizes.	All weights.	—	Prices	on applica	tion.
Hand-power	All kinds, for all purposes	George Johnson	227, St. John's Hill, London, S.W.	—	—	—	Prices	on applica	tion.
"The Premier"	Dinner and service lift to raise ¾ cwt.	The Lift & Hoist Co.	Premier Iron Works, Prince Street, Deptford, S.E.	Cage *inside* 2ft. wide, 1ft. 6 deep. 2ft. 6 high.	—	—	—	£9 10s.	—
Lighting and Heating:	Electric light and gas-fittings, &c.	Young & Marten, Ltd.	Stratford, E.	—	—	—	Prices	on applica	tion.
Lightning Conductors	Copper tape	Joseph Lewis	5 & 6, Great Winchester Street, London, E.C.	¾ × ⅛ and upwards.	—	foot run	from 1s.	—	—
Locks:									
Coin Collecting	Bright brass or bronzed	New Century Co.	235, High Holborn, London, W.C.	14ins. × 4½ins. × 1¼ins.	—	each	—	—	35s.
Kaye's Patent	Four lever mortice, iron and brass.	Joseph Kaye & Sons, Ltd.	93, High Holborn, London, W.C.	—	—	each	—	—	7s. 6d.
"C. and B."	Registered mortice Nos. 1, 2, and 3.	Colledge & Bridgen	Midland Works, Wolverhampton.	6 inch.	—	dozen	—	—	10s. 6d. £3 6s. £2 5s. £1 9s.
Mantelpieces:									
White Wood	With overmantel	The Hardware Trading Co.	12, New Oxford Street, London, W.C.	Opening 38 × 38	72ins.	each	£2	—	—
Marble, Mosaic, and Stone Work:									
Glass Mosaic	Coloured art	The Cloisonné Glass Co.	40, Berners Street, W.	—	—	sq. ft.	—	From 3s. upwards.	—
	Plain or design	J. & H. Patteson	7, Bayley Street, Bedford Square, London, and Oxford Street, Manchester.	—	—	—	Prices	on applica	tion.
Motor Wagons	Steam	St. Pancras Ironworks Co. Ltd.	171, St. Pancras Road, London, N.W.	—	4 tons 19 cwt.	each	—	From £530.	—
Paint:									
"Japonika," Enamel	Elastic, impervious, covers 90yds. sup. per gal.	John Line & Sons, Ltd.	Alfred Pl., Tottenham Court Rd., London, W.C.	—	—	gallon	18s.	—	—
Anti-corrosive, &c.	"Bitumastic" solution and enamel	Wailes, Dove & Co., Ltd.	Newcastle-on-Tyne, London, Liverpool, Cardiff, Birmingham, and Glasgow	—	—	—	Prices	on applica	tion.
Partitions:									
Dovetail Corrugated Steel Sheeting	For partitions, reinforced concrete, &c.	The Fireproof Co., Ltd.	10, York Buildings, Adelphi, W.C.	All sizes	All weights	sq. yard	From 1s. 3d.	From 1s. 3d.	1s. 3d. plus rail
Partitions	"Kulm" slabs	H. W. Cullum & Co.	Craven House, Kingsway, London, W.C.	—	—	sq. yard	Prices	on applica	tion.
Patent Plaster	Hollow interlocking blocks	Havelock Patent Plaster Partition Co.	63, Finsbury Pavement, E.C.	29 × 17	70lbs.	super. yard.	3s. 6d.	4s. 6d.	6s. *
Plaster	Partition slabs	Jabez Thompson & Sons	Northwich, Cheshire	12 × 12 × 2	—	sq. yard	3s. 6d.	4s.	—
Porous Brick	Porous terra-cotta blocks	Hempstead Patent Brick Co.	Hemel Hempstead	9 × 12 × 1½	—	sq. yard	2s.	2s. 4d.	—
Terrawode Brickwood	Partition bricks	Jabez Thompson & Sons	Northwich, Cheshire	9 × 4½ × 3	2 tons	1000 sq. ft.	£3 5s.	£4 9s.	—
School	—	John Stones	"Rosside," Ulverston	—	—	—	Prices	on applica	tion.
Pavement Lights	Prismatic	St. Pancras Ironworks Co.,	171, St. Pancras Road, London, N.W.	—	—	per ft. super.	—	From 4s. 6d.	—
Photo Prints, Copies, &c.:									
"True to scale"	(Dorel system)	W. F. Stanley & Co., Ltd.	13, Railway Approach, London Bridge, S.E.	Imperial	—	2 copies	—	—	2s. 3d. p. free.
True scale	Dorel and photo-litho methods	Vincent, Brooks, Day & Son, Ltd.	48, Parker Street, Kingsway, London, W.C.	—	—	—	Prices	on applica	tion.
All Kinds	On any material	London Drawing and Tracing Office.	98, Gray's Inn Road	—	—	—	Prices	on applica	tion.

* Executed.

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Builders' Current Price-List of Specialities—*(continued).*

Goods.	Description.	Merchants or Manufacturers.	Address.	Size.	Weight	Quantity. per	Price.		
							On Rail,	Dlvrd. at London Termini.	Dlvrd. to Buyr.
Pipes:									
Columbian	Armoured cement for water and sewage conveyance	Columbian Fireproofing Co.	37, King William Street, London	—	—	—	Prices	on applica	tion.
Pipe joint paste	"Wisconsin" Graphite	G. F. Hopkins & Co	112, Westminster Bridge Road, London, S.E.	—	—	1 lb. to 60 lbs.	1s. 1d. to 6½d.	—	—
Plaster:									
Fibrous, &c.	For relief decoration	G. & A. Brown, Ltd.	167, Hammersmith Road, W.	—	—	—	Prices	on applica	tion.
Keene's & Parian	——	Associated Portland Cement Mnfrs. (1900), Ltd.	Dixon House, 72, Fenchurch Street, E.C.	—	—	—	Prices	on applica	tion.
"Pytho"	For interior plastering	Plaster, Brick, and Stone Co., Ltd.	Wall Grange, near Leek, Staffs.	—	1 ton	—	37s. 6d.	42s. 2d.	—
Rainwater Heads and Pipes:									
Rainwater Heads	Cast lead and iron	George Wragge, Ltd.	London and Manchester	stock designs	—	each	From 16s. 6d.	17s. 6d.	—
Roofs:									
Ruberoid Roofing	High-grade prepared roofing	Robert W. Blackwell & Co., Ltd.	59, City Rd., London, E.C.	36×72	40lbs. to 100lbs.	216 sq. ft.	—	½ ply, 17s. 4d.; 2 ply, £1 6s. 6d.	1 ply, 20s. 6d.; 3 ply, 34r. 6d.
Steel	Principals and corrugated iron	E. F. Blakeley & Co.	Vauxhall Ironworks, Liverpool	—	—	ft. super.	—	From 6d. upwards.*	—
Sanitary:									
Engineers' Appliances	Baths, lavatories, closets, pipes, cisterns, pumps, &c.	Young & Marten, Ltd.	Stratford, E.	—	—	—	Prices	on applica	tion.
Syphons and Tanks	Automatic flushing	Adamsez, Ltd.	Scotswood-on-Tyne	—	—	each	£1 to £3	—	—
Waste Preventers	"Paisley," painted	Doulton & Co., Ltd.	Lambeth, London	2 gallon	—	each	£1 3s. 6d.	—	—
Waste Preventers	"Well," painted	Doulton & Co., Ltd.	Lambeth, London	2 gallon	—	each	16s.	—	—
Scaffolding:									
Putlogs	Hewn birch	Vigers Bros.	67-68, King William Street, E.C.	—	—	dozen	5s. 3d. in docks	—	—
Shutters:									
Revolving	No. 7 convex wood lath	Clark, Bunnett & Co., Ltd.	New Cross Road, London, S.E.	—	—	ft. super.	1s. 6d.	—	—
Signs	Anything and Everything	H. B. Torode	22, Henrietta St., Strand	L.C.C. regulation size	—	—	Prices	on applica	tion.
Sinks:									
Glazed Ware	"Krator," "Helios," "Belfast," and "Edinburgh"	Adamsez, Ltd.	Scotswood-on-Tyne	—	—	each	10s. to £5	—	—
Slates and Slating:									
"Arfon" Slates	Unfading green	Pearson Bros. & Campbell	18, Water St., Liverpool	—	—	—	Prices	on applica	tion.
Buttermere or Cumberland & Westmoreland Green Slates	Light sea green, olive, and dark	Buttermere Green Slate and Stone Works	Keswick	30 to 12 long	—	ton	£4 5s.	£5	—
Slating and Tiling	All kinds — green slating speciality	Roberts, Adlard & Co.	London, Faversham, Brighton, &c.	as required	—	1 000	Prices	on applica	tion.
Slates and Slating	Portmadoc, French, and American	Young & Marten, Ltd.	Stratford, E.	—	—	—	Prices	on applica	tion
Sound-Proofing:									
Deafening Quilt	Cabots' double ply	Arthur L. Gibson & Co.	19/21, Tower St., Upper St. Martin's Lane, London, W.C.	—	120 lbs.	bale, 500 sq. ft.	36s. 6d.	—	—
Springs:									
Door Checks	"Blount"	Charles Winn & Co.	Birmingham	—	—	—	Prices	on applica	tion
Stone:									
Bramley Fall	Sandstone, light and grey	B. Whitaker & Sons, Ltd.	Horsforth, near Leeds	any sizes	14ft. to 1 ton	cube ft.	10d.	1s. 9d.	—
Granite	Architectural and monumental	Kirkpatrick Brothers	Trafford Park, Manchester	—	—	—	Prices	on applica	tion
Dark-Bed Hopton Wood	Hard limestone, colour grey	J. Hodson & Son, Ltd.	Nottingham	random blocks	—	foot cube	1s. 2d.	2s.	—
Yorkshire	Sandstone, various colours	J. Hodson & Son, Ltd.	Nottingham	random slabs	14ft. cube to ton	foot cube	From 2s.	From 2s. 10d.	From 3s.
Staircases:									
Spiral	——	St. Pancras Ironworks Co., Ltd.	171, St. Pancras Road, London, N.W.	From 3ft. 6ins. diam.	—	per ft. rise	—	From 13s.	—
Terra-cotta:									
Window Heads	Buff or red	Walwyn T. Chapman	Cleethorpes	3×9 4½×10	1 cwt.	each	5s.	—	—
Tiles:									
Coloured Enamelled	Best quality in brown, blue, green, &c.	Carter & Co.	Encaustic Tile Works, Poole.	usual sizes	1 ton	55 yds. sup.	10s. 6d. per yd.	11s. per yd. sup.	11s. 2d. per yd.
Tessellated	Best quality any plain pattern	Carter & Co.	Encaustic Tile Works, Poole.	usual sizes	2 tons	80 yds. sup.	5s. per yd. sup.	5s. 4d. per yd.	5s. 6d. per yd.
Decorative	Floor	Craven, Dunnill & Co., Ltd.	Jackfield, R.S.O., Shropshire	every size	56 lbs.	sq. yard	from 3s. 6d.	4s. 6d.	4s. 6d.
Ditto	Wall	Craven, Dunnill & Co., Ltd.	Jackfield, R.S.O., Shropshire	—	40 lbs.	—	from 5s. 6d.	6s. 4d.	6s. 4d.
Ditto	Mosaic	Craven, Dunnill & Co., Ltd.	Jackfield, R.S.O., Shropshire	—	48 lbs.	—	from 13s. 9d.	15s.	15s.
Ditto	Faience	Craven, Dunnill & Co., Ltd.	Jackfield: R.S.O., Shropshire	—	170 lbs.	—	from £1 3s.	£1 5s.	£1 5s.
"Opalite"	Opal glass, with Shelmerdine backing	Wm. Griffiths	126, Hamilton Ho., Bishopsgate St., Without, E.C.	9×3 and 6×6	—	sq. yard	—	—	10s. 6d.†
Wall	Patent undercut back	T. & R. Boote, Ltd.	Burslem	6×6	50 lbs.	sq. yard	6s.	6s. 6d.	6s. 9d.‡
"Durolite"	Glass tiles, with patent fireproof backing to prevent surface cracking	Durolite Ltd.	36, Camomile Street, London, E.C., and St. Helens, Lancashire	white and tinted 6×6 and 9×3 marbled 12×6	—	sq. yard	—	—	white† 10s. 0d. tinted† 11s. 6d. mrbls.† 12s. 6d.
Timber:									
Planks	Dry Mahogany and Oak	James W. Southern & Son	Store Street Saw Mills, Manchester.	—	—	—	—	—	—
Tracing Cloth:									
"Ivorine"	Pure white	Norton & Gregory, Ltd.	Castle Lane, Westminster	30ins. × 24yds.	—	roll	—	—	22s. 6d.
"Koh-i-noor"	——	L. & C. Hardmuth	12, Golden Lane, London, E.C.	30, 36, 40, 42	—	roll of 24 yds.	Prices	on applica	tion.
"Triumph" Brand	Blue	Norton & Gregory, Ltd.	Castle Lane, Westminster	30ins. × 20yds.	—	roll	—	—	12s. 6d.
Urinals:									
Glazed Ware	Circular slab and T-backs	Adamsez, Ltd.	Scotswood-on-Tyne	—	—	stall, with fittings	£3 to £15	—	—
Ventilators:									
"Acme" & Spherical	Exhausts and intakes	Acme Ventilating & Heating Co.	35, Tarleton Street, Liverpool	6ins. to 24 diam. tube	—	each	—	—	17s. 6d. to £15.
Boyle's Patent	Latest "air-pump" ventilators (design No. 175)	Robert Boyle & Son	London and Glasgow	12ins. to 54ins. diam.	—	each	—	—	25s. to £18 18s.
Vices:									
"Lightning"	Instantaneous action	C. Nurse & Co.	181-183, Walworth Road, London, S.E.	jaws 9 ins. opening 12	50 lbs.	each	17s.	—	—

* Erected. † Approximate price fixed, complete, in London. ‡ Executed.

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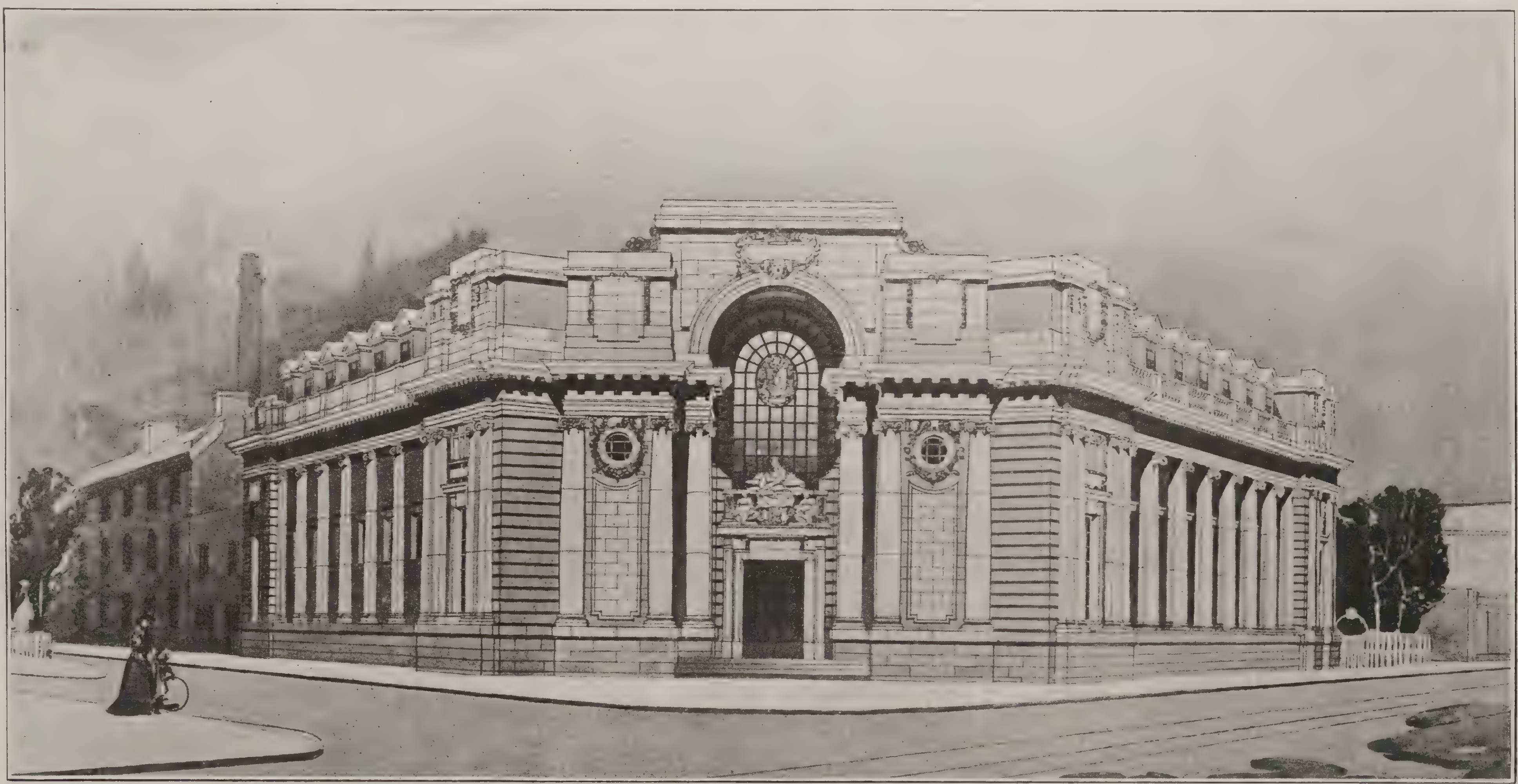
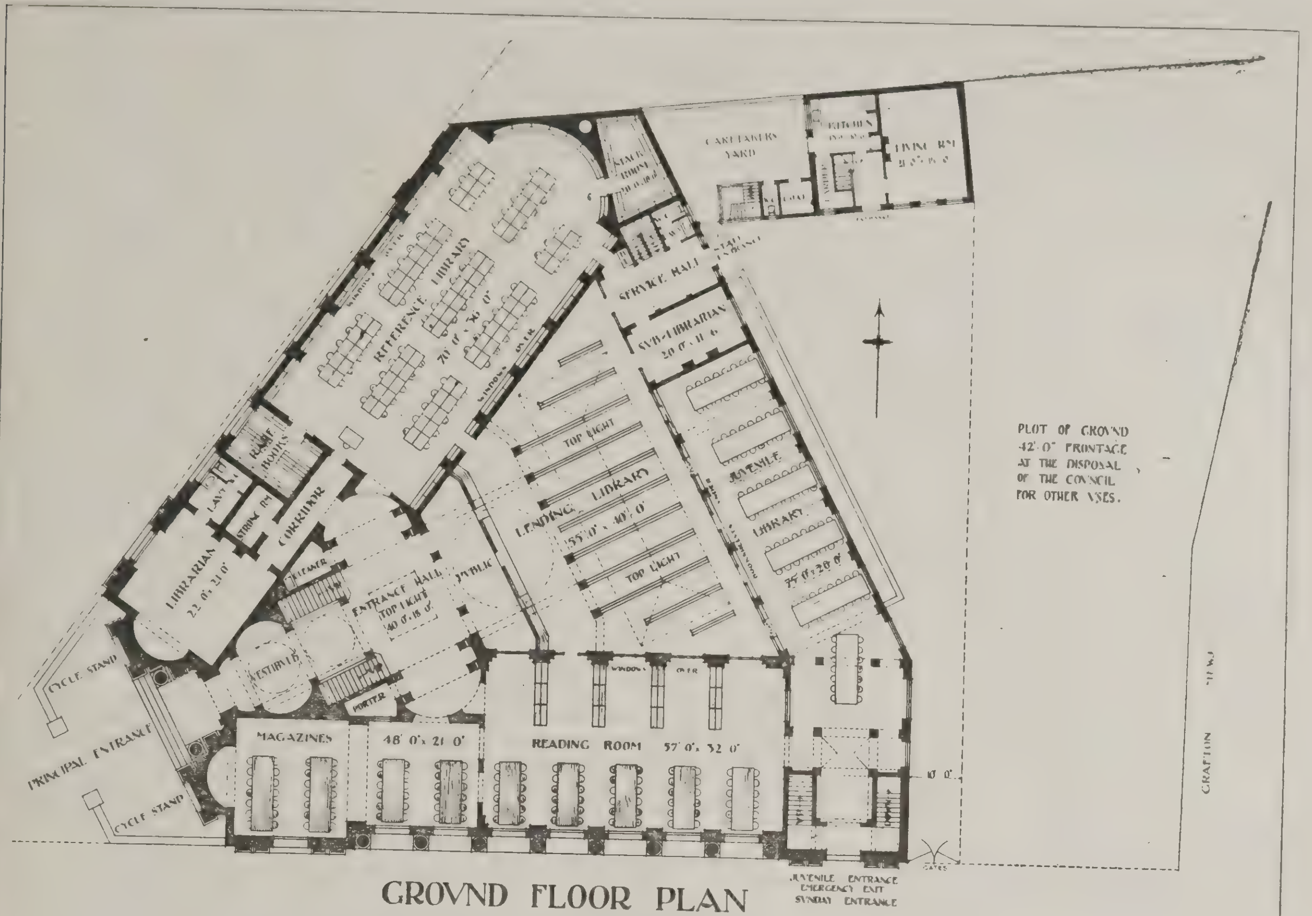
Municipal Builders. THE Secretary of the London Municipal Society, writing to the *Standard*, raises the important question of the efficiency of the London County Council Works Department. His remarks were called forth by the publication, in the Council's agenda, of the report of the Works Committee. The result of all works completed during the half-year ended March 31st last, as reported, is that the balance of cost below the final certificate is £52,589. In this report it was also admitted that the Committee had benefited by the general fall in the price of materials since the estimates were made. This sum of £52,589 is represented as a saving to the ratepayers of London. Of course, as this correspondent points out, whether it is so or not depends upon the sum for which contractors would have undertaken the work. Now, in former years the critics of the London County Council were in the unfortunate position of having little or nothing to go upon, but we are now in the possession of some comparative figures. A survey of the London County Council minutes during 1904 to 1905 shows that the contractors tendered as a rule considerably below the estimates of the Council's estimating officials. In fact, on thirteen works, quoted by the correspondent above referred to, that were undertaken by contractors the accepted tenders amounted to £1,841,238, whereas the estimates amounted to £2,183,906, leaving a balance below the estimates of £342,667, or 15·69 per cent. Comparing this with the last two returns of the Works Department, it appears that the department executed the works it undertook at £80,375 below the estimated cost, or 13·30 per cent. This does not compare very favourably with the 15·69 saving of the contractors. It is true that the contract figures are not taken on the basis of final certificates and cost, this information not being easily obtainable. Nevertheless, on the face of it, the correspondent's plea that contractors are doing work at less cost than the Works Department seems to warrant the closest attention. We have given it as our opinion before, and we still hold to it, that the London County Council Works Committee ought never to have been allowed to burke criticism by bottling up information. It is quite impossible to determine whether the department is paying or not as a whole, and presumably this is what the Progressives and the Labour members would wish. We know the reason which was urged, when first established—namely, that contractors could not be got to compete with the Works Department, but later events have shown that this prejudice is now removed. The contractors are prepared to enter into the lists, and do in several municipalities, in competion with the Public Works Departments. Another suspicious circumstance is that the Progressive majority have refused to allow representation on the Works Committee to their opponents in the Council. We hold no brief for either political party, but we do think that the work of public bodies should be open to the closest inspection. We admit that the Works Department does its work well, but apparently it does it at a greater cost than would result from contractors. We are willing to admit that it might be advisable that jobbing work should be done by the direct employment of labour by municipalities, although this is open to abuse; but in regard to the larger contracts it is natural to expect that the cost of administration by public officials or establishment charges should be heavier than it would be in the case of a private firm, while there are the additional features of a stagnation of talent, and a tendency on the part of the workmen to do less for a municipality than for private individuals. The London County Council Works Department, too, is given exceptional advantages in the way of borrowing money at a low rate of interest, and yet, apparently, cannot compete in cost with outside contractors.

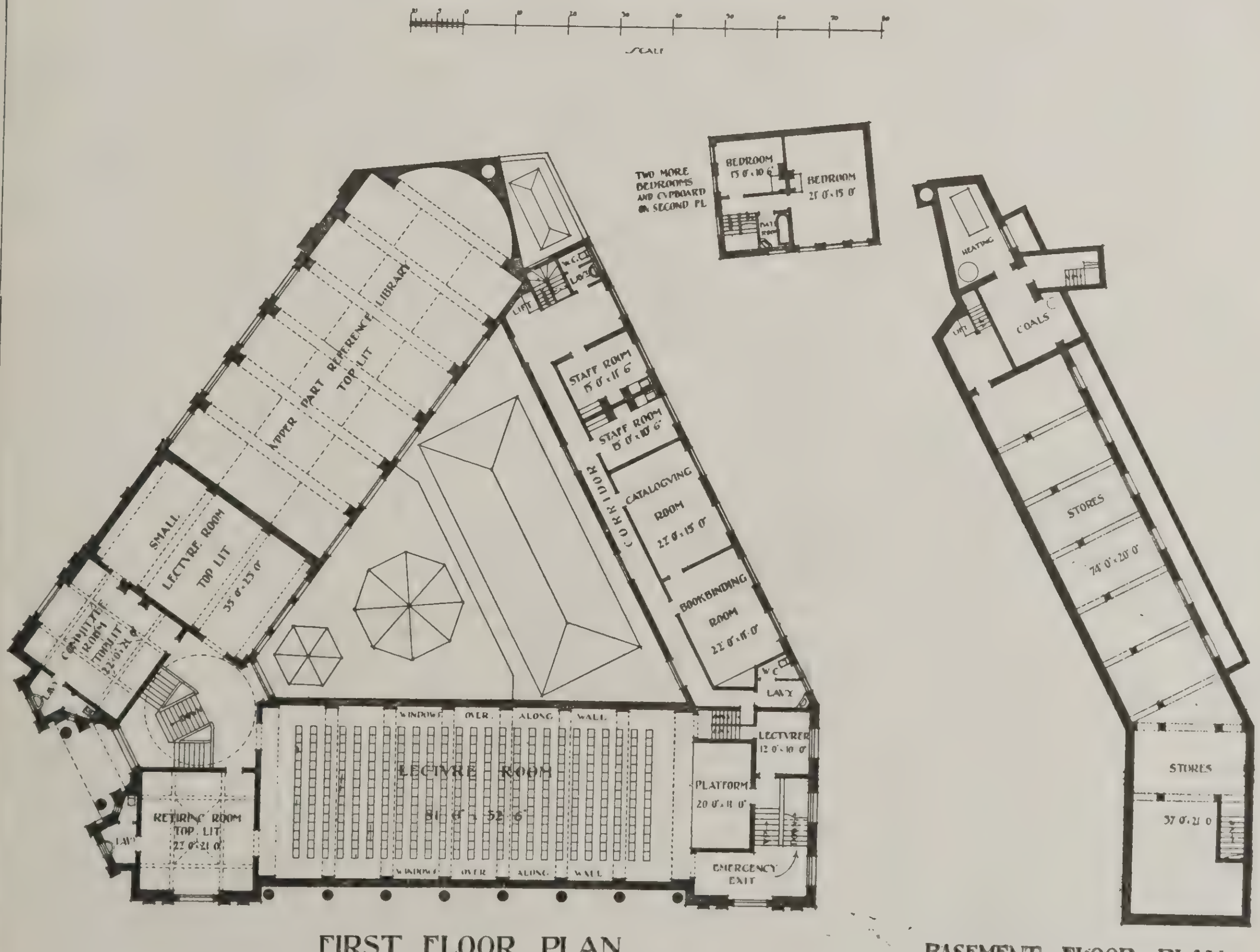
Genius and Originality. WE are accustomed to hear that genius must take care of itself, and that apparently like the wind it blows where it listeth. Our educationists have for long scouted any idea of considering in their scheme of things the genius. Our schools are engaged in instilling in the shortest time into the greatest number a modicum of knowledge drawn up upon a more or less cast-iron syllabus. The pupil is more or less machine-made. He more or less looks at things in the same way as his fellows, and he is not required to think for himself. Originality in the teacher is discouraged, and originality in the student tends to be stamped out. Architectural education seems to be going the same way. The educational enthusiasts in the profession are busy compiling universal syllabuses, and supporters of registration openly express their disregard for the genius, refuse to trouble about whether he is to have obstacles placed in his path, and state that they would prefer one dead level of respectable mediocrity rather than a few flowers in a barren land. The last as it may be, but we would urge the importance of paying attention to the genius. One genius in our view is worth very many ordinary mortals, however talented, because he is an original thinker, a leader of thought. The word genius in its original sense denoted a person's guiding spirit, and from this it became used to denote that intellectual power which has the appearance of proceeding from supernatural inspiration. In this sense it is generally used to-day—*i.e.*, to denote native power in an artist or other thinker. Genius signifies imaginative creation, original thought, invention or discovery, and is contrasted with talent. But if its processes are difficult to analyse and those of talent are not, it does not follow that they cannot be analysed. Genius has been called an infinite capacity for taking pains. So far it may be native and inborn, but even so it can be fostered. The architectural student should be encouraged to think for himself, to think originally, and to take pains, and we may succeed in obtaining a greater crop of geniuses. At any rate, we leave open the road for the architect of genius, rather than putting obstacles in his way, and, perhaps, preventing him practising. Our teachers and our teaching should have originality.



CENTRAL LIBRARY, ST. PANCRAS: SELECTED DESIGN. RUSSELL AND COOPER, ARCHITECTS.


CARETAKERS YARD
KITCHEN
LIVING RM 21' 0" x 15' 0"
STACK ROOM
STAFF ENTRANCE
SERVICE HALL
SUB-LIBRARIAN 20' 0" x 11' 6"
REFERENCE LIBRARY 70' 0" x 36' 0"
RARE BOOKS
LAVY
STRONG RM
CORRIDOR
LIBRARIAN 22' 0" x 21' 0"
ENTRANCE HALL TOP LIGHT 30' 0" x 18' 0"
PUBLIC
TOP LIGHT
LENDING LIBRARY 55' 0" x 40' 0"
TOP LIGHT
JUVENILE LIBRARY 35' 0" x 20' 0"
PLOT OF GROUND 42' 0" FRONTAGE AT THE DISPOSAL OF THE COUNCIL FOR OTHER USES.
VESTIBULE
PORTER
CYCLE STAND
PRINCIPAL ENTRANCE
CYCLE STAND
MAGAZINES
48' 0" x 21' 0"
READING ROOM 57' 0" x 32' 0"
WINDOWS OVER
10' 0"
GRAFTON
GATES
JUVENILE ENTRANCE
EMERGENCY EXIT
SUNDAY ENTRANCE

GROUND FLOOR PLAN


SCALE
TWO MORE BEDROOMS AND CUPBOARD ON SECOND FL
BEDROOM 13' 0" x 10' 6"
BEDROOM 21' 0" x 15' 0"
UPPER PART REFERENCE LIBRARY TOP LIT
LIFT
W.C.
LAVY
STAFF ROOM 15' 0" x 11' 6"
STAFF ROOM 15' 0" x 10' 6"
CORRIDOR
CATALOGUING ROOM 22' 0" x 15' 0"
BOOKBINDING ROOM 22' 0" x 15' 0"
SMALL LECTURE ROOM TOP LIT 35' 0" x 23' 0"
COMMITTEE ROOM TOP LIT 22' 0" x 21' 0"
LAVY
RETIRING ROOM TOP LIT 22' 0" x 21' 0"
WINDOWS OVER ALONG WALL
LECTURE ROOM 81' 0" x 32' 6"
LECTURER 12' 0" x 10' 0"
PLATFORM 20' 0" x 11' 0"
EMERGENCY EXIT
HEATING
LIFT
COALS
STORES 74' 0" x 20' 0"
STORES 37' 0" x 21' 0"

FIRST FLOOR PLAN

BASEMENT FLOOR PLAN

CENTRAL LIBRARY, ST. PANCRAS: SELECTED DESIGN. RUSSELL AND COOPER, ARCHITECTS.

ST. PANCRAS LIBRARY COMPETITION.

We illustrate in this issue the selected design for the central library for the borough of St. Pancras. A meeting of the Borough Council was held on Wednesday evening last, when the award of the assessor (Mr. John Belcher, A.R.A.), was adopted. The competition was limited to the following architects:—Messrs. Russell & Cooper, Wills & Anderson, Maurice B. Adams, Cross & Mallows, J. S. Gibson, and E. W. Wimperis—each of whom received an honorarium of £40. The design selected was numbered 5. The site for the library is a corner one, at the junction of Prince of Wales Road and Anglers' Lane. The disposition of the rooms is shown by the plans on the preceding page. The principal entrance opens into a top-lighted hall, off which all the public rooms are entered (except the juvenile library, to which there is a separate entrance). The lending library has a counter 37ft. long and indicators for 24,000 volumes; the stack-room behind being top-lighted, with 422ft. of shelving, spaced at 5ft. 6in. centre to centre—equal for 42,000 books. The exterior is proposed to be carried out in Luton stocks with stone dressings; floors of rooms to be laid with wood blocks, and halls, &c., with marble mosaic. A price of 10d. per ft. cube has been allowed by the architects, which, for 456,864 cubic feet, works out at £19,036 (inclusive of quantity surveyors' fees). Adding to this £960 for architects' fees, the total estimated cost is £19,996.

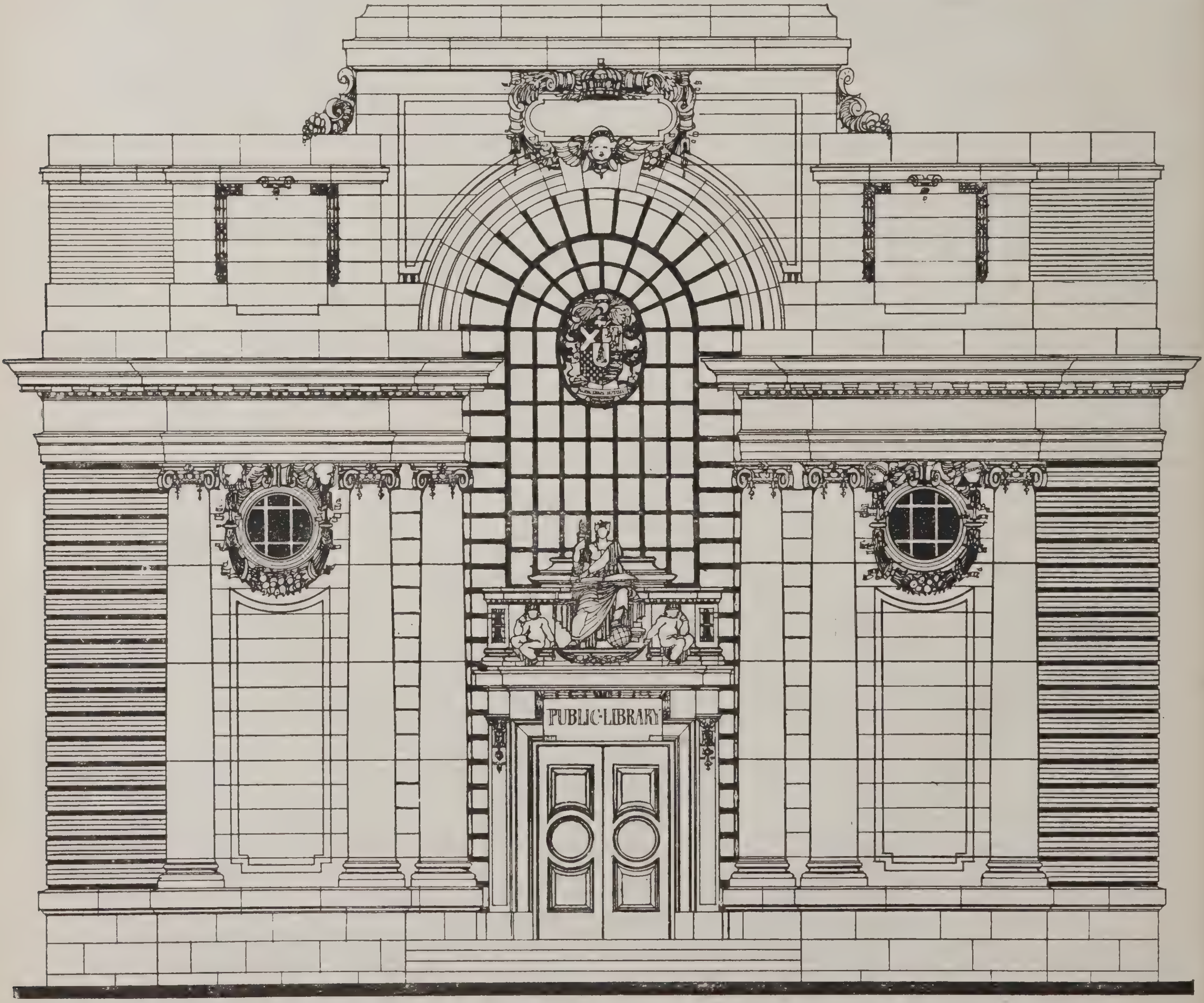
Notes on Competitions

Wesleyan Church, Wallington, Surrey.

In the competition for the above new church the committee have awarded first place to the design of Mr. Frank Windsor, of Croydon, whose design has been accepted from a selection of thirty-two submitted names of architects, with a final selection from drawings submitted by six. The second-premiated design is by (the late) Mr. W. D. Church, of South Place, and the third-premiated design by Mr. H. A. Woodington, of Jermyn Street, London. Accommodation is provided for 600 seatings, and the plan has a large central nave with ambulatories. Exterior work to be carried out in Kentish rag. The architect's estimate, without tower, is £6,640.

Convalescent and Nurses' Home, Glossop.

The issuing, by the Corporation of Glossop, of supplementary information in reference to the conditions of the competition for a Convalescent and Nurses' Home marks one of the most satisfactory results of competitors' protests against impossible conditions that has occurred in recent times. The original conditions were reviewed in these pages on May 30th last, and were of an extraordinary nature, the most objectionable features being—to quote from the Competition Reform Society's disapproval notice of May 24th—"No definite undertaking as to appointment of a professional assessor. No undertaking that the first or any of the designs will be executed. Insufficient information in conditions." The objection, tersely stated in the above notice as "insufficient information," was the one which arose from the extraordinary requirements of the conditions which invited architects to supply particulars of a scheme showing how a sum of £30,000 could effectively be disposed of in a fully furnished and equipped building, the cost of which was not to exceed £6,000, and in investment to yield an income sufficient for the complete support of the establishment and staff. What this meant to the unfortunate competitor will, no doubt, be obvious and need not now be re-stated, having previously appeared in these columns. Suffice it to say that architects were asked to do that which ought to have been done—and, in fact, which could only have been satisfactorily done—by the promoters. The first gleam of hope for better things appeared in a communication from the Town Clerk, which stated that it was intended to revise the conditions and extend the time for sending in designs. The gleam strengthened to a ray when it was subsequently announced



CENTRAL LIBRARY, ST. PANCRAS: SELECTED DESIGN. DETAIL OF ENTRANCE. RUSSELL AND COOPER, ARCHITECTS that the committee had decided to appoint an assessor and to forward particulars of supplementary information to the architects desiring to compete, but that before doing so it was the intention of the committee to visit one or two institutions to enable them to give some idea as to the accommodation to be provided. The ray is now a glow, for the supplementary information is to hand and all is well. The Corporation have decided to appoint Mr. Paul Ogden, F.R.I.B.A., of Manchester, as assessor. If Mr. Ogden has not been already appointed he would appear to have been consulted, for the new particulars have been drawn up with a full knowledge of the requirements of a competition. Provided there is no valid reason to the contrary, the architect whose design is placed first by the assessor will be employed to carry out the work and will be paid in accordance with the recognised scale of charges. The whole of the designs, with the exception of the one placed first, will be returned to the authors, carriage paid, after exhibition. The drawings are no longer to be sent in under motto, but are to be accompanied by a sealed envelope containing the author's name and address; the latter and the drawings will be numbered in the order in which they arrive. Each design is to be accompanied by a declaration that the design is the personal work of the competitor, and that the drawings have been prepared under his own supervision. The competing architects will have an opportunity of viewing the drawings. Full particulars are given of the nature and extent of the accommodation required, and mention is made of the nature of the available local building material. The option of furnishing the particulars of scheme mentioned in the original conditions is left with the competitors. The date for sending in designs has been extended to September 21st, 1906. Thus have all the objections been removed, and nought remains to be said except to congratulate the Corporation upon their courtesy in lending ear to protests and suggestions and upon the breadth of mind they have displayed in their reconsideration of the subject. One point only is left in doubt—namely, the cost of the building. Is the original estimate of £6,000 to stand, or are competitors to place a valuation upon the cubical contents of each block which they are required to figure on the block plan? No doubt this is a matter which will be settled in the replies to competitors' questions.

List of Competitions Open.

DATE OF DELIVERY	COMPETITION.
—	COTTAGE HOSPITAL, LYDNEY. Cost £1.000. Premiums of £5 and £2. Particulars from T. A. H. Smith, hon. secretary Hospital Commitee, Lydney, Glos.
Aug. 18	CHURCH EXTENSION, MAESTEG, Particulars from T. Rees, secretary Bethania Chapel, Maesteg, Mon.
Aug. 21	CEMETERY AND CARETAKER'S HOUSE, STEWARTON. Particulars from James Kerr, clerk to Parish Council, Stewarton, R.S.O., Aryshire.
Sept. 20	SCHOOL AT SUNDERLAND. Limited, to local architects. Premiums of £5o, £20 and £10. Particulars from John W. Moncur, borough engineer, Town Hall, Sunderland.
Sept. 28	SEWAGE DISPOSAL SCHEME FOR ELLESMERE. Premium of £20. Particulars from R. E. Lloyd, Clerk to Urban District Council, Ellesmere.
Sept. 29	REBUILDING OF HENSHAW'S BLIND ASYLUM AT MANCHESTER. Limited to Manchester architects. Premiums £100, £50, and £25. Assessor, Mr. John Holden, F.R.I.B.A.
Oct. 1	ALPHABET COMPETITION. Prizes of £20, £10 and £5. For particulars see "Architectural Review."

Correspondence.

L.C.C. County Hall Competition.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—I cannot agree with the statement in your issue for last week that "the announcement will be read with pleasure," &c. I think (with some other London architects) that the terms of this competition as published are *most* unsatisfactory—clearly made for the benefit of foreign architects on the one hand, and, on the other, for the exploitation of the "big wigs" of the Institute, "members of Council," &c. —Yours truly,

HORACE T. BONNER.

LONDON.

[In the *Standard* of Thursday last Mr. Bonner writes as follows in regard to this competition:—"In the final competition eight well-known or so-called 'eminent architects' are to be invited to compete. These favoured eight will come in after the competitors in the preliminary competition are selected, and . . . no doubt . . . will be selected by the Royal Institute of British Architects, which body will probably appoint an assessor to adjudicate upon the whole of the designs. Whether these eight eminent architects will have the benefit of inspecting the designs sent in for the preliminary competition I know not; but I feel assured that the Institute assessor will almost of a certainty recommend one of the eight eminent architects to carry out the work. There is very little chance of success for an ordinary lay member of the profession in this competition under the present conditions, as laid down by the London County Council. The successful man will be, no doubt, either some past vice-president, or a member or past member of the Institute Council, and hence one who will be well known to the assessor or assessors—for Institute assessors know no man professionally outside the Institute's inner circle . . . ."]

[We agree that there is no occasion to make this competition an international one; we think it certainly should be limited to architects practising in this country; but in regard to the appointment of the assessors, and Mr. Bonner's remarks about the Institute, we think it only fair to recall the recommendations of the Establishment Committee (as given in our issue for last week) that "there should be two assessors for the preliminary competition and three for the final, and that Mr. W. E. Riley, the Council's architect, and Mr. Norman Shaw, R.A., should be nominated to act in both stages, and that the competitors in the final stage should vote for the third assessor, who will only act in that stage." Mr. Riley, it is true, is a Fellow of the Institute, but he is by no means a "big wig" in the sense which Mr. Bonner suggests, while Mr. Shaw is, of course, quite outside the Institute. We think, therefore, the charge against the Institute in this case is not consonant with the facts. —Ed. B. J.]

Finchley Cottage Hospital.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—May I suggest that the difference between you and your correspondents, Messrs. Young and Hall, arises merely from a confusion of terms.

The words "Separation" and "Isolation" are often loosely used to describe the same room. To the hospital architect they convey separate and definite meanings. Separation rooms are required for the segregation of a patient requiring special nursing or treatment, or complete quiet; or, on the other hand, of a patient who is noisy, or likely in other ways to cause annoyance to the remainder.

The term "Isolation" as applied to a ward generally implies more serious—indeed, infectious—cases. It happens at times that a patient develops symptoms which give rise to suspicion of infectious disease. For such a case it is useful in all hospitals, small or large, to have a room set apart, and this room should be regarded as a temporary infectious ward; and certainly it should not be used for "paying patients." It is properly called an "observation ward." When the nature of the disease is clearly defined the case should, no doubt, be removed at once to the nearest fever hospital, unless, of course, circumstances render removal dangerous.

An endeavour appears to have been made in this competition to secure an ideal jury to judge the merits of the designs submitted. Its failure is, I fear, due to the fact that the architect member is not, as far as I am aware, intimately acquainted with hospital work. I trust he will forgive this expression of opinion which is made without animus or want of respect for him; but, in common with many others, I have suffered in the past from worthy and upright assessors who unfortunately lacked the necessary knowledge to judge special buildings.

May I add that I was not a competitor in this particular competition, having declined the Committee's kind invitation for personal reasons.

Yours faithfully,

A. SAXON SNELL.

LONDON, W.C.

[We must thank Mr. Snell for his lucid description of separation and isolation wards and their uses in a cottage hospital. We infer from his letter that he is in agreement with us upon the main issue —namely, that the best design has not been selected.—ED. B. J.]

Hove Library Competition.

To the Editor of THE BUILDERS' JOURNAL.

Sir,—I do not wish to revive this somewhat stale and unfortunate subject, but there is just one condition (rather an important condition I consider it to be) which loomed rather prominently in the particulars for the first competition for this building. This condition was that "the new library should accord in architectural style with the Hove Town Hall," which is in the same road and nearly opposite the site for the proposed library. I was further informed that the Corporation were desirous of keeping all their official buildings in that style.

Now, the Hove Town Hall, built by the late Mr. Waterhouse, is almost a replica of the original Prudential Assurance building in High Holborn, while the excellent reproduction of the accepted design (in the second competition) for the Hove Library, in your issue for July 11th last, shows a building of an entirely different "accord"—a poor classic design based upon examples at Hampton Court and the modern classic of the assessor, Mr. Belcher.—Yours truly,

HORACE T. BONNER, A.R.I.B.A.

LONDON, E.C.

Norwich Shirehouse Competition.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—My attention has only just been drawn to a letter, signed "Justice," in your issue for July 4th last, in reference to the above. The ratepayers of Norwich should greatly rejoice that they have such a champion as "Justice" ready to take up their cause unasked. Justice is usually represented as blind, but this "Justice" is evidently bereft of other faculties, or he would certainly have known that the people of Norwich have nothing to do with the Norfolk County Council, for whom were obtained the tenders published in your Journal. "Norwich is a city and county of itself" (see Kelly). As my estimate was added to after the competition, most people would gather that further work was ordered to be carried out, and this is what actually has happened. The Council has ordered further works not contemplated in the original particulars. My original estimate has been proved to be correct, taking the accepted tender in detail. Even now the complete scheme is costing £2,000 less than was voted in the first place for the building without these later additions. I hope I have made it clear that the Norwich citizens are not likely to complain, and that the ratepayers of Norfolk are saving on their original intentions. "Meddler" would have been a better pseudonym than "Justice."

Yours truly,
EDWIN J. TENCH, A.R.I.B.A.
NORWICH.

Llanidloes Public Hall Competition.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—In your issue for July 18th it is stated that in "open" competition Messrs. Shayler and Rigg's design for the Llanidloes Public Hall has been accepted. Some months ago architects were invited to send in their names if prepared to furnish competitive designs. I understand from enquiries made that five local Welshmen were invited, each of whom was to receive a fee 30 guineas, but one declined to compete after seeing the conditions, which reduced the number to four.

Yours truly,
X. X.

Pecksniff's Defence.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—I scarcely felt the prejudice of 50 years was likely, in any measure, to be dispelled by my letter, but I had hoped it might produce some better response than the mere gibes destitute of argument that have ever been our lot, and that I might be spared the tattered assumption that architecture is neither a trade nor a profession, but an art.

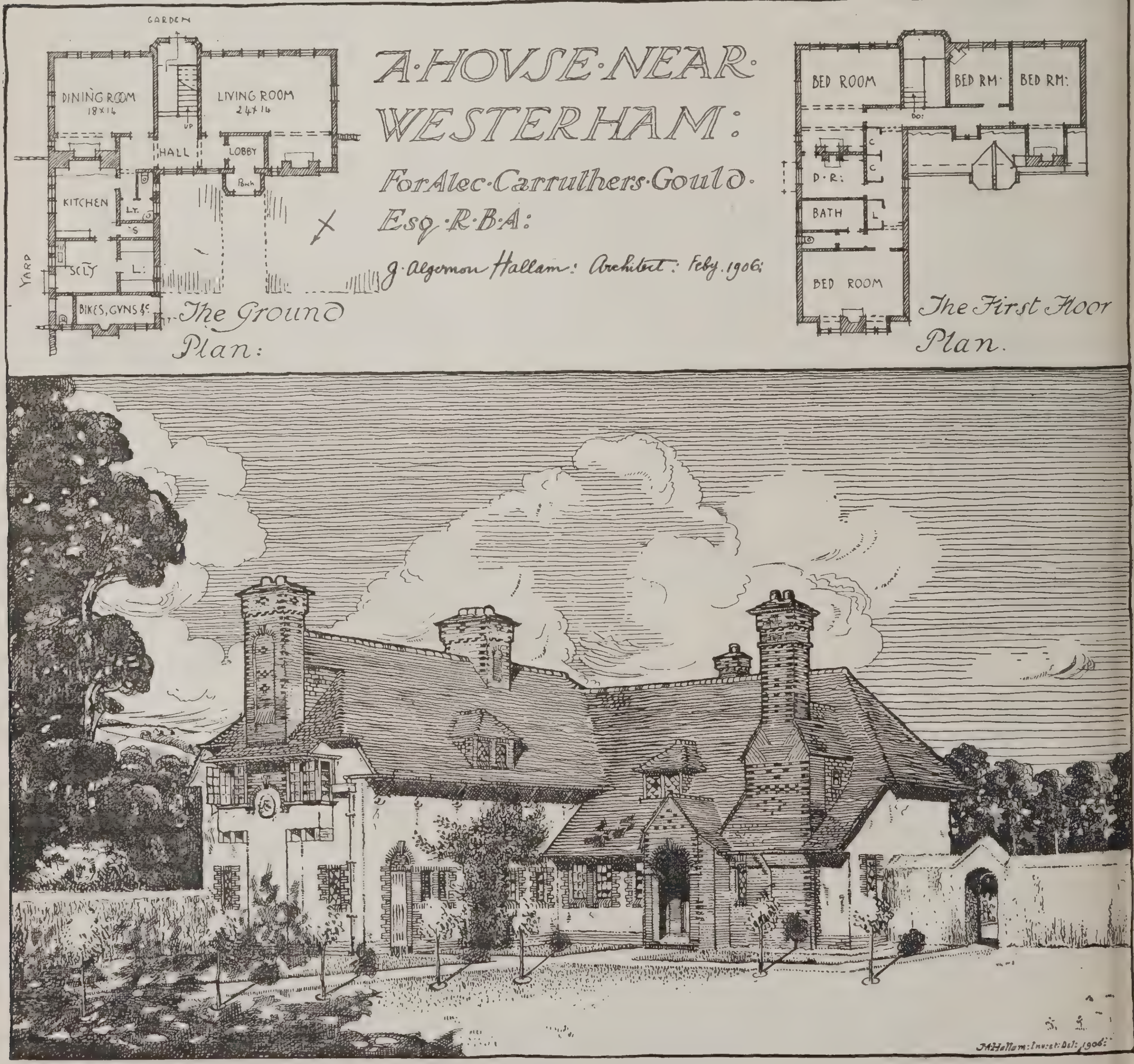
It cannot be contended that architecture as practised by moderns is an art (even if you exclude any able relatives), and Mr. Sampson, in his haste to call me names, shows ignorance of the Pecksniffian creed.

No true follower of my ancestor regards his profession as a mere means to personal gain. His sole aim is to obtain the best possible results; the monetary reward is but the just tribute to organised success.

We cannot but contemplate with infinite admiration and some amusement that ever decreasing band of valiant visionaries who, in an age of dominant commercialism, bravely prate of "their art," and essay to pit the puny vanity of purely personal achievement against the science of organised effort; we shall watch with exceeding regret their gradual disappearance—they, at least, adorn the profession.

I deeply deplore the necessity that compels me to adopt a pseudonym, but I shall be delighted to reveal my identity to Mr. Sampson. Perchance his enthusiasm might convert even me to his lofty but illogical ideals.

Yours truly,
PECKSNIFF MINOR.



Notes and News

Box Tunnel, on the Great Western Railway, has been entirely closed for repairs to the brickwork lining the roof.

A Sky-scraper with Steel Walls.—San Francisco is to have a fifteen-storey building, of which all the walls are to be of steel plates.

A new Pavilion at the Crichton Royal Institution, Dumfries, is to be built. The architects are Messrs. Sydney Mitchell & Watson, of Edinburgh.

A New Leaflet on the Ventilation of Churches has just been issued by Messrs. Robert Boyle & Son, the well-known ventilating engineers, of 64, Holborn Viaduct.

Glen Afton Sanatorium, New Cumnock, which has just been opened, was designed by Mr. Allan Stevenson, of Ayr. The building has at present 14 beds. The cost will be about £10,000.

A Baptist Church at Hertford is being erected from plans by Messrs. George Baines & Son, of London, at a cost of £2,251. Messrs. F. Wood & Co., of Luton, are the builders.

The Victoria Memorial Convalescent Home at Stirling has just been opened. There is accommodation for 16 patients, and the grounds cover 2½ acres. Mr. E. Simpson, of Stirling, is the architect.

The chancel of Warrington Parish Church is proposed to be restored at a cost of £5,000. The architects do not consider that there is any immediate danger of a collapse of this old building, but think it will not be safe to prolong the work too far.

Barrington Court.—The National Trust still requires £900 to complete its fund for the preservation of Barrington Court, Somersetshire. Donations or promises should be sent to Mr. Nigel Bond, secretary, the National Trust, 25, Victoria Street, Westminster.

A new Town Hall for Salford is proposed. The Town Hall Committee have asked the Corporation to authorise them to obtain alternative designs and estimates of the cost of a new town hall on the sloping ground in Peel Park, near the Victoria Arch, and for that purpose to engage an architect.

Mr. Walter Emden, J.P., after practising for nearly forty years as an architect, is retiring. The practice will be continued under the style of "Emden, Egan & Co.," by Mr. S. H. Egan, senior partner, Mr. W. S. Emden (nephew of Mr. Walter Emden), Mr. A. J. Croughton and Mr. T. C. Ovenston. Mr. Walter Emden is about to be married.

Festiniog Slate Trade: Cheerless Outlook.—The outlook for the slate trade at Festiniog remains as cheerless as ever. Since the depression set in twelve months ago nearly 600 fewer men have been employed at the quarries, causing a 30 per cent. reduction of the output. There is a huge stock on hand, particularly in the smaller sizes of slates.

South Norwood Congregational Church—The foundation stones of this church were laid last week. The present contract, which embraces the church, the tower up to the belfry stage, together with vestries, cloak-rooms, &c., amounts to £4,090, and has been let to Messrs. Walter Lawrence & Son, of Waltham Cross. A large future school is arranged for as part of the scheme. The architects are Messrs. George Baines & Son, 5, Clements Inn, Strand, London, W.C.

Institute of Sanitary Engineers.—Vol. IX., part 2, of the "Journal" of this Institute has just been issued from the offices, 19, Bloomsbury Square, W.C. It contains the following papers: "Estate Development," by A. A. Kemp; "Ventilation of Buildings," by F. Aldous; "Some Notes on the Liernur Improved Pneumatic Sewerage System," by Francis Liernur; "The Planning and Construction of Factory Buildings, with special regard to the application of armoured concrete," by A. Alban H. Scott.

An Office Building by Prof. Pite.—On the western side of Euston Square, with a main frontage to Euston Road, a new building for the London, Edinburgh and Glasgow Assurance Co., Ltd., is to be built from designs by Prof. Beresford Pite, F.R.I.B.A. The site is now being cleared, and it is expected that the foundation-stone will be laid in October, and that the company will be in occupation of their new premises by September, 1907. Mr. Gray Hill of Coventry, has secured the contract.

A Cement Block Church.—St. Joseph's Catholic Church, Sunderland, is being built entirely of cement blocks. The regular walling blocks are 2ft. 8in. long, 10in. deep, and 9in. wide; each weighing about 140lbs. The blocks are made on the premises, and two men can turn out about 120 blocks per day. Each block has a rough cast face for the outside, the other three sides being smooth, with three hollow spaces down each block, the middle one of which can be filled with cement as the walling proceeds.

A new Church, at Hon Green, Ross, has been erected at a cost of £3,000. It is in Gothic style, built of sandstone obtained in the neighbourhood, with facings and buttresses of Bath stone, and is covered with stone tiles removed from Queen's College, probably 400 to 500 years old. The roof is barrel shaped. The church divided by an oak screen made by Mr. Clarke, of Hereford. The flooring of the chancel is raised two steps above the church and is laid with black and white marble slabs. The floor of the nave and aisles is wood-block. Mr. G. F. Bodley, R.A., was the architect, and the builders were Messrs. Rattee & Kett, of Cambridge.

The New Good Warehouse for the North British Railway at Glasgow is 503ft. long by 321ft. broad, and 84ft. in height from the basement. There are three floors, each measuring about 3½ acres. The flooring is of "ferrolithic" and expanded metal. The building is all of brick and steel. There are 129 steel columns, each certified to bear about 600 tons weight; and the foundations for these columns consist of concrete 18ft. 6in. square, and 5ft. thick. On the top of this is solid blue brickwork finished off with steel joists, which are filled in with "ferrolithic." Ten sets of rails lead into the ground floor of this mammoth warehouse, and there is half a mile of platforms of brick and "ferrolithic." Everything will be worked electrically.

No. 17, Fleet Street.—The London County Council has now arranged that the Council Chamber, at 17, Fleet Street, the house so long, but incorrectly, known as the Palace of Henry VIII. and Cardinal Wolsey, can be viewed by the public between the hours of 10 and 2. In the evening the room will be available for meetings of societies and other bodies on application to the Council. The front, it will be recollected, was some time ago restored by the Council. In the Council Chamber above referred to the chief treasure is the plaster ceiling, the restoration of which has been a work of extreme difficulty. It was taken down in sections and removed to South Kensington Museum, where it was cleaned, straightened and strengthened before refixing. The staircase is of eighteenth century work and the stained glass windows are also a feature of interest. It is proposed to issue a handbook (illustrated with 12 views) descriptive of the architectural and historic interest of the place.

Law Cases.

Reinforced Concrete.—In the Court of Appeal last week the case of *Mouchel v. Cubitt & Co.* was heard. This was an appeal from a decision of Mr. Justice Swinfen Eady at the end of last June, which was an application for an interim injunction made in an action brought by L. G. Mouchel, agent for the Hennebique ferro-concrete patents, seeking to restrain the defendant builders and contractors from carrying out, or contracting to carry out, without the written consent of the plaintiff, any ferro-concrete or other similar work which might be in competition with that system, in breach of a covenant in those terms contained in clause 12 of a licence to use the system "within the town of London" granted them by the plaintiff on March 2nd, 1903. The restriction was found by the defendants to lead to inconvenience, and even loss of business in cases where their customers preferred some other system, and friction also arose between them and the plaintiffs. After some correspondence the defendants wrote on March 29, 1906, formally repudiating the restriction, of the validity of which they had begun to entertain doubts, and stating that with a view to raising the question at law they intended to use, under a contract for building at Messrs. Whitbread's brewery at Chiswell Street, E.C., reinforced concrete work according to a system which competed with but did not infringe the Hennebique patents. That contract was carried out under protest, but the plaintiff took no proceedings by reason of business relations existing between him and Messrs. Whitbread; but other instances having occurred in which he suspected breaches of the covenant in other parts of the country, these proceedings were commenced. Mr. Justice Swinfen Eady granted an interim injunction on the usual undertaking by the plaintiff as to damages. Defendants appealed,

Counsel for the appellants contended that the claim was unreasonable, and that the covenant in the licence was inoperative as being too wide and in restraint of trade.

Counsel for the respondent were not called upon by the Court, who declined to go into the question of the validity of the covenant, considering that to be a matter to be disposed of at the trial of the action; *prima facie* the plaintiff had a plain contract, and the defendants were committing a breach of it. A speedy trial of the action had been offered in the Court below, which had not been accepted, and on the balance of convenience their Lordships agreed with Mr. Justice Swinfen Eady and dismissed the appeal.

R.I.B.A. MIDSUMMER EXAMINATIONS.

Pass List.

The following is the pass list of the Midsummer examinations of the Royal Institute of British Architects :—

The Preliminary Examination,

qualifying for Probationer R.I.B.A., was held in London and the undermentioned provincial centres on June 12th and 13th. Of the 257 candidates admitted, 63 claims for exemption from sitting were allowed. The remaining 194 candidates were examined with the following results :—

District.	Number Examined.	Passed.	Relegated.
London	95	66	29
Belfast	11	8	3
Birmingham	2	2	—
Bristol	7	4	3
Cardiff	7	2	5
Glasgow	2	2	—
Leeds	19	12	7
Liverpool	12	8	4
Manchester	25	17	8
Newcastle	14	8	6
	194	129	65

The following passed candidates, with those exempted—numbering altogether 192—have been registered as Probationers :—

R. A. Abbott (Auckland, N.Z.)
R. Anderton (Bournemouth)
J. W. Arbuckle (Belfast)
H. K. Armitage (Stockport)
A. F. Ashford (Hoddesdon)
E. R. Austin (Bristol)
A. S. Averill (Nottingham)
P. Badcock (Leyton)
G. Bain (Aberdeen)
L. H. Bakes (Idle)
H. J. L. Barefoot (London)
G. Barlow (Manchester)
H. T. Barnard (London)
H. R. H. Bath (Salisbury)
O. K. Beattie (Edinburgh)
N. S. Benison (London)
G. Bennett (Gravesend)
J. N. Berry (Huddersfield)
J. H. Best (Belfast)
S. F. Beston (London)
E. A. F. Bisshopp (Ipswich)
F. Blackford (Edgbaston)
E. R. Blount (Ryde)
H. Bottomley (Stalybridge)
W. R. Box (Eastbourne)
J. S. Boyd (Glasgow)
W. T. Broome (Sydney)
W. A. Brown (North Norbury)
J. A. Bruce (North Shields)
L. H. Bucknell (London)
A. Burgess (Liverpool)
J. F. Cameron (London)
C. M. Cantley (Ipswich)
W. C. Caton (Hove)
B. Chaikin (London)
J. M. Clarke (Preston)
F. L. W. Cloux (London)
W. H. Coate (Luton)
W. F. Cole (Plymouth)
W. Coles (Barnsley)
W. B. Collier (Blackpool)
H. C. Constantine (London)
S. T. Cook (Plymouth)
L. Costley (Monifieth)
J. Coulthard (Carlisle)
J. F. Cowper (Manchester)
G. S. Creagh (Gillingham)
H. C. Crone (Richmond)
F. E. Crutchley (Liverpool)
F. E. Culling (Swaffham)
A. B. Dailey (London)
F. G. Dawbney (Reading)
N. T. Debogory (Bulgaria)
W. J. Dickinson (Gateshead)
F. S. Dod (London)
A. K. Dodds (Berwick)
G. Doyle (Bristol)
M. Duncan (Liverpool)
W. J. Durnford (London)
C. G. Eales (Hull)
L. R. G. Errington (London)
W. A. R. Fallon (London)
C. A. Farey (London)
R. W. Fellows (Nottingham)
G. A. Fortescue (London)
B. Fownes (Hastings)
J. H. Fulford (London)
E. T. Gale (Lee)
F. G. Geary (London)
E. G. Gisby (Stafford)
A. R. Gunn (London)
H. Halstead (Blackburn)
W. H. Hamlyn (Great Sutton)
C. H. Hartmann (Weybridge)
A. O. Hector (Crieff)
A. Hemingway (Wimbledon)
J. F. Hennessy, jun. (Sydney)
N. W. Hick (Scarborough)
G. F. Hillman (London)
H. E. Hinchliffe (Mytholmroyd)
F. W. Hipkins (Sheffield)
H. A. Hodgson (Birkenhead)
F. Holden (Blackburn)
L. Horsfall (Luddenden)
R. Hotz (London)
W. W. Houston (Belfast)
G. Howkins (Rugby)
F H. Howlett (Pontefract)
J. W. Howroyd (Bradford)
A. F. Hunt (London)
A. Ingham (Hebden Bridge)
D. W. Irving (Crewe)
R. Jackson (Shrewsbury)
T. S. James (Cardiff)
T. G. Jenner (Bath)
H. C. Jennings (London)
H. Jennings (London)
R. J. Johnston (Brighton)
M. Johnstone (Carlisle)
T. E. Jones (Port Dinorwic)
W. J. Jones (London)
W. H. Judges (London)
W. J. Kendall (Leeds)
J. Kennedy (London)
M. W. T. Klug (London)
F. W. Knight (Hitchin)
F. L. Kruckenberg (Ickley)
R. Lambert (Shipley)
C. A. Landsell (London)
F. B. Last (Harborne)
F. H. Lawson (Gosforth)
P. H. Lawson (Chester)
A. E. Leeson (Burnt Green)
T. E. Legg (Woodford Green)
A. D. Leroy (London)
H. R. Levy (London)
T. A. Lodge (Crookham)
C. W. Long (London)
A. Lowcock (Dronfield)
W. Lucas (London)
D. McF. McCaul (Chislehurst)
T. J. Mather (Denbigh)
R. E. Matthews (Coventry)
H. Moliver (London)
W. V. Morgan (Norwich)
F. H. Morley (Leicester)
H. E. Moss (Surbiton)
E. Nixon (Newcastle-upon-Tyne)
W. Oates (Halifax)
G. Owen (Warrington)
A. T. Parker (Southend-on-Sea)
W. Parker (Redditch)
S. C. Parrott (Luton)
J. Paterson (Berwick)
A. E. Peck (South Shield)
G. S. Peddie (Glasgow)
T. J. Peters (Newcastle)
H. B. Ponder (Hastings)
C. W. Porter (Manchester)
A. Pratten (Reading)
W. H. Price (Bridgwater)
W. J. Pywell (London)
T. Reive (Manchester]
R. T. Rhodes (Epping)
A. I. Richards (Yon Pentre)
N. V. Roberts (Bradford)
H. L. Robinson (London)
J. C. Rogers (Weybridge)
R. Rostron (Southport)
E. Roughley (S. Helens)
D. W. Rowntree (London)
H. J. Rowse (Liverpool)
G. Royle (Manchester)
E. C. Rycroft (Thornton Heath)
H. F. Saunders (Margate)
W. Shackleton (Bradford)
S. W. Sherren (Croydon)
A. G. Shoosmith (Hertford)
D. G. Shrubsall (London)
F. A. Silk (London)
E. Smith (Wisbech)
F. N. Smith (Nottingham)
H. F. Southcott (Sydney)
J. N. G. Stafford (Birmingham)
S. J. Stainton (Tipton)
H. C. Strickland (London)
E. J. Sutcliffe (Hebden Bridge)
H. Sutcliffe (Otley Road)
C. M. Swannell (London)
E. J. Tanner (Beckenham)
A. G. Taylor (Kingston-on-Thames)
F. Thorp (Southport)
J. H. Tiffen (Carlisle)
C. B. Todd (Hull)
A. A. G. Toone (Manchester)
F. Tranmer (Scarborough)
N. Tregelles (Hoddesdon)
A. C Tricker (Surbiton)
A. H. Turner (Caversham)
G. A Tyson (London)
S. F. G. Underwood (March)
C. Voysey (Chorley Wood)
F. W. Walker (Derby)
W. Waller (Barnsley)
F. R. Ward (Wednesbury)
A. Watts (Manchester)
P. E. Webb (London)
P. J. D. Webster (London)
J. Weinberg (London)
C. T. Whiteley (Shipley)
T. B. M. Wightman (Glasgow)
C. B. Willcocks (Caversham)
H. Wilson (Tadcaster)
W. Wood (West Bromwich)
C. Worssam (Elstree)

The Intermediate Examination

qualifying for *Student R.I.B.A.*, was held in London and the undermentioned provincial centres on June 12th, 13th, 14th and 15th. 156 candidates were examined, with the following results :—

District.	Number Examined.	Passed.	Relegated.
London	98	50	48
Belfast	1	1	—
Bristol	12	6	6
Glasgow	4	3	1
Leeds	15	5	10
Manchester	21	8	13
Newcastle	5	3	2
	156	76	80

The passed candidates, who have been registered as students, are as follows, the names being given in order of merit as placed by the Board of Examiners :—

P. K. Hanton (London)
J. C. Beare (Newton-Abbott)
F. T. Bush (London)
J. D. D. Watt (Falkirk)
J. Grieve (Bradford)
J. L. Hampson (Bolton)
H. H. Bradford (London)
H. L. Charles (Hereford)
A. F. Bryan (Leicester)
W. S. A. Emden (London)
R. W. Caldwell (Glasgow)
D. Colville (Aberdeen)
P. T. Adams (London)
B. V. Bartholomew (London)
R. Orr (Ringwood)
T. S. Hosking (Bristol)
T. H Whittaker (Nottingham)
C. H. Murray (London)
W. A. Rigg (Carnforth)
W. H. Mitchell (Sale)
H. L. Wrigley (Stourbridge)
R Stockton (Heaton Norris)
A. F. Pelling (Durham)
C. H. Rose (London)
T. C. Mannooch (London)
H. T. Rainger (Cheltenham)
W. S. Mills (Leicester)
A. H. H. Jenkins (Blackmill)
L. W. Walton (Nottingham)
J. McN. Jeffrey (London)
W. H. Wilson (London)
W. E. Woodin (London)
C. S. Madeley (Birmingham)
C. A. Aish (Kingston-on-Thames)
R. Wilson (London)
P. K. Kipps (London)
H. A. Dickman (Sherwood)
G. C. Wingrove (Newcastle-on-Tyne)
A. G. Sheath (Eastbourne)
C. D. Arnott (Gorleston-on-Sea)
M. D. Mattison (Weaste)
A. T. Scrivener (Stoke-on-Trent)
R. Pierce (Llanfairpwll)
H. E. Matthews (Yeovil)
A. C. Burtingham (Evesham)
R. H. Murray (London)
J. W. Carter (Rugby)
C. A. Hallatt (Wath-on-Dearne)
W. A. Daft (Oxford)
J. M. Scott (London)
T. Edgar (Belfast)
J. E. Bowness (London)
T. A. D'Arcy Braddell (London)
G. S. H. Bradford (London)
D. J. Campkin (Sutton)
G. S. Cockrill (Gorleston)
A. Cooper (Slough)
W. N. Couldrey (London)
C. W. Davis (Edgbaston)
R. Duckett (Preston)
H. B. Elkington (London)
W. A. M. Fiddaman (London)
G. E. Fitzgerald (London)
E. H. Foster (Thorne, Doncaster)
G. K. Gwynne (Bournemouth)
R. E. Haynes (Shrewsbury)
A. Kay (Pendleton, Manchester)
F. C McC. Maxwell (London)
A. F. Murray (London)
W. W. Tipton (Wellington)
A. Turnbull (Sunderland)
V. Ware (Bournemouth)
J. H. Wheately (Petersfield)
A. Wilby (London)
E. L. Wright (Stafford)
G. H. Yeoman (London)

The Final and Special Examinations,

qualifying for candidature as *Associate, R.I.B.A.*, were held in London from June 22nd to 29th. Of the 112 candidates examined, 61 passed, and the remaining 51 were relegated to their studies. The successful candidates are as follows :—

D. Bamford (London)
F. N. Bamford (London)
H. Blackadder (Broughty Ferry)
A. G. Bray (Bolton)
A. E. Brooker (London)
A. Bullock (London)
W. W. J. Calthrop (Horsham)
*H. R. Coales [Special Examination], Leatherhead
O. H. Cockrill (Great Yarmouth)
T. H. O. Collings (Brighton)
W. H. H. Cooke (Wembley)
R. W. A. J. Cosway (London)
M. J. Dawson (London)
H. B. Downs (Guiseley)
C. W. Eaton (Deane Bolton)
E. H. Edleston (Nantwich)
G. A. Farrar (Manchester)
*F. H. Fitzgerald (Special Examination)
F. J. Forster (London)
F. B. Foster (Weston-s-Mare)
*J. B. Fulton [Special Examination], (London)
E. H. Gandy (London)
L. M. Gotch (London)
A. C. Goulder (Woodford Green)
J. W. Hepburn (London)
G. B. H. Hoole (London)
*P. C. Hoy [Special Examination], (Heaton Mersey)
F. J. Humphrey (Surbiton)
D. B. Hutton (Glasgow)
*E. T. Jago [Special Examination], (London)
*G. T. Jell [Special Examination], (London)
E. R. Kennedy (Belfast)
H. G. Leslie (London)
C. C. Makins (London)
*H. J. C. Marshall [Special Examination], (London)
H. Moss (Manchester)
S. Moss (Eccles)
J. E. Mundell (London)
H. F Murrell (London)
*J. Newton [Special Examination], (Purley)
J. Parlett (London)
S. H. Penlington (Sudbury)
G. E. Phillips (London)
H. A. Rowbotham (London)
* J. Rycroft [Special Examination], (Bradford)
W. P. Rylatt (Leeds)
J. P. Salwey (Reading)
V. G. Santo (Shrewsbury)
W. P. Schofield (Leeds)
H. Shackleton (Keighley)
J. Smith (Glasgow)
F. A. Sprules (Sutton)
F. G. Stockdale (London)
C. R. Thickpenny (Watford)
W. I. Travess (London)
E. H. Walker (Doncaster)
E. G. Walker (London)
* B. M. Ward [Special Examination], (Liverpool)
B. Watson (North Shields)
B. C. Westwick (Mansfield)
* A. Woodeson [Special Examination], (Reading)

The following table shows the number of failures in each subject of the Final Examination :—

I.	Design	36
II.	Mouldings and Ornaments	34
III.	Building Materials	11
IV.	Principles of Hygiene	18
V.	Specifications	6
VI	Construction, *Foundations, &c.*	20
VII.	Construction, *Iron and Steel, &c.*	20

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* The candidates to whose names an asterisk is prefixed entered for the Special Examination, which is for architects in practice not less than 25 years of age, and chief assistants over 30. Such candidates are exempted, by special resolution of the Council, from the Preliminary and Intermediate Examinations, and from submitting "Testimonies of Study."

Obituary.

Mr. Jacob Long, senior partner in the firm of Jacob Long & Sons, builders, of Bath, died on July 13th, aged 71. Among works carried out by the firm are the Roman Promenade and Art Gallery at Bath, under the direction of the late Mr. J. M. Bryden, and the Winsley Sanatorium (Messrs. Silcock & Reay, architects). The firm were the first to tender for all trades at Bath.

SCULPTURE AT BELFAST.

At Belfast it is now possible to compare works of sculpture by three members of the Royal Academy, says a correspondent of the *Belfast News-Letter*. The Queen Victoria Memorial, for grace and beauty of style, will compare favourably with any work that has come from Mr. Brock's chisel. Mr. Pomeroy, however, has not been so successful in this respect in the Dufferin Memorial. The introduction of a canopy has placed the artist under very serious difficulties, and the portrait statue is to a large extent robbed of its beauty by the four Ionic columns, which from many points of view obliterate it. According to the official description, the Dufferin Memorial is a composite work of the sculptor and architect, and the two sister arts seem to have vied for supremacy. Mr. Pomeroy is seen to much better advantage in the beautiful alto-relief on the tympanum of the City Hall of the leading industries of Belfast shipbuilding and linen. Mr. MacDowell is represented by his bronze figure of the Earl of Belfast in the interior of the City Hall.

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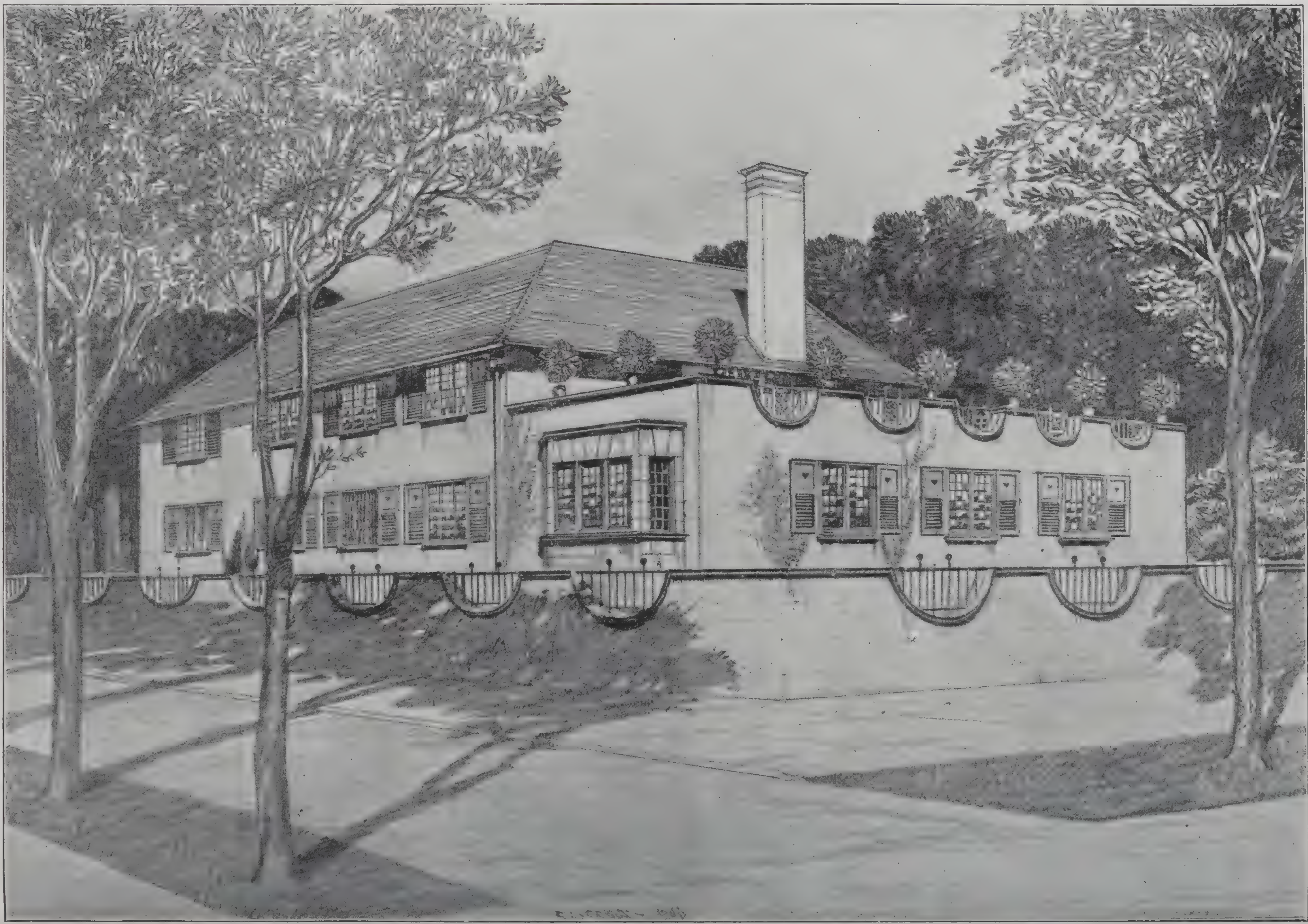
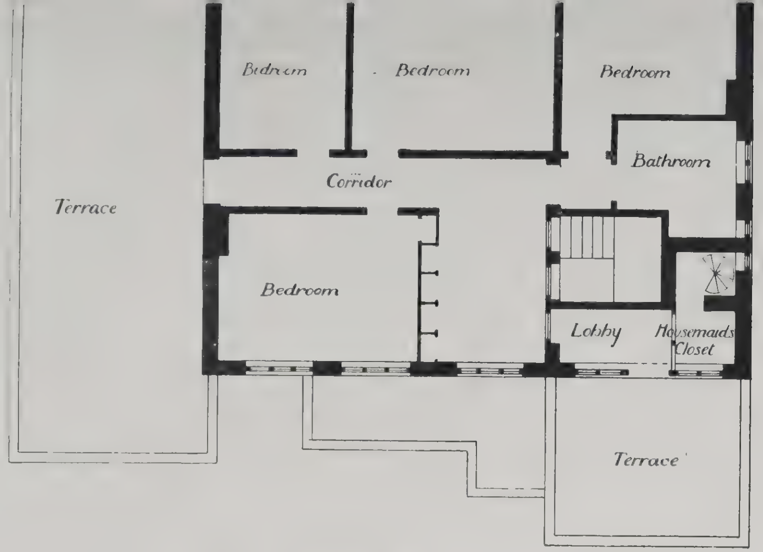
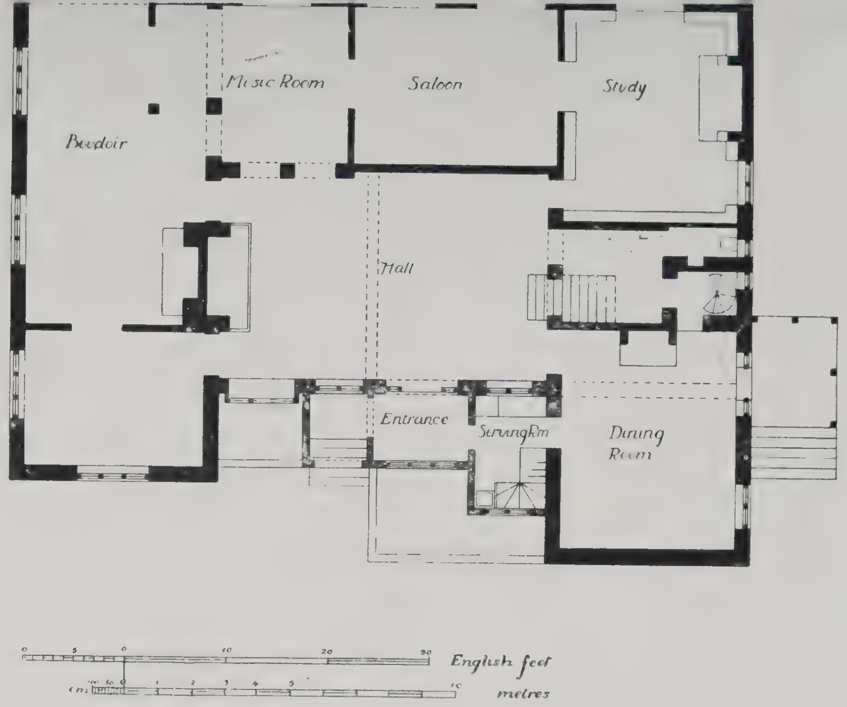
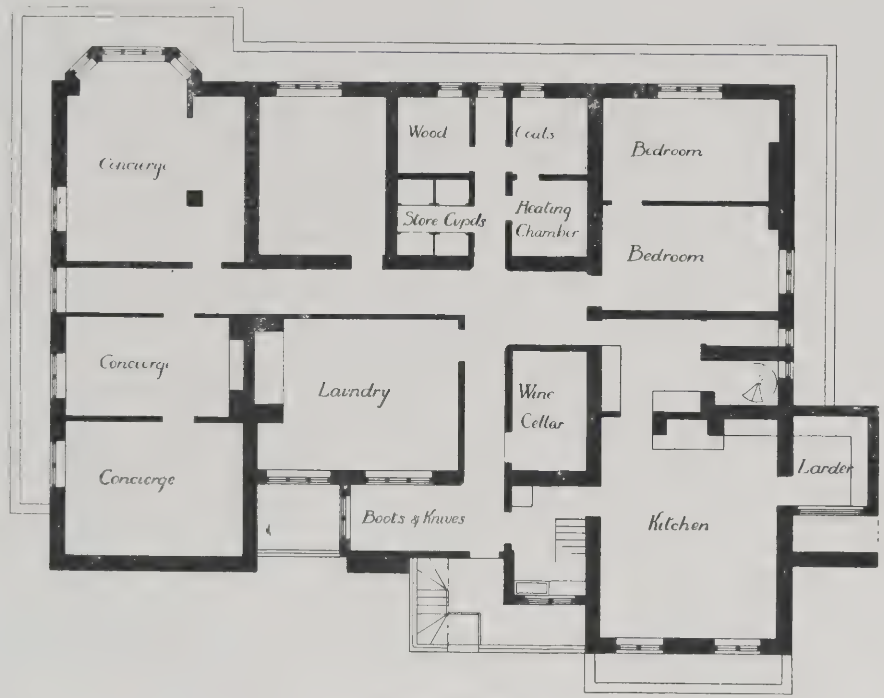




First-floor Plan.



Ground-floor Plan.



Basement Plan.

THE DE SZASZ HOUSE ON THE STEFANIA IN BUDAPEST.

C. R. ASHBEE, ARCHITECT.

This building, designed by C. R. Ashbee for Zsombor de Szasz, Esq., a Hungarian nobleman and member of the Legislature, is placed at the corner of one of the finest streets in Europe, the Stefania, having four double avenues of trees. The building is in white rough-cast, with white Szepsparillia stone, and has green shutters in rows. On the outside of the front portion is a hanging garden upon which stand rows of lemon trees. A big overhanging red-tile roof screens the hot semi-tropical sun from the bedroom windows, which are double, having inside and outside lattices in addition to the shutters, the principal problem being to keep out the sun at certain times of the day during six months of the year. A garden surrounds the house and is screened with stonework and iron railings from the main thoroughfare. The plan is in three parts as shown, the basement portion in charge of a concierge, the ground-floor with a large hall in the centre and suite of reception rooms, and the upper floor containing bedrooms only. At the end of the large fireplace in the central hall is a little statue of the Spirit of Modern Hungary carved in oak and coloured and gilded to stand against a background of white Szepsparillia stone and at present being executed by Mr. Alec Miller, the model for which was exhibited at the last Arts and Crafts Exhibition.

Enquiries Answered.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional, or legal matters.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Bending Moment on Continuous Beams.

YORK.—R. F. writes: "Please give the steps that lead up to the following formulæ in Twelvetrees—"Structural Iron and Steel," p. 119. Beam both ends fixed, loaded uniformly—

$$\text{B.M at centre} = \frac{\text{W.L}}{24}$$

$$\text{B.M at abutments} = \frac{\text{W.L}}{12}$$

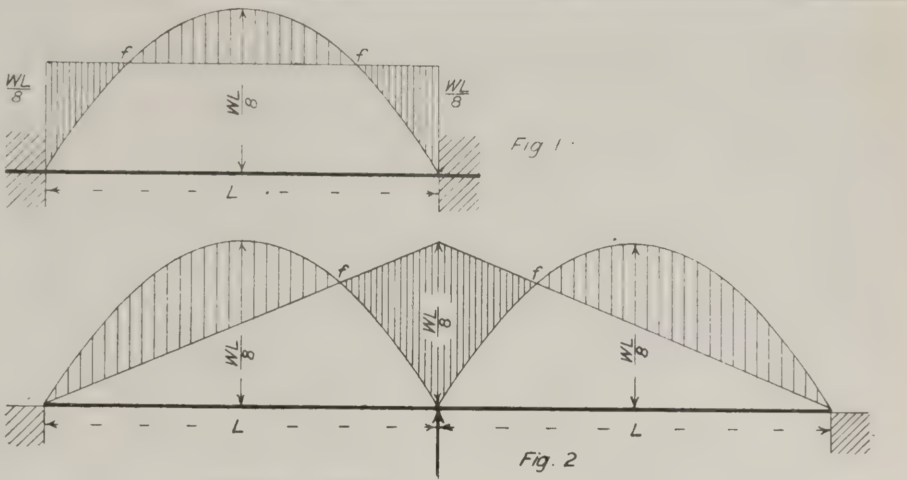
and P. 120 gives a continuous beam of two equal spans, uniform load, ends not rigidly fixed—

$$\text{B.M at abutments} = \frac{9\ \text{W.L}}{128}.\text{"}$$

The bending moments upon a beam of equal and uniform section fixed horizontally at both ends and loaded uniformly over the entire span with a load of w per foot run will be as shown in Fig. 1, where the beam, a parabola whose ordinate at centre $= \frac{wl^2}{8}$, and at ends $= \frac{wl^2}{12}$ are all apparent. The bending moment at centre is then $= wl^2\ (\frac{1}{8} - \frac{1}{12}) = \frac{wl^2}{24}$, or taking $W = wl$ the maximum bending moment $= \frac{WL}{24}$ At the supports it will be as shown above $= \frac{wl^2}{12}$ or $\frac{WL}{12}$

If the beam is continuous over two equal spans, and loaded as above, but with the outer ends free, the bending moments will be as shown in Fig. 2, where the parabola with ordinates in centre each $= \frac{wl^2}{8}$, are drawn. f will be the point of contrary flexure; the open ordinates show compression in top flange and tension in bottom, and the close ordinates show the reverse. The maximum bending moment will be over the central support $= \frac{wl^2}{8}$ or $\frac{WL}{8}$, and it will be nil at the abutments. The calculus would be required for the proof of these formulæ, for which see Rankine and other writers.

HENRY ADAMS.



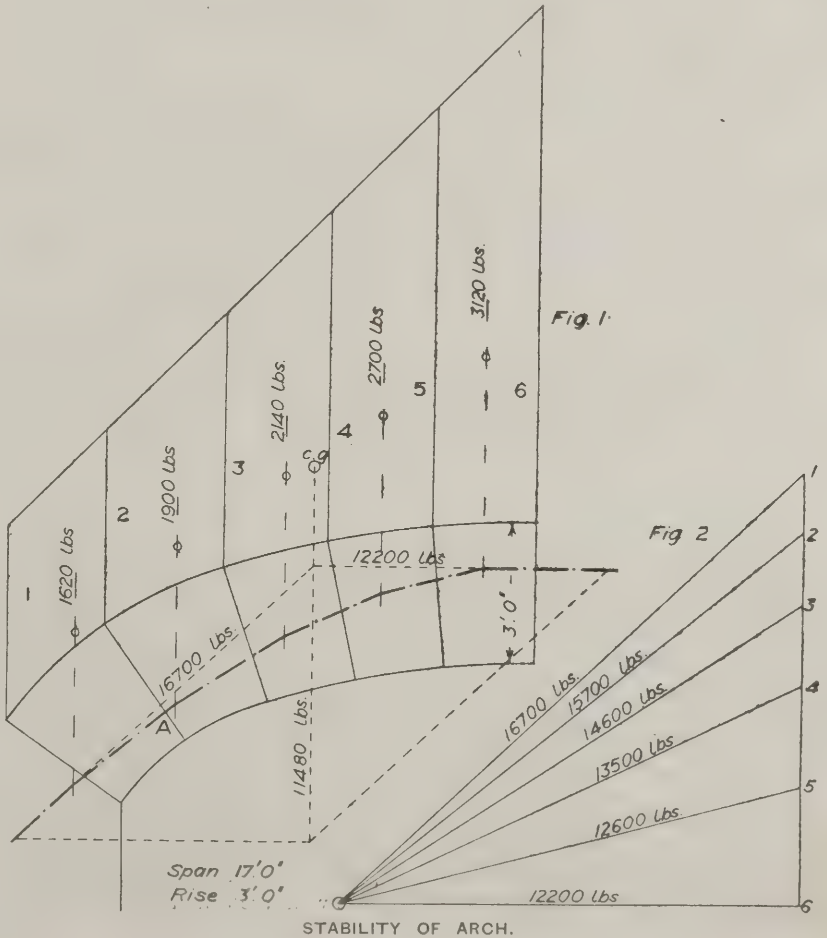
BENDING MOMENT ON CONTINUOUS BEAMS.

Stability of Arch.

BUILDER writes: "I send tracing of an arch and gable which is proposed to be built. "Do you consider this form of arch with voussoirs 3ft. high and 1ft. 6ins. through to the back capable of carrying the gable over, which is of stone walling 1ft. 2ins. thick? The height of the arch cannot be raised and the springing has to be 7ft. from the ground."

The outline of the arch with the load above is shown in Fig. 1. Divide the arch into any number of parts, and find the weight and centre of gravity of each part as shown, numbering the spaces in between. Next find the mean centre of gravity of the whole, and from the top of the middle-third at the crown draw a horizontal line to meet a vertical line through this mean centre of gravity, and from the junction of these two draw a line through the bottom of the middle-third at skewback. Set down the whole weight=11,480lbs. vertically, and by parallelogram of forces the thrust at crown=12,200lbs., and the thrust at skewback=16,700lbs., all as shown in Fig. 1. Then draw the vertical load line 1–6 in Fig. 2 and from the point 6 draw a horizontal line 6–0 equal to the thrust at the crown=12,200lbs. Join 0 to the other points on the load line, and parallel to these lines across the corresponding spaces in Fig. 1 draw the curve of thrust as shown by thick stroke-and-dot line. Then taking the joint which appears to be most liable to failure—namely, that between the first and second voussoirs marked A on Fig. 1—the pressure may be calculated by the formula $\frac{2}{3}.\frac{W}{d} = \frac{2 \times 15,700}{3 \times \frac{3}{4}} = 14,000\text{lbs.} = 6{\cdot}2$ tons per sq. ft., which is within the limits of safety.

HENRY ADAMS.



STABILITY OF ARCH.

Buildings to Measure, near Scarborough.

NEW BARNET.—X writes: "Is there any building within, say, six miles of Scarborough worth measuring for the R.I.B.A. Final examination?"

The church of St. Mary, Scarborough, will probably be the most suitable building for measuring up for the R.I.B.A. Final testimony of study. The greater portion of the church is Transitional Norman and Early English in style. In the south transept there is a decorated chapel and a fine large decorated window. At Scalby there is a good Early English church, of which the chancel is worth particular attention. There is a church at Hackness which is partly Norman and partly Early English. There is also an interesting church at Folkton in the Transitional Norman style. Scarborough Castle is worth a visit. It is a typical Norman castle, and was built by William le Gros during the reign of King Stephen. The keep was rebuilt by Henry II. While in the neighbourhood of Scarborough a visit might be arranged to Whitby, which, however, is now outside the stipulated six-mile radius. H. Y. M.

Surveyor's Right to Disapprove Plans.

BIRMINGHAM.—ARCHITECT writes: "Is a public surveyor of a district empowered to disapprove a set of plans for a number of houses which he admits comply with the by-laws? The buildings are set back to the building line several yards from the road. The surveyor requires an undertaking in writing that when called upon my client will take up the existing hedge forming the boundary to the road, and set back several feet. The surveyor admits that it may be several years before the request is made to set back the hedge. My client refuses to give the undertaking, for several reasons, and states that when the set-back is necessary, then will be the time to ask for same. The surveyor says he will disapprove the plans of the houses if the undertaking is not given. Has he the right to do so?

The surveyor cannot legally advise his Council to disapprove the plans in the circumstances you mention, unless your client is laying out a new street. It is often desirable that questions of frontage should be settled at the same time as the plans are approved, but the surveyor has no legal powers of coercion such as you describe. F.S.I.

Earliest Use of White Bricks.

HERTFORD.—E. E. S. writes: "I have been endeavouring to find out, without success, the earliest known example, in England, of the use of white bricks as ornamental work—such as quoins, buttresses—in (red) brick buildings. Perhaps you could enlighten me. Please, also, recommend a book on brickwork in which the development from early times is treated."

Your question is not quite clear. Do you mean "white glazed" bricks or what are known as "white Suffolk"? If the former, the first makers were the Leeds Fireclay Co., but we can trace no record of the first building in which the bricks were used. As a book which will serve your requirements we would recommend Dobson's "Bricks and Tiles," published by Messrs. Crosby, Lockwood & Son.

Designing Foundations.

W. G. B. writes: "In the case of a continuous wall, say, 50ft. or 60ft. long, carrying, at ground level, a load of 12 tons on each foot length, what would be a suitable design for the foundation, using (1) lime concrete and (2) cement concrete, reinforced with expanded metal in each case, and limiting the pressure on the soil to 1 ton on each square foot?"

An ordinary brick wall should not be loaded to more than 3 tons per ft. super. at base—*i.e.*, on the top course of footings. The footings should be spread by 2¼-in. set-offs on each side to a width of twice the thickness of the wall. The bottom course may be double, when resting upon the soil, but it is unnecessary when resting upon concrete of the usual width—*i.e.*, projecting 6ins. each side. When concrete is used it should be cement concrete, but lias lime concrete may be substituted in certain cases. Ordinary lime concrete is not worth more than so much plain ballast. When the width of concrete requires to be much extended owing to the poor supporting power of the soil it may be reinforced by any of the usual methods. If expanded metal is used it should be, say, 2ins. from the bottom of the concrete, the gauge of the metal being determined by the moment of resistance required for one foot run of the foundation, taken as a cantilever with a span equal to the projection and a distributed load equal to the pressure per square foot on the soil.

HENRY ADAMS.

Buildings to Measure near Portadown.

DOUGLAS.—L.C.C. writes: "Are there any churches near Portadown, in Ireland, suitable to measure for the R.I.B.A. Intermediate Examination: also, is Fountains Abbey, Yorks., suitable for this purpose?"

There is very little work of architectural interest left in the neighbourhood of Portadown. There were, at one time, many fine churches in Ireland, but the majority of these have been so thoroughly destroyed that scarcely a stone remains to indicate their former greatness. At Drumcree, a few miles north of Portadown, there is an old church and the ruins of a church remain at Taummea. Lisburn cathedral, dating from 1622, is rather interesting. Fountains Abbey is full of magnificent features suitable for measuring for the R.I.B.A. Intermediate "Testimonies of Study." H. Y. M.

A Problem in Mechanics.

BECKENHAM.—J. D. S. writes: "With reference to the solution given to "A Problem in Mechanics," on page 9 of your issue for July 4th, I should be obliged if Prof. Adams would show how the apparent discrepancies in the enclosed solution may be reconciled with his solution."

In the solution of this problem given on page 9 the tangential force of the weight was overlooked. This equals W sin 30° $= 10 \times \frac{1}{2} = 5$ lbs., so that the resistance to upward movement on the plane is $5 + 5 = 10$ lbs., leaving the amount free to act for upward movement $15 - 10 = 5$ lbs. But a weight of m lbs. = a force of mg poundals; therefore $f = 5g$ poundals. Now $a = \frac{f}{M} = \frac{5g}{10} = \frac{g}{2}$ ft. per sec. per sec. for the acceleration, and $s = \frac{at^2}{2}$, therefore $t = \sqrt{\frac{2s}{a}} = \sqrt{\frac{2 \times 4}{\frac{1}{2} \times 32}} = \sqrt{\frac{8}{16}} \quad \frac{1}{\sqrt{2}} = 0{\cdot}707$ secs. as the true answer.

HENRY ADAMS.

IN PARLIAMENT.

(By our Press Gallery Representative.)

For some time no matters of immediate interest to builders and architects were dealt with by Parliament, but a crop of questions have been addressed to Ministers in the House of Commons during the last few days.

Ventilation of Edinburgh Museum.

Mr. Weir asked the First Commissioner of Works, in view of the fact that the recently issued Report of the Committee of Council on Education in Scotland showed that the ventilation of the Royal Scottish Museum, Edinburgh, was in an unsatisfactory condition, whether he would state what steps had been taken to remedy the evil.

Mr. L. Harcourt hoped to have a scheme ready for consideration with next year's estimates.

The New War Office.

Mr. Thorne asked the First Commissioner of Works whether it was stated in the specifications for the building of the new War Office that all marble wanted for the work should be dressed and worked on the works.

Mr. L. Harcourt said the answer was in the negative. It would have been most objectionable to have stone and marble worked in the building, but the marble work, other than mantelpieces, had been prepared at the contractors' workshops in London.

Duke of York's School.

Mr. Haldane informed Major Anstruther Gray that the question of the disposal of the site of the Duke of York's School was being considered by an inter-departmental Committee.

Lunacy Commissioners' Advisory Architect.

Mr. Cooper asked the Secretary of State for the Home Department the following question: Whether he is aware that the architect appointed by the Board of Lunacy Commissioners to advise them on submitted plans for the erection or alterations of asylums is one who, in his private practice, is largely engaged in connection with such structures; whether he is in a position to give the name of the person who advises the Commissioners on the plans of asylums designed and erected under the superintendence of their architect; and whether he will consider the advisability of suggesting to the Commissioners the appointment of an architectural adviser, who shall give the whole of his time to the duties of the position?

Mr. H. Samuel, the Indian Secretary, in his reply, said he understood that the statement in the first part of the question was substantially correct. The Commissioners informed him that they found it necessary to select as their adviser an architect who from his personal experience was thoroughly conversant with the requirements of such structures. When plans of asylums designed and created under his superintendence were submitted for their approval it was open to them to employ another architect to advise them in the matter. The question of modifying the existing arrangements, either by appointing a permanent architectural adviser attached to the Commissioners' Department or otherwise, was at present under consideration.

Carnarvon Castle.

Mr. Harcourt informed Lord Balcarres that works of restoration had been going on for some years past at Carnarvon Castle. He was conferring with the Constable of the Castle, Sir John Puleston, as to the further works which might be necessary for the preservation of the fabric.

New Statue in Hyde Park.

In the House of Lords on Thursday last the Earl of Liverpool informed the Earl of Plymouth that it had been decided to erect the bronze statue representing Physical Energy, by the late Mr. G. F. Watts, R.A., at the east end of the Serpentine.

The new Carnegie Library at Walsall, just completed, has been built from designs by Mr. J. S. Gibson, F.R.I.B.A., at a cost of £8,000.

BRUCE HOUSE.

The London County Council's new lodging house, which was opened on July 13th, is the third institution of the kind erected by this authority. The first lodging house erected by the London County Council is situated in Parker Street, Drury Lane, and was opened in January 1893. The second lodging house, known as Carrington House, was opened at Deptford in November, 1903. Whereas the former only accommodates 345 men in separate cubicles, the latter has accommodation for 802 men. Bruce House is, however, an advance on both the above houses and has been erected in compliance with the scheme sanctioned by the Home Office for the re-housing of persons of the working class displaced in connection with the Holborn to the Strand improvement. Bruce House is situated in Kemble Street, off Drury Lane, and is a very similar building to the well-known Rowton Houses erected in various parts of London. It affords accommodation for 699 lodgers and 10 porters, comprising 709 cubicles in all. The building was designed by the Council's architect, Mr. W. E. Riley, F.R.I.B.A. Mr. Maurice Fitzmaurice, C.M.G., the chief engineer of the Council, was responsible for the hot water installation and the electric lighting. The contractor was Mr H. L. Holloway, of Union Works, Deptford, whose tender amounted to £46,100. The work of erection was begun shortly after the acceptance of the tender in 1904.

In clearing the area in the neighbourhood of Clare Market it became necessary to displace a public dispensary, and the Council had to reinstate this institution or pay compensation. It was decided to incorporate the dispensary building with the new lodging house, keeping it quite distinct and separate in regard to its approaches and internal arrangements. The dispensary was opened at the end of last March and consists of, on the ground floor, waiting-room, consulting-room with stripping-room adjoining, dispensing-room, committee-room, secretary's office, lavatory accommodation, stores for bottles and coals, and a yard. On the first floor are the doctor's bedroom and sitting-room; on the second floor, bathroom, and housekeeper's kitchen and scullery; and, on the third floor, housekeeper's bedroom and an additional bedroom.

As regards the lodging house, the following is a general description of the accommodation, planning, &c. :—

The site has an area of about 28,171ft. super., and has a frontage of about 220ft. to Kemble Street, 108ft. to Drury Lane, and 139ft. to Kean Street.

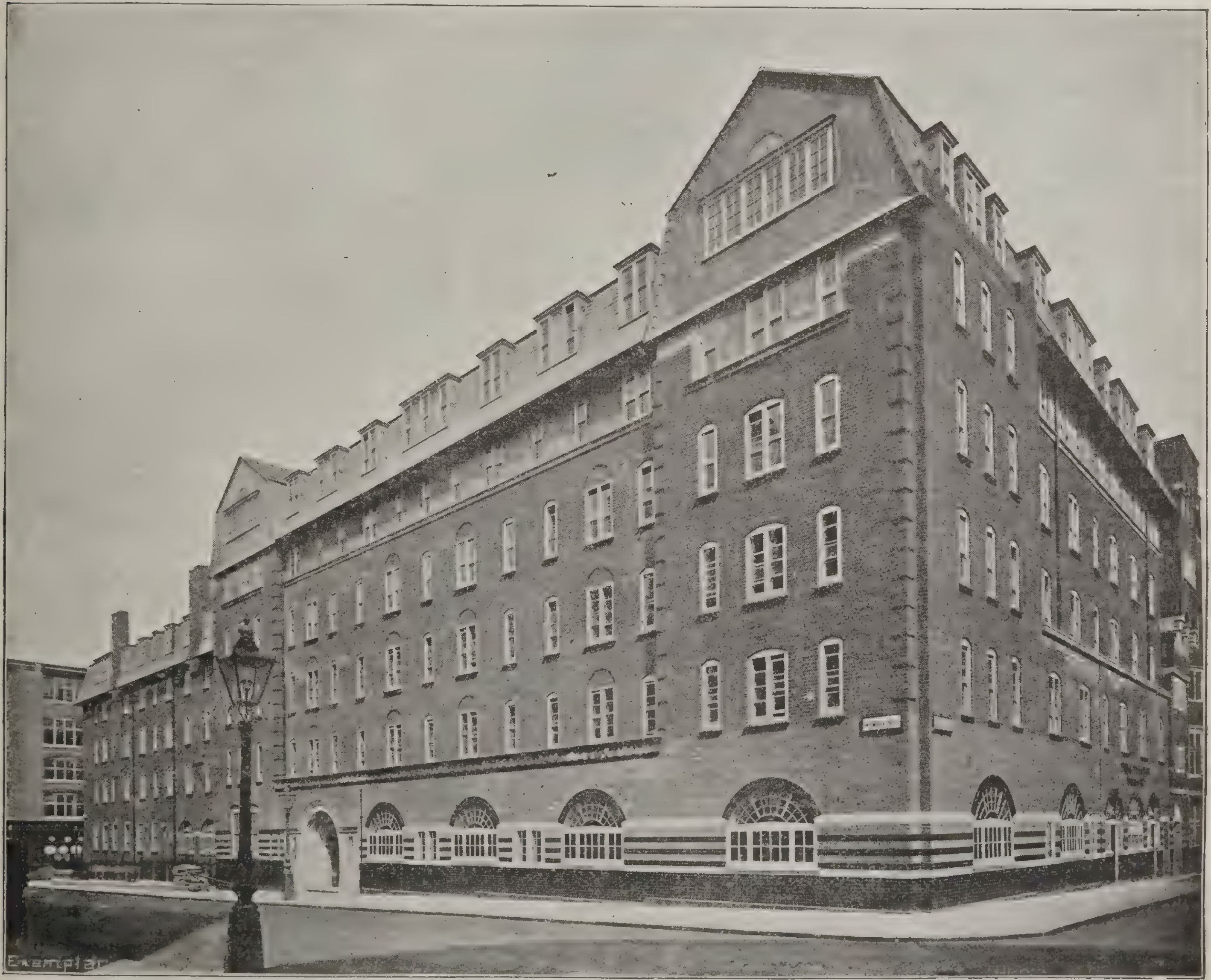
The plan of the building is E shaped above the ground floor, so arranged as to provide adequate light and air to the cubicles. The building is six storeys in height. The elevations are of red brick facings, relieved with glazed and Luton bricks, stonework and rough cast, and the roofs are covered with green slates.

The ground floor (lodgers' section) comprises spacious dining-room (including hot chamber and lodgers' crockery store), smoking-room, reading-room, writing-room, locker-room, parcels-room and w.c.'s, and urinals for the use of lodgers. The ground floor (administrative section), comprises office, superintendent's quarters, clerk's bedroom, female staff sitting-room, and bedrooms, porter's day-room and shop.

On the ground floor there is a room facing Kean Street, which it is proposed to let for commercial purposes.

The basement (lodgers' portion) comprises lavatory, feet-washing room, baths, dressing rooms, lodgers' washhouse, boot-brushing room, and barber's and boot-maker's shops. The basement (administrative portion) comprises establishment scullery, kitchen, bread and milk store, larder, crockery store, shop store, general store, bed-makers' day room, soiled linen room, clean linen room, establishment laundry (including drying chambers, one being set apart for mattresses), ironing-room, heating chambers and coal stores, and a disinfecting chamber.

The upper storeys, comprising 709 cubicles, have sanitary appliances on each floor.



BRUCE HOUSE, KEMBLE STREET, DRURY LANE, LONDON: FROM THE WEST CORNER.
W. E. RILEY, F.R.I.B.A., SUPERINTENDING ARCHITECT TO THE LONDON COUNTY COUNCIL

The surfaces of the walls in the principal corridors, staircases, lavatories, kitchens, cold stores, &c., have been finished in glazed bricks or tiles. The public rooms generally have dadoes of coloured tiles 7ft. 9in. high. The reading and writing room generally are provided with picture panels of prints, framed in teak. The smoking room has coloured pictures, similarly framed, and in the dining-room coloured tile pictures with tile frames are provided. The floors of the principal rooms are laid in wood blocks on concrete. The fireplaces to the reading and smoking rooms are designed in coloured glazed tiles, with Hopton wood stone dressings and mantel shelves. The floor and staircases throughout are of fire-resisting construction.

The charges that are made to lodgers' are 7d. per cubicle for one night only, and 6d. per night for lodgers taking weekly tickets. The payment for a bed-ticket carries with it the following privileges:—The use of the public rooms, library, daily papers, cooking utensils, crockery, etc., lavatory, feet-washing-room, lodgers' wash-house, boot-cleaning and dressing-rooms, lounge and promenade.

The catering for the lodgers' at present is being undertaken by the superintendent of the house, but the Council intend to seek authority from Parliament next session to take the catering into its own hands.

ST. MARK'S AT VENICE.

The work of restoration of the Basilica of St. Mark is proceeding with rapidity, but also with caution. The two vaults of the roof, called the Paradise and Apocalypse, which, because of their grave state, were a serious danger to the whole Basilica, are completely propped, so that they are now entirely safe, and the work is going on under the direction of Signor Manfredi, the architect, and Signor Marangoni, the engineer.

They are also personally attending to the strengthening and partial rebuilding of one of the four internal tribunes, that called the Patriarch, which has large cracks caused by the sinking of the foundations of the pillars which support it. This also was first propped, then with scrupulous care the Byzantine mosaics which adorn it were detached, as was done last year with the other Tribune of the Crucifix, which was in a similar condition. During the work on the Tribune of the Patriarch an important discovery has just been made.

In the cement which attached the mosaics to the wall a small coin of the Doge Dandolo was found, thus showing that at least part of the building of the Basilica took place in the glorious period of the Venetian Republic, between 1192 and 1205. It seems evident that the coin fell into the cement from the clothing of one of the workmen and remained there for seven centuries, as this is the first time that that mosaic has been removed since its original setting.

A new steel bridge over the Usk has been built, in the parish of Kemeys Commander, on the main road from Usk to Abergavenny, by Mr. George Palmer, of Neath, to the designs of Mr. J. J. Webster, M.Inst.C.E., of Westminster, at a cost of £7,000. Messrs. W. A. Baker & Co., Ltd., of Newport, executed the steelwork.

DANGEROUS WINCHESTER.

Further discoveries have been made of the unsatisfactory condition of the fabric of Winchester Cathedral. Immediately after one of the services last week a loud crash was heard in the building, and soon after it was discovered that the pointing of a joint in one of the ribs of the vaulted ceiling over the south aisle of the nave had fallen. The débris was composed of slate, brick, and oyster shells, which had been used as packing by the original builders. The immediate cause of the fall is believed to have been the concussion occasioned by the work of relaying the roof with lead, but examination showed that a serious weakness existed. The outer walls have been torn away from the vaulting, which has caused serious fractures in the spandrils of the roof. This points to either a settlement of the building or the thrust of the vaulting forcing the outer wall outwards. The outer wall is four inches out of the perpendicular to the height of 15ft. Temporary measures have been taken to meet the situation pending the reception of a report on the state of the south aisle by the Dean and Chapter. It is anticipated that the south wall will have to be underpinned and the whole of the pockets of the wall rebuilt. It is estimated that the cost of this work will be about £5,000. The work at the east end is progressing favourably.

Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, *Great New Street, Fetter Lane, E.C.*

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Beckenham.—For alterations and additions to Bromley Road Schools, for the Beckenham Education Committee:—

S. G. Gee, Mackenzie Road, Beckenham	£7,676	8	10
H. Heathfield, Beckenham	6,121	0	0
B. E. Nightingale, Albert Embankment	5,967	0	0
F. W. Green, Beckenham	5,893	10	0
Jones & Andrews	5,798	0	0
T. Crossley & Sons, Bromley	5,683	0	0
J. Lonsdale, Swanley Junction	5,651	0	0
F. & G. Foster, South Norwood	5,591	0	0
J. & E. Bowyer, Upper Norwood	5,555	0	0
Howky & Oldman, Mile End	5,465	0	0

Brigg.—For the erection of three dwelling-houses in Grammar School Road. Mr. W. H. Buttrick, architect, Home Street, Scunthorpe:—

F. Bilton	£1,554	11	0
C. Clark	1,377	15	0
J. Manders,* Barnetby	1,117	0	0

Architect's estimate, £1,100.

* Accepted.

Colwyn Bay.—For the erection of the new county buildings, for the Denbighshire Standing Joint Committee:—

R. J. Williams, Bangor	£11,355
R. and J. Williams, Bangor	11,355
Jones and Son, Liverpool	10,950
J. B. Jones and Son	10,200
Exors. of H. A. Clegg, Chester	10,055
W. Vernon and Sons, Chester	10,025
Brown and Backhaus, Liverpool	9,350
Davies Bros., Wrexham	8,970
R. Allen, Widnes	8,810
E. Jones and Sons, Groeslon	8,800
Buller Bros., Liverpool	8,748
J. T. Jones, Cefn	8,697
Holme and Green, Liverpool	8,595
R. Jones	8,022
Davies and Jones	7,980
R. L. Roberts, Llandudno	7,970
R. Evans and Son, Old Colwyn	7,909
Wood and Co.	7,685
J. Myers and Son, Chester	7,498
E. Thorp and Sons, Llandudnc	7,495
A. Emmett	7,400
H. Kelly and Co., Liverpool	7,297
Jones and Pritchard,* Abergele	5,900

*Accepted. [Rest of Colwyn Bay.]

Coventry.—For the erection of motor manufactory and office on the west side of Foleshill Road. Mr. F. Foster, architect, Masonic Buildings, Coventry. Quantities by the architect:—

B. W. Whitehouse & Son	£12,947	0	0
J. Worwood	12,845	0	0
Kelley & Son	12,355	3	0
C. Haywood	12,250	0	0
C. Griffiths	12,239	0	0
J. Parnell & Son	12,227	0	0
J. Isaacs & Sons	12,004	0	0
C. G. Hill	11,990	0	0
Orr Bros.	11,772	0	0
C. Garlick	11,690	0	0
R. & A. R. Cleaver	11,550	0	0
A. A. Wincott	11,526	0	0
W. H. Gibbs	11,475	0	0
E. Harris,* Coventry	11,450	0	0
W. Hopkins	11,300	0	0

* Accepted.

Cowes (I.W.)—For the reconstruction of shop, offices, and stores in Mill Hill Road, for Messrs. Henry Bannister and Co., rope manufacturers. Mr. J. W. Bessant, architect and surveyor, Pelham Road, Cowes, Isle of Wight:—

W. Barton & Co.	£1,087	10	0
H. E. Day	1,057	0	0
J. Meader	982	0	0
G. W. Ball,* Cowes	946	0	0

Architect's estimate, £901.

* Accepted.

Devonport.—For alterations and additions to 40 and 41, Fore Street (business premises), for Mr. F. Goodman. Mr. Edgar M. Leest, architect, 14, St. Aubyn Street, Devonport. Quantities by Messrs. Leest & Adams, Devonport:—

Wakeham, Bros.	£2,494
J. H. Palmer	2,390
T. May & Son	2,355
Pearce Bros.	2,297
A. N. Coles	2,297
Jenkin & Son	2,295
Pearn Bros.	2,254
H. J. Allen	2,024
S. Roberts,* Plymouth	1,950

* Accepted.

Eccles.—Accepted for the erection of the Carnegie Library, for the Corporation. Messrs. Potts, Sons, & Hennings, architects, Manchester:—

Hardman & Jones, Eccles £7,200

Headingly (near Leeds).—Accepted for the construction of new filter-beds, for the Leeds Waterworks Committee:—

C. Bushby & Sons, Darlington ... £31,705 4 10

Highley.—Accepted for additions to Council school, for Salop Education Committee. Messrs. Gething & Son, architects, Oxford Chambers, Kidderminster:—

C. Griffiths. Stourbridge £1,070

Hindhead (Surrey).—For the erection of new Council schools. Messrs. Jarvis & Richards, architects, 36, Victoria Street, S.W.

J. & M. Patrick	£3,183	0	0
J. B. Potter	2,540	0	0
Drowley & Co,	2,499	0	0
R. Wood	2,469	0	0
J. J, Pink	2,430	0	0
J. Milton	2,410	0	0
Crosby & Co.	2,383	0	0
G. Mardon	2,347	0	0
Goddard & Sons	2,338	0	0
Chapman & Lowry	2,330	0	0
Haslemere Builders	2,317	0	0
G. Kemp	2,298	0	0
T. J. Hawkins & Co.	2,284	11	8
Tompsett & Co,	2,281	0	0
Mitchell Brothers	2,260	0	0
Martin, Wells & Co.	2,155	0	0
G. Chute*	2,135	12	2

*Accepted.

Littlehampton.—For the construction of a steel bridge over the river Arun, to consist of a swing span and a fixed span, also for the construction of the approaches and abutments, for the Littlehampton U.D.C.

	Bridge.			Approaches.		
Fasey & Sons	£12,880	0	0	£2,474	10	1
Handysides	12,279	9	6	2,607	0	8
Ditto (alternative)	12,047	11	7	—		
A. Thorne,* Westminster	10,645	0	0	2,343	14	4
Pedrette & Co.	—			3,385	1	6
F. Bevis	—			3,283	11	0
A. E. Nunn	—			3,030	9	3
Underwood Bros.	—			2,897	4	5
J. Dickson	—			2,889	12	0

*Accepted.

London, N.W.—For the erection of extension to new hospital at Haverstock Hill, for the committee of the Hampstead General Hospital. Messrs. Young & Hall, architects, 17, Southampton Street, Bloomsbury, W.C.:—

W. Willett, Sloane Square	£12,531
Gough & Co., Hendon	12,444
Perry & Co., Bow	12,359
Patman & Fotheringham, Theobald's Road, W.C.	12,210
Godson & Sons, Kilburn	12,111
Johnson & Co., Wandsworth Common	11,730
Holliday & Greenwood, Brixton	11,640
Spencer, Santo, & Co., Kensington	11,610
Kirk & Randall, Woolwich	11,516
J. Allen & Sons, Kilburn	11,435
McCormick & Sons, Essex Road, N.	11,392
Davey Limited, Southend-on-Sea	11,387
B. E. Nightingale, Albert Embankment	11,188
J. Barker & Co., Kensington, W.	11,014
W. Laurence & Sons, Waltham Cross	10,998
G. E. Wallis & Sons,* Broadmead Works, Maidstone	10,949

* Accepted.

London.—For the erection of the second portion of the car-shed at Streatham required in connection with the electrical working of portions of the London County Council's southern tramways:—

F. & F. H. Higgs, London	£7,880	0	0
A. M. Coles, Plymouth	7,757	19	8
Martin, Wells & Co., Ltd., Aldershot	7,699	0	0
T. G. Sharpington, London	7,658	0	0
H. Lovatt, Ltd., London	7,600	0	0
Holliday & Greenwood, Ltd., London	7,393	0	0
Kirk & Randall, London	7,234	0	0
Chas. Wall, Ltd., London	7,220	0	0
F. & T. Thorne, London	7,169	0	0
J. & C. Bowyer,* London	7,145	0	0
Perry & Co.†	5,489	0	0

Architect's estimate, £6,900.

* Recommended for acceptance.

† Withdrawn owing to clerical errors.

London.—For the reconstruction of Lee and Lee Green Bridges in connection with the construction of the authorised tramways from High Street, Lewisham, *viâ* Lee High Road, to Lee Green, for the London County Council:—

A. Thorne, London	£4,279	4	6
The Tilbury Contracting and Dredging Company (1906) Ltd., London	3,542	18	4
G. Hay & Co., London	3,334	19	0
Butterley Co., Ltd., Derby	3,208	10	4
A. Fasey & Son, Leytonstone	3,008	7	9
Kirk & Randall, London	2,981	15	8
W. Muirhead & Co., London	2,899	18	6
Greig & Matthews,* London	2,869	9	9

Chief Engineer's estimate, £3,595 11 3.

* Recommended for acceptance.

London, S.W.—For the erection of a permanent school consisting of three one-storey buildings to accommodate 804 children upon a site in Franciscan Road, Wandsworth, for the London County Council:—

	Original estimate.			Estimate on items in amended specification		
J. Guttridge, Park Rd., Peterboro'	£21,851	2	10	20,954	17	5
B. E. Nightingale, Albert Embankment, Lambeth	20,200	0	0	19,487	14	7
J. Appleby & Sons, Cornwall Works, Lambeth	20,407	0	0	19,287	0	0
W. Johnson & Co., Limited, Wandsworth Common	20,101	0	0	19,089	17	6
Wisdom Brothers, South Street, Isleworth	19,899	10	0	19,081	6	9
E. Triggs, 92, The Chase, Clapham	19,900	0	0	18,961	18	11
J. & C. Bowyer, Westow Street, Upper Norwood	19,779	0	0	18,929	0	3
G. E. Wallis & Sons, Limited, Broadmead Works, M'dstone	19,548	0	0	18,680	4	6
J. Garrett & Son, 17, Balham Hill	19,471	0	0	18,537	5	0
J. & M. Patrick,* Wandsworth	19,387	0	0	18,516	18	6
D. W. Davies, Morgan Chambers, St. Mary Street, Cardiff	19,425	8	5	18,370	9	6

* The amended specification was drawn-up with a view to reducing the cost, and adopting some of the items, Messrs. Patrick's estimate amounts to £18,537, and is recommended for acceptance at this figure.

London.—For the erection of a permanent school, consisting of a three-storey building, providing accommodation for 836 children (viz.—Boys, 266; girls, 266; infants, 304), in Lawn Lane, Kennington, for the London County Council:—

	Original estimate.			Estimate on items in amended specification.		
J. Appleby & Sons, Stamford Street	£20,088	0	0	18,576	0	0
Martin, Wells & Co., Ltd., 25, Auckland Street, Vauxhall	19,514	0	0	18,533	2	11
Treasure & Son, Cottenham Road, Holloway	19,182	0	0	17,839	0	0
W. Johnson & Co., Ltd., Wandsworth Common	19,140	0	0	17,977	15	0
A. F. Vigor & Co., 10, Grosvenor Road	19,002	0	0	18,101	0	0
J. Grover & Son, Wilton Works, New North Road	18,972	0	0	17,851	0	0
J. & M. Patrick, Point Pleasant, Wandsworth	18,955	0	0	17,502	0	0
E. Triggs, 92, The Chase, Clapham	18,864	0	0	17,632	0	0
D. W. Davies, St. Mary's Street, Cardiff	18,675	14	10	17,116	18	8
J. & C. Bowyer, Westow Street, Upper Norwood	18,623	0	0	17,456	18	0
J. Guttridge, Park Road, Peterboro'	18,616	17	7	17,464	8	4
G.E. Wallis & Sons, Ltd., Broadmead Works, Maidstone	18,518	0	0	17 303	10	0
E. Lawrence & Sons, 14, Wharf Road, City Road	£18,433	0	0	£17,172	0	0
B. E. Nightingale, Albert Embankment	18,384	0	0	17,154	4	10
Higgs & Hill, Ltd., Crown Works, South Lambeth Road	18,224	0	0	17,320	0	0
J. Garrett & Son,* 83, Balham Hill	17,852	0	0	16,757	0	0

* The amended specification was drawn up with a view to reducing the cost, and adopting some of the items, Messrs. Garrett & Son's estimate amounts to £17,044, and is recommended for acceptance at this figure.

London, S.W.—For the erection of a school on a plot of land in Garratt Lane, known as the Fountain Road site, Wandsworth, for the London County Council, consisting of a two-storey building for the accommodation of 275 boys and 275 girls; and a separate one-storey building for 290 infants.

	Original estimate.			Estimate on amended specification.
	£	s.	d.	£
Holliday & Greenwood, Ltd., Brixton	—			20,870
Martin, Wells & Co., Ltd., 25, Auckland Street, Vauxhall	19,664	15	10	20,567
Spencer, Santo & Co., Ltd., Earl Street, Westminster	19,551	0	0	20,782
J. Appleby & Sons, Cornwall Works, Stamford Street	19,479	0	0	21,114
Patman & Fotheringham, Ltd., 100, Theobald's Road	19,390	0	0	20,673
W. Lawrence & Son, Canal Works, Waltham Cross	19,102	4	0	20,316
J. Chessum & Sons, Crown Wharf, Monier Road, Bow	19,078	17	3	20,499
E. Lawrance & Sons, 14, Wharf Road, City Road	19,072	0	0	20,365
J. Barker & Co., Ltd., Kensington	19,015	0	0	20,360
T. J. Hawkins & Co., 109, Victoria Street	18,939	14	0	19,869
J. & C. Bowyer, Westow Street, Upper Norwood	18,654	6	1	19,677
E. Triggs, 92, The Chase, Clapham	18,573	15	5	19,785
G. E. Wallis & Sons, Ltd., Broadmead Works, Maidstone	18,522	0	0	19,570
J. Garrett & Son, 83, Balham Hill	18,477	0	0	19,642
W. Johnson & Co., Ltd., Wandsworth Common	18,438	17	0	19,768
B. E. Nightingale, Albert Embankment	18,289	0	0	19,812
A. F. Vigor & Co.,* Page Street, Westminster	18,360	0	0	19,644

*The amended specification was drawn up with a view to reducing the cost, and adopting some of the items, Messrs. Vigor & Co.'s estimate amounts to £18,135, and is recommended for acceptance at this figure.

London.—For improvements to Dempsey Street School, for the London County Council:—

F. & F. J. Wood, 64, Cleveland Street, E.	£14,193	0	0
Todd & Newman, Hackney	12,546	0	0
W. Gregar, Jupp Road, Stratford, E.	12,420	0	0
W. Cubitt & Co., 258 Gray's Inn Road, W.C.	12,071	0	0
J. Parsons, 190 & 192 Waterloo Road, S.E.	11,729	7	6
A. E. Symes, Stratford, E.	11,395	0	0
Killby & Gayford, 87 Worship Street	11,381	0	0
Patman & Fotheringham, Ltd., Park Street, Islington, N.	11,373	0	0
Perry & Co., Tredegar Works, Bow, E.	11,321	0	0
H. Lovatt, Ltd., Darlington Street, Wolverhampton	11,277	6	2
E. Lawrence & Sons, 14 to 16 Wharf Road, City Road, N.	11,174	0	0
W. H. Lascelles & Co., Ltd.	11,098	0	0
J. Grover & Son, Wilton Works, New North Road, Islington, N.	11,073	0	0
J. & M. Patrick, Wandsworth, S.W.	10,802	0	0
J. Chessum & Sons, Bow	10,794	0	0
Treasure & Son, Cottenham Road, Upper Holloway, N.	10,539	0	0
W. & B. H. Davey,* Ruskin Lodge, Victoria Avenue, Southend-on-Sea	10,196	18	6

[Estimate of the Architect (Education), £11,348.]

* Recommended for Acceptance.

London.—For the enlargement of Paddington District Post Office, for H.M. Office of Works, &c.:—

		Cr.
E. J. Clayton	£56,760	£450
J. Simpson & Son	38,985	—
Foster & Dicksee	38,909	206
C. Ansell	38,906	400
J. & W. Drake	37,107	199
Aldin Bros. & Devies	37,000	100
Speechley & Smith	36,900	250
Edwards & Medway	36,800	150
J. Barker & Co.	36,052	250
J. Smith & Sons	35,983	515
B. E. Nightingale	35,770	100
Spencer, Santo, & Co.	£35,466	£150
E. Lawrence & Son	35,274	250
W. Taylor & Co,	35,147	250
W. H. Lorden & Son	35,000	168
Vigor & Co.	34,970	300
W. Johnson & Co.	34,783	120
Perry Bros.	34,777	170
C. Wall, Ltd.	34,697	175
H. M. Patrick	34,439	100
W. King & Son	34,248	207
J. Garrett & Son	34,183	80
Martin, Wells & Co.	34,069	—
Killby & Gayford	34,050	193
J. Mowlem & Co.	33,970	—
H. J. Williams, Ltd.	32,520	30
J. Chessum & Sons	32,439	139
Galbraith Bros.	31,947	394
Wisdom Bros.	31,485	105
A. Fairhead & Son	31,000	200
J. Allen & Sons *	29,990	315

* Accepted.

Chelsea.—For removing three iron buildings, offices, &c., from the Timbercroft Road site, Woolwich, and re-erecting them on the Hortensia Road site, Chelsea, for the London County Council:—

W. Bain & Co., 122, Cannon Street	£1,885
A. Leather, Riverbank Works, Wandsworth	1,654
T. J. Hawkins & Co., 109, Victoria Street	1,580
W. Harbrow,* Iron Building Works, South Bermondsey	1,440

* Recommended for acceptance.

Marley.—For the erection of a house at Marley, Haslemere. Mr. John H, Howard, architect, The Cottage, Lower Street, Haslemere:—

F. Milton	£1,392
R. Smith	1,350
Chapman & Lowry	1,300
D. Fry	1,198
Haslemere Builders Limited*	1,185

* Accepted.

Nottingham.—For alterations and additions to Albany Works, Carlton Road, Nottingham, for Wright's Finishing Co., Ltd. Mr. Harry H. Goodall, architect, Nottingham:—

W. Appleby	£330
T. Cuthbert	325
J. Hutchinson & Son	322
W. Maule	315
F. M. Thompson & Sons	305
T. H. Harper*	300

* Accepted.

South Shields.—Accepted for extensions to *Gazette* Printing Works, for Northern Press and Engineering Co. Messrs. T. A. Page & Son, architects, Waterloo Chambers, 67, King Street, South Shields:—

J. Young	£2,368

Southwell.—For additions to the Gas Works, Southwell, for the Southwell District Gas Co., Ltd. Mr. Harry H. Goodall, architect, Nottingham:—

J. Pogson (Farnsfield)	£454	16	0
W. Cottam (Southwell)	440	0	0
T. Fish & Sons (Nottingham)	437	0	0
T. H. Harper* (Carlton)	354	0	0

* Accepted.

Warwick.—Accepted for the construction of new underground reservoir and engine-house, for the Town Council:—

E. Talliss, Warwick	£5,797

Wellington (Salop).—For the erection of a Sunday-school at Tan Bank, for the Primitive Methodist trustees. Mr. Elijah Jones, M.S.A., architect, 10, Albion Street, Hanley, Staffs:—

	Building.			Plastering.		
T. Challoner, Shrewsbury	£2,026	18	9	99	7	4
T. Godwin, Hanley	1,641	0	0	65	16	0
J. C. Holder, Wolverhampton	1,590	0	0	86	12	0
F. L. Jones, Wolverhampton	1,578	0	0	74	0	0
A. Pearce	1,569	0	0	57	10	0
J. Carver	1,559	0	0	56	0	0
A. Roper	1,478	0	0	55	0	0
W. Skelhorne, Stafford	1,448	0	0	43	5	10
J. Blakemore & Son, Oakengates	1,389	0	0	56	14	6
J. Bright	1,373	0	0	54	17	0
A. Holmes*	1,355	0	0	50	0	0

* Accepted. [Rest of Wellington.]

Winterbourne.—For the restoration of St. Martin's Church. Mr. C. E. Ponting, F.S.A., diocesan architect, Marlborough:—

Merrick & Son, Glastonbury	£1,157	0	0
C. H. Green, Blandford	1,052	0	0
R. Norman	988	0	0
R. Davis & Son, Dorchester	865	19	9
W. J. Childs, Yeovil	861	10	0
H. Hoskings	830	0	0
C. H. Kite, Taunton	798	0	0
W. J. Cooper,* Bridpot	751	1	6

* Accepted.

Wraysbury.—For the erection new infants' school for about 100 children, and minor alterations to existing school, for the Bucks County Education Committee:—

	New School.	Repairs.			Gravelling.		
G. Gray	£1,690	£110	0	0	£35	0	0
A. Francis	1,688	159	0	0	—		
Richardson	1,632	98	10	0	45	0	0
Hollis & Sons	1,619	98	0	0	33	0	0
Burfoot & Son	1,589	104	0	0	38	0	0
Lock Bros.	1,570	108	19	0	—		
E. T. Lovell	1,550	46	10	0	35	0	0
H. Hendry	1,490	88	0	0	26	0	0
H. D. Bowyer	1,495	92	6	0	52	10	0
C. W. Cox & Sons*	1,485	92	0	0	25	15	0

* Accepted.

Complete List of Contracts Open.

WITH a few exceptions, news of Contracts Open are not repeated after they have been published once in these columns, so that readers will find particulars in our previous issues of other contracts that still remain open.

Unless expressly stated to the contrary, all deposits required for bills of quantities, &c., are returned on receipt of *bona-fide* tenders

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair-wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

Aug. 2. Alnwick.—*Erection of new residence* at Alnwick for Wm. Percy, Esq. The plans and specifications may be seen of G. Reavell, Junr., Alnwick, and the tenders, duly endorsed, must reach him not later than noon, August 2.

Aug. 2. Ecclesfield.—*Execution of repairs and improvements at the Ecclesfield Town, Burn Cross, and High Green Provided Schools.* Specification may be obtained on application to W. Hague, Divisional Clerk, Education Office, Ecclesfield. Tenders should reach the Divisional Clerk not later than noon on August 2.

August 2. London, N.W.—*Erection of Stationmaster's house* at West Hampstead for the Midland Railway Co. Plans and specifications may be seen, quantities and particulars obtained on application at the Engineer's Office, Derby Station. Sealed tenders to be forwarded by post to the Secretary of the Ways and Works Committee, Midland Railway, Derby, not later than 9 a.m. on August 2.

August 3. Ton Mawr.—*Erection of stables at the Railway Inn*, Ton Mawr, near Pontrhydyfen. Plans and specifications can be seen at the Railway Inn or of T. Roderick, architect, Ashbrooke House, Aberdare. where bills of quantities can be obtained. Endorsed tenders to be sent in to the architect not later than August 3.

August 3. Withernwick. — *Additions and alterations to the offices, etc.*, at the Council School, Withernwick. Persons desirous of tendering for the work may see the drawings, specification, and obtain forms of tender on application to the Building Surveyor, County Hall, Beverley, or at the Council School during the usual hours. Tenders, endorsed "Withernwick School," to be forwarded not later than August 3 to J. Bickersteth, clerk to the East Riding Education Authority, County Hall, Beverley.

August 4. Hayle.—*Stable buildings, &c.*, at Hallankean, Hale, in the occupation of J. H. Richards, where the plans and specifications may be seen. Tenders to be sent to S. Lawrey, Helnoweth Gulval, August 4.

August 4. Roseudian. — *Cattle house at Roseudian*, in the parish of St. Hilary, in the occupation of Mr. Benjamin Hocking and the executors of Mr. William Hocking. Plans, conditions and specifications, which are now at the farmhouse at Roseudian, can be inspected; tenders should be sent, on or before August 4, to G. Gow, Tregothnan Office, Truro.

August 4. Breage.—*Erection of farm buildings* at Rinsey Farm, in the parish of Breage, in the occupation of Mr. Thomas Buckett; also for the erection of a slaughter-house on the tenement at Rinsey occupied by Mr. John Oliver. The plans and specifications are at the farmhouse at Rinsey occupied by Mr. Buckett, where they can be inspected. Tenders should be sent to C. Staples, 12, Tolver Road, Penzance, on or before August 4.

August 4. Wakefield.—*Works in connection with alterations to Wales Kiveton Park Provided School.* Plans may be seen and quantities obtained on application to J. Vickers-Edwards, county architect. A deposit of £1 is required. Cheques to be sent to the West Riding Treasurer, County Hall, Wakefield. Sealed tenders, properly endorsed, to be sent to J. Vickers-Edwards, county architect, County Hall, Wakefield, not later than 10.30 on the morning of August 4.

August 4. Cardiff.—1. *Erection and completion of porches, folding partitions, &c.*, at Cowbridge Council School; 2. *Alterations* to the Beddau Council School near Llantrisant, Plans may be seen and specification and form of tender obtained for work No. 1 at the Cowbridge Police Station, for work No. 2 at the Llantrisant Police Station, and for both works of T. M. Franklen, Glamorgan County Offices, Westgate Street, Cardiff. Tenders, made out on the forms supplied, are to be delivered to T. M. Franklen not later than August 4, marked outside "Tender for Cowbridge" or for "Beddau School" as the case may be. Fair wages clause.

August 6. Dumfries.—*Pavilions at the Crichton Royal Institution, Dumfries.* Plans and specifications, &c., can be seen at the Crichton Royal Institution, Dumfries. Tenders must be lodged with S. Mitchell & Wilson, 13, Young Street, Edinburgh, on or before August 6.

August 6. Riverside, Radstock. — *Re-construction of existing buildings as business premises*, comprising a draper's shop, furniture store, &c., at Riverside, Radstock, for the Radstock Co-operative Society, Ltd. Plans and specification may be seen by appointment with W. F. Bird, architect, Midsomer Norton, and bills of quantities and form of tender will be forwarded in order of application. Sealed tenders, endorsed "Proposed Premises, Riverside," are to be delivered to the secretary of the society on or before August 6.

August 7. Cradley—*Erection of a corrugated iron goods shed, offices, &c.*, on the Spinners End Goods Branch, Cradley, for the Directors of the Great Western Railway Company. Plans and specification may be seen and forms of tender and bills of quantities obtained at the office of the Engineer at Wolverhampton Station, between the hours of 10 a.m. and 4 p.m. Tenders addressed to G. K. Mills, Secretary, Paddington Station, London, W., and marked outside "Tender for Goods Shed, etc., Cradley," will be received on or before August 7.

Aug. 8. Elham.—*Alterations and repairs at the Sanatorium, Each End Hill, Lyminge*, for the Rural District Council. A specification of the work required to be done can be seen at the office of H. Ames, Surveyor, Elham. Tenders, sealed and endorsed, must be delivered to R. Lonergan, clerk to the Council, 11, Cheriton Place, Folkestone, not later than 12 noon, on August 8.

Aug. 8. Londonderry.—*Alter, repair, and make additions to the Coleraine Courthouse.* Not to exceed £2,886. Plans and specifications may be seen at County Surveyor's Office, County Courthouse. Full particulars and conditions of tendering and forms of tender may be had from T. B. Adams, secretary to the County Council, County Courthouse, Londonderry. Tenders must be delivered to the Secretary on or before 4 o'clock p.m. on Aug. 8.

August 8. Bishopwearmouth.—*Proposed additions and alterations to the South East Lodge*, Bishopwearmouth Cemetery. Drawings and conditions of contract may be seen and bills of quantities and form of tender obtained at the Borough Engineer's Office, Town Hall, Sunderland. Sealed tenders, addressed to the Chairman of the Bishopwearmouth Burial Board, and endorsed "Tender for additions and alterations to Lodge, Bishopwearmouth Cemetery," must be delivered to F. M. Bowey, Town Hall, Sunderland, before 12 o'clock noon on August 8.

August 8. Barry (Glam).—*Erection of public offices* in Holton Road, Barry, in accordance with designs prepared by Messrs. Hutchinson and Payne, architects, 29 John Street, London, W.C. Plans and specifications may be seen, and forms of tender and bills of quantities obtained, at the offices of the architects or of the Surveyor to the Council, 160, Holton Road, Barry, on payment of a deposit of £5. A copy of the contract to be entered into may also be seen at the Surveyor's office. Sealed tenders. endorsed "Public Offices," to be delivered to T. B. Tordoff, clerk, Council Offices, Barry, by August 8,

August 11. Seaford, Sussex—*Boarding house proposed to be built at Seaford*, for the Seaford West Co., Ltd. Names of intending contractors to be submitted to W. Lambe, Estate Office Claremont Road, Seaford, from whom schedules of quantities may be obtained in due course on a deposit of £3 3s., sent to the above address, sealed and endorsed "Tender for Boarding-house," not later than August 11.

August 11. Camborne.—*Erection and completion of the proposed residence at Basset Road, Camborne*, for John Whilworth, Esq., according to plans and specification, which may be seen by appointment at the offices of S. Hill, architect, Green Lane, Redruth, from whom all particulars relating to the work may be obtained. Sealed endorsed tenders are to be sent to the proprietor, Lloyd's Bank, Camborne, on or before August 11.

August 11. Braemar.—*Executing the mason, carpenter, smith, slater, plumber, plasterer, glazier and painter works, electric light wiring and fittings, electric bells and window blinds, of proposed rebuilding of the west wing of the Fife Arms Hotel, Braemar.* The plans and conditions of contract may be seen with, and schedules of quantities obtained from Kelly & Nicol, architects, 367, Union Street, Aberdeen. Sealed tenders are to be lodged with W. Macintosh, Fife Estate Office, Banff, on or before August 11.

August 15. Lostock Hall, near Preston.—*Erection of a new Public Elementary School* at Lostock Hall, near Preston. The plans may be seen and bills of quantities obtained at the office of Henry Littler, county architect, 16, Ribblesdale Place, Preston, by payment of a deposit of £2. Tenders must be delivered before 12 o'clock noon on August 15, 1906, sealed and endorsed, to W. S. Woodcock, Council Offices, Bamber Bridge, near Preston.

August 16. Antwerp.—*Reconstruction of the Government Bonded Warehouses*, known as the "Nord-Ancien and Nord-Nouveau." The specification ("*Cahier des charges*," No 1,144), relating to the contract may be obtained from the Hôtel de Ville, Antwerp, at a cost of 2 francs. All tenders should be sent in sealed registered envelopes, addressed "A Monsieur le Bourgmestre en l'Hôtel de Ville d'Anvers," and should reach the Hôtel de Ville not later than August 16. A deposit of £1,000 is required to qualify any tender. A copy of the specification may be seen at the offices of the Commercial Intelligence Branch of the Board of Trade, 73 Basinghall Street, London, E.C.

Aug. 17. St. Austell.—*Erecting new secondary schools* at St. Austell, according to plans and specifications prepared by B. C. Andrew, architect to the committee, Biddick's Court, St. Austell, at whose office the plans may be seen, and all information obtained. Sealed endorsed tenders to be sent to F. R. Pascoe, secretary, Education Office, Truro, on or before August 17.

August 21. Sheffield.—*Underground conveniences adjoining the town hall in Surrey Street* for the Health Committee. Specification and plans may be seen and quantities obtained at the office of C. F. Wike, C.E., city surveyor, Town Hall, Sheffield, on payment of £1 1s. Tenders, endorsed "Town Hall Conveniences," are to be sent in not later than 6 p.m. on August 21, addressed to "The Chairman and Members of the Health Committee, City Surveyor's office, Town Hall, Sheffield." A fair wages clause.

Sept. 5. Manchester.—*Alterations and additions to the Abbott Street Municipal School, Rochdale Road, Manchester.* Plans may be seen and a copy of the bill of quantities (including specification) may be obtained at the Education Offices, Deansgate, Manchester, on a deposit of £2 2s. Tenders, on the official forms and enclosed in the envelopes provided, must be delivered not later than Sept. 5. Cheques to be made payable to the Accountant, Education Offices, Deansgate, Manchester.

No date. Tarrington.—*Erection of a parish room*, corrugated iron on brick foundation, at Tarrington. Plans and specifications can be had from the Rector, Tarrington.

No date. Royston.—*Building an institution and gymnasium at Royston.* Plans and specifications can be inspected on application to the Engineer, New Monckton Collieries, near Barnsley.

No date. Leeds.—*Erection of a weaving shed in Whitehall Road, Leeds*, for Messrs. William Lupton and Co.; schedules of quantities can be obtained on application to S. E. Smith, F.R.I.B.A., 12, South Parade, Leeds.

No date. Leeds.—*Mining and metallurgical laboratories of the University of Leeds.* Persons desirous of tendering should apply in writing (stating whether all or separate trades) to Paul Waterhouse, architect, Staple Inn Buildings, Holborn Bars, London, W.C.

No date. Carlisle.—*Erection of a new drill hall* for 1st Cumberland Royal Garrison Artillery Volunteers. Persons desirous of tendering are requested to submit their names to Oliver & Dodgshun, FF.R.I.B.A., architects, Carlisle. Quantities will be supplied to such applicants only.

ENGINEERING.

August 2. Aylesbury.—*Repairs to Holman's Bridge*, Buckingham Road, Aylesbury; also for taking down and rebuilding the stone wing walls to the N. arch of Ickford Bridge, near Thame. Plans and specifications may be seen and further information obtained at the office of R. J. Thomas, county surveyor, County Hall, Aylesbury, where tenders must be delivered before 11 a.m. on August 2.

August 2. Aberdeen.—*Widening of Union Bridge* by the addition on each side of a steel arch rib and by extending the existing masonry abutments and all other work in connection therewith. Drawings may be seen and specifications, schedules of quantities and form of tender obtained from W. Dyack, borough surveyor, Aberdeen, on deposit of the sum of £5. Sealed tenders addressed to the Town Council of Aberdeen and endorsed "Tender for Aberdeen City Improvements, Union Bridge Widening," to be lodged with the Borough Surveyor not later than 11 a.m. on August 2.

August 4. Stoke-upon-Trent.—*Supply, delivery and erection of a water tube boiler.* Specification and form of tender may be obtained from P. J. S. Tiddeman, borough electrical engineer, on payment of a deposit cheque of £2 2s. Tenders to be sent in addressed to "The Chairman of Electricity Committee, Electricity Works, Stoke-upon-Trent," endorsed "Tender for Boiler," not later than August 4.

August 7. Dudley.—*Construction of a branch line* to Raggeridge Colliery, near Dudley, about 1¾ miles in length. Plans and specification may be seen and forms of tender and bills of quantities obtained at the office of the New Works Engineer at Paddington Station, between the hours of 10 a.m. and 4 p.m. Tenders, addressed to G. K. Mills, secretary, Paddington Station, London, W., and marked outside "Tender for Raggeridge Branch," will be received on or before August 7.

August 7. London, W.—*Erection of footbridges in steel at Panteg and Cwmbran, Monmouthshire, respectively*, for the Great Western Railway Company, Plans and specification may be seen and forms of tender and bills of quantities obtained at the office of the engineer at Paddington Station, between the hours of 10 a.m. and 4 p.m. Tenders, addressed to G. K. Mills, secretary, Paddington Station, London, W., and marked outside "Tender for Footbridges," will be received on or before August 7.

August 7. Penrith.—*Building of river walls and construction of a steel girder bridge*, across the River Eamont in connection with their main outfall sewer. General conditions, specifications, bills of quantities, and forms of tender may be obtained and drawings inspected at the Town Hall upon receipt of a deposit of £2 2s. Full particulars may be obtained from Brierley, Holt, and Co., engineers, of Blackburn and Blackpool, or from their resident engineer, J. J. Knewstubb, Town Hall, Penrith. Sealed tenders, endorsed "Penrith Sewerage—Contract No. 3," must be delivered to G. Wainwright, clerk of the Council, Town Hall, Penrith, not later than August 7.

August 7. Weymouth.—*Reconstruction of the viaduct* carrying the Weymouth and Portland Line over the backwater at Weymouth, and the *erection of a new station* adjacent thereto for the Great Western Railway Co. Plans and specification may be obtained, and forms of tender and bills of quantities obtained at the office of the Engineer at Paddington Station, London, W., between the hours of 10 a.m. and 4 p.m. Tenders, addressed to G. K. Mills, secretary, Paddington Station, London. W., and marked outside "Tender for Works at Weymouth," will be received on or before August 7.

August 8. London, W.—*Wiring, telephones, and bells at the new buildings in course of erection at Isleworth.* The specification and particulars can be seen of W. Stephens, clerk to the Guardians, Union Offices, Isleworth, W., or at the offices of W. H. Ward. architect, Paradise Street, Birmingham, from whom all particulars respecting same may be procured. Tenders must reach W. Stephens not later than ten a.m. on August 8.

August 9. Bolton.—*Two Lancashire boilers* for the Electricity Committee of the Bolton Corporation. Specification and form of tender may be had on application to A. A. Day, A.M.I.C.E., M.I.E.E., borough electrical engineer, Spa Road, Bolton. Tenders, endorsed "Tender for Boilers," to be delivered not later than 12 o'clock noon, August 9, addressed to the Chairman of the Electricity Committee, Town Clerk's Office, Town Hall, Bolton.

August 9. Painswick.—*Supplying materials and constructing a reservoir* at Painswick. Also for the providing and laying of about 9,163 yards of 6in., 4in., C.I. Mains. and 1½in., 1in., and ¾in. galvanised piping, together with the necessary bends, t's, valves, &c., from Cashes Green to Painswick, Gloucestershire, for the Stroud Water Co., in accordance with plans and specifications, which may be inspected at the Company's office, 13, Kendrick Street, Stroud, on Mondays and Fridays. Tenders, to be endorsed "Extension to Painswick," are to be sent to the Secretary of the Company, 181, Queen Victoria Street, London, on or before August 9.

August 11. Stockport.—*One water-tube boiler, with superheater and stoker*, for their electricity works, Millgate, Stockport. Specifications and full particulars may be obtained on application to R. Lomax, acting borough electrical engineer, Electricity offices, Stockport. Intending contractors will be required to deposit the sum of £1 1s. for the specification, &c. Tenders, addressed "Chairman, Electricity Committee, Electricity Supply Works, Millgate, Stockport," and endorsed "Boiler," must be delivered on or before noon on August 11. Fair wages clause.

August 13. Dudley.—*Supplying and laying feeder and distributor cables.* All tenders must be for the complete work as specified. Specifications, general conditions and forms of tender may be obtained at the offices of R. P. Wilson, consulting engineer, 66, Victoria Street, Westminster, on payment of the sum of £3 3s. The tenders must be sent in on the official forms and all instructions contained therein must be complied with, All tenders (endorsed Section C2, "Cables") must be addressed to the Chairman of the Electric Lighting Committee and delivered at the Town Hall, Dudley, not later than 12 noon August 13.

August 13. Dublin.—*Colorifiers, drying horses, economiser, and masonry work* in connection with the steam generating apparatus and hot water supply at the Baths and Wash Houses, Tara Street, Dublin, in accordance with plans and specification, copies of which may be inspected at the Office of the City Architect, Municipal Buildings, Cork Hill, Dublin, daily from 11 a.m. to 4 p.m., Saturdays excepted. Copies of the plan, specification, and form of tender may be obtained in the City Treasurer's Office, on lodgment of £3. Sealed tenders, addressed to the Chairman of the Public Health Committee, are to be delivered at the Office of the Public Health Committee, Municipal Buildings, Cork Hill, not later than 4 p.m. on August 13. Tenders must contain the names and signatures of two solvent sureties, willing to be bound jointly and severally with the contractor in the sum of £100 for the due fulfilment of the contract. Parties tendering will be required to agree to the conditions that no tender shall be amended or withdrawn before the expiration of a period of six weeks from the date of delivery to the Committee. as well as to the ordinary code of conditions governing Corporation contracts generally, so far as they apply to the present work. The contractor whose tender is accepted will be required to pay the cost of the deed of contract, which will be measured at £5 5s.

August 15. Leeds.—*Steam, feed-water, exhaust, overflow, blow-off, and other pipes, valves, &c.*, in connection with a steam turbo-generator of 3,000 kilowatts, for the Electricity Committee of the Leeds City Council. Copies of the general conditions, specification, and form of tender, may be obtained from H. Dickinson, Manager of the Department, 1, Whitehall Road, Leeds, on payment of a deposit of £2 2s. Tenders must be in the form attached to the specification, and must be delivered to R. E. Fox, town clerk, Town Hall, Leeds, not later than 10 o'clock on August 15, in sealed envelopes endorsed, "Electric Lighting—Tender for Pipes, &c."

August 15. Barking Town.—*The construction of Light Railways* as follows for the Urban District Council. Contract No. 1, Rails, fishplates, and bolts. Do., No. 2, Permanent-way construction. Do., No. 3, Overhead line equipment. Persons tendering are at liberty to tender for any of the contracts or for all of the contracts, but not for part only of one Contract. Copies of the specification, with forms of tender and general conditions, may be obtained of H. Hargreaves, clerk to the Council, Public Offices, Barking Essex, on depositing a cheque for £5 5s. Applicants to state the contract for which they propose tendering. The works are to be carried out in accordance with the plans and specifications prepared by Hawtayne & Zeden, consulting engineers to the Council, 9, Queen Street Place, London, E.C., where plans may be seen and from whom further information can be obtained. Fair wages clause. Tenders, sealed and marked "Tender for Light Railways," to be addressed to the Chairman of the Electricity and Tramways Committee, Council Offices, Barking Town, and to be delivered to H. Hargreaves, on or before 12 o'clock noon on August 15.

September 4. Lancaster.—*Proposed re-construction of steam heating arrangements* and hot water service at County Lunatic Asylum, Lancaster. Tenders to be sent by September 4th (extended date) to J. T. Cheetham, clerk and steward.

IRON AND STEEL.

August 2. Ashford, Middlesex.—*Supply Delivery, and erection on their premises at Ashford, Middlesex, of the following plant and materials* for the Managers of West London District Schools. Contract No. 1.—Pipework and sundry apparatus for Exhaust Steam Heating System. Contract No. 2.—Pipe Trenches and sundry Builder's Work. Contract No. 3.—Chimney Shaft, Economiser Chamber, and Flues. Contract No. 4. —Two 50 kw. Steam Dynamos (high-speed D.A. vertical compound engines), and Boosters, an Electric Motor, Additions and Alterations to Switchboard, some 200 yds. of Cable, and sundry other work. Contract No. 5.—Alterations and extensions to Steam, Exhaust, Feed and Drain Pipes, a Green's Economiser, &c. Copies of the general conditions applicable to all the contracts, the specifications, drawings, and forms of tender may be obtained by application to F. G. Beeching, clerk to the managers, Ashford, Middlesex, at the schools, on payment of a deposit of £3 3s. for each section. Copies of the above-mentioned documents may be seen (but not obtained) at the offices of F. H. Medhurst & Lloyd, consulting engineers, 13, Victoria Street, Westminster, from whom all particulars of the work may be obtained. Persons tendering may inspect the schools on week-days, between the hours of 10 a.m. and 4 p.m. The tenders must be delivered to F. G. Beeching (as per instructions with the forms) not later than 6 p.m. on Thursday, Aug. 2.

August 7.—London, W.—*Supply of about 250 tons of steel bridge girders and other iron and steel work of British manufacture* for the Great Western Railway Co. Plans and specification may be seen and forms of tender and bills of quantities obtained at the office of the Engineer, at Paddington Station, London, between the hours of 10 a.m. and 4 p.m. Tenders addressed to G. K. Mills, secretary, Paddington Station, London, and marked outside "Tender for Girder Work," will be received on or before August 7.

August 7. Hemsworth.—*Supply of 1,982 lineal yards of cast-iron socketed water main pipes*, 3in. diameter, for the Rural District Council, also for the cutting and filling of trenches and the laying and jointing of about 1,982 lineal yards of 3in. cast-iron water mains at Thorpe Audlin, near Pontefract. Plan, etc., may be seen at the office of T. H. Richardson, surveyor, Hemsworth, from whom further particulars may be obtained. Tenders are to be sent to J. Scholefield, clerk to the Council, Hemsworth, near Wakefield, not later than August 7.

August 8. London, W.—*Iron staircase verandahs, &c.*, to be erected at new buildings now in progress at Isleworth. Plans and specifications can be seen of W. Stephens, clerk to the Guardians, Union Offices, Isleworth, W., or at the office of W. H. Ward, architect, Paradise Street, Birmingham, who will explain every particular and detail. Tenders must reach W. Stephens not later than 10 a.m. on August 8.

August 20. London, S.W.—*Supply. delivery, and erection complete, at the depot Queen's Road, Wimbledon, of a cart shed*, about 165ft. long by 30ft. span, with open sides, and consisting of galvanised corrugated iron roofing, steel roof trusses, and rolled steel stanchions, for the Corporation of Wimbledon. Detailed plans and specification may be inspected and forms of tender obtained on application to the Borough Engineer and Surveyor, Town Hall, Wimbledon. Sealed tenders, on the forms and enclosed in the envelopes provided, to be delivered at the Town Hall on or before noon on August 20.

No date. Brithdir.—*30 yards unclimable wrought iron fencing*, not under 4ft. 6in. high. Jones, 24, Station Terrace, Brithdir, *viâ* Cardiff.

PAINTING AND PLUMBING.

August 2. Manchester.—*Painting required at Ardwick Green, Birch Fields, Cheetham, Gorton, Bradford and Whitworth Parks* for the Parks Committee. Specifications may be obtained at the City Architect's office, Town Hall, upon payment of £1 1s. each. Separate sealed tenders, enclosed in the official envelopes, to be delivered at the above office not later than 9 a.m. on August 2.

August 2. Hastings.—*Painting, lime-washing, repairs, &c., at West St. Leonards Council School during the summer holidays* for the Education Committee. Specifications may be seen at the office of the borough surveyor, Town Hall, Hastings. Tenders to be sent to P. O. Buswell, Clerk of the Committee, 18, Wellington Square, Hastings, not later than noon on August 2, endorsed "Painting, &c., West St. Leonards School."

August 2. Derby.—1.—*Cleaning and Painting Stations, &c.*, at Montpelier, Redland, Clifton Down, Hotwells, Shirehampton, and Avonmouth. 2.—Cleaning and Painting Signal Works, St. Mary's Goods Depot, and Chaddesden Sidings, Derby, for the directors of the Midland Railway. Specifications may be seen, quantities and particulars obtained, on application at the Engineer's Offices, at Derby. Sealed tenders to be forwarded by post to the Secretary of the Way and Works Committee, Midland Railway, Derby, not later than 9 a.m. on August 2.

August 3. Nottingham.—*Taking out the old fittings and supplying and fixing new urinal fittings* and making other alterations to the existing urinals at Derby Road and Commercial Square, St. Ann's Well Road; plans may be seen and specifications and forms of tender obtained from F. B. Lewis, city architect, Guildhall, on payment of a deposit of £1 1s.; fair wages clause; sealed tenders to be delivered to S. G. Johnson, town clerk, Guildhall, Nottingham, at or before 10 a.m. on August 3, 1906.

August 4. Preston.—*Painting of the outside of Workhouse at Fulwood.* Copies of the specification may be obtained from J. Clarke, clerk to the Guardians, Union Offices, Preston, upon deposit of £1, and tenders, endorsed "Tender for Painting," should be sent to J. Clarke not later than August 4.

August 7. Cardiff.—*Painting and renovating East Moors, Roath, and Cathays Police Stations.* Copies of specification and form of tender may be obtained at the office of W. Harpur, M.Inst.C.E., City Engineer, Town Hall. Sealed tenders, endorsed "Painting Police Stations," to be sent to J. L. Wheatley, Town Clerk, Town Hall, Cardiff, on or before August 7.

ROADS AND CARTAGE.

August 4. Saffron Walden.—*Supply and delivery at Saffron Walden Railway Station of about 450 tons of granite macadam*, broken to 1¾in. gauge, for the Borough Corporation. To be delivered in such quantities as may be required before March 31, 1907. Samples of granite, with tender, to be delivered to A. H. Forbes, borough surveyor, not later than 12 o'clock on August 4.

August 4. Faversham.—*Supply of 970 tons (more or less) of Cornish granite or Rhenish basalt* broken to a 2-in. gauge, and of 130 tons (more or less) of clean ½-in. Guernsey granite, Cornish granite, or Rhenish basalt chippings free from dust. The material is to be delivered on to the Town Wharf, Faversham, in accordance with the rules and regulations of the wharf, or into carts or trucks, as may be directed by the Borough Surveyor. The whole of the material is to be delivered in such quantities and in such times not later than December 25, 1906, as may be ordered by the Borough Surveyor. Tenders must be accompanied by a sample of each material tendered for, and will not be considered unless so accompanied. Tenders, in sealed envelopes, endorsed "Tender for Road Metal," must be sent to A. Tassell, town clerk, 20, West Street, Faversham, not later than 12 o'clock noon on August 4.

August 6. Armagh.—*Laying a concrete footpath in the new street off Banbrook Hill*, to be known as Little Patrick Street, for the Urban District Council. The approximate quantities are—Kerbing 270ft., Channelling, 270ft., Concreting, 90 sq. yds. The specification can be seen at the office of the town clerk, Tontine, Armagh, on any week-day between 10 a.m. and 2. p.m. Tenders to be addressed to "The Chairman, Urban District Council," and to be delivered to J. Lennon, Clerk of the Council, Armagh, not later than 12 noon on August 6.

August 7. Horsham.—*Hire of steam roller with scarifier*, to commence work about October next. Further particulars and forms of tender may be obtained of W. Dengate, surveyor, 58, Park Street, Horsham. Sealed tenders, marked "Steam rolling," must reach A. C. Coole, clerk, 9, Carfox, Horsham, on or before August 7.

August 7. Manchester.—*Making up Manley Road, Whalley Range; Longford Road, Chorlton-cum-Hardy; Ellesmere Road, Chorlton-cum-Hardy: Chatsworth Road, Chorlton-cum-Hardy: Passage alongside Cheshire Lines Railway; Chorlton-cum-Hardy.* Plans, sections and specifications of the work can be seen, and a form of tender with quantities and any further information obtained from the Surveyor to the Committee, Town Hall, West Didsbury. Tenders to be endorsed "Tenders for Street Works," and to be addressed to the Chairman of the Withington Committee, Town Hall, West Didsbury, not later than noon on August 7.

August 8. London, N.—*Formation of new road at Muswell Hill.* Plans and sections can be seen and copies of specification obtained upon personal application to Vigers & Co., 4, Frederick's Place, Old Jewry, E.C. Tenders to be delivered to C. J. Hayter, 84, Temple Chambers, Temple Avenue, E.C., before two o'clock on August 8.

August 11. South Shields.—*Constructional work and paving thereto for the carrying out of the permanent way and track*, including steel rails, points, crossings and other auxiliary work for the Boldon Lane and Hudson Street Extension of the South Shields Corporation Tramways, 3 furs. 1·20 chs. double lines, equal to about 6 furs. 2·40 chs. single track for the Tramways Committee. Copies of the specification and quantities, including conditions and form of tender, and also forms of contract can be obtained, and the general and detail drawings seen, at the office of S. E. Burgess, M.Inst.C.E., borough engineer and surveyor, Chapter Row, from whom all further information may be obtained. Tenders, on forms supplied, sealed and endorsed "Tender for Tramways Permanent Way, Boldon Lane Extension," must be delivered to J. M. Hayton, Court Buildings, South Shields, on or before 12 noon, on August 11.

SANITARY.

August 8. Buglawton.—*Construction of about 1,965 yards of 6in., 9in., and 12in. pipe sewers*, with the necessary manholes, lampholes, ventilating shafts, and other works connected therewith, for the Urban District Council. Drawings and specifications may be seen, and bills of quantities and form of tender and all information obtained at the office of C. Russell Hall, engineer and surveyor, Chapel Street, Congleton, on payment of £5 5s. for each contract. Sealed tenders, endorsed "Sewerage Works," to be delivered to A. Andrew, clerk, Wagg Street, Congleton, not later than August 8.

August 8. Portsmouth.—*Construction of sewers, manholes, pumping station, attendant's cottage and all accessories* in Copnor Road, in the borough of Portsmouth, together with Crossley's gas engines and centrifugal pumps. On payment of the sum of £5, a lithographed copy of the specification, general conditions, and bill of quantities, together with form of tender, can be obtained on application to A. Hellard, town clerk, Town Hall, Portsmouth, and any further particulars can be obtained at the Borough Engineer's office, at the Town Hall, Portsmouth. Tenders, marked "Tender for Copnal Road Sewer and Pumping Station," must be filled up, signed and returned, with the bill of quantities duly filled in, to the Town Clerk, not later than 10 a.m., on August 8. Fair wages clause.

August 8. Bedlington.—*Execution of the following sewerage work* for the Urban District Council. Tenders are invited for the construction of the following lengths of sewers, inclusive of manholes, gullies, connections, and other works: 1,288 yards lineal 18-in. earthenware pipe sewer; 161 yards lineal 15-in. earthenware pipe sewer; 72 yards lineal 12-in. earthen ware pipe sewer; 27 yards lineal 9-in. earthenware pipe sewer; 91 yards lineal 18-in. cast-iron outlet pipe sewer. Drawings and specifications may be seen, and quantities, forms of tenders, and all other particulars obtained by appointment at the office of J. E. Johnston, surveyor to the Council, Front Street, Bedlington. Sealed tenders, endorsed "Tender for Sewer, Bedlington Bank Top," to be sent to C. D. Forster, Clerk's Office, 24, Grainger Street West, Newcastle-on-Tyne, on or before 9 a.m. on August 8.

August 13. Bollington.—*Construction of the sewerage of Kerridge* for the Urban District Council. The works comprise about 1,853 yards of 7-in. and 8-in. stoneware pipe sewers, together with manholes, lampholes, and other appurtenant works. Plans may be seen and quantities and form of tender may be obtained at the office of W. H, Radford, C.E,, engineer, Albion Chambers, King Street, Nottingham, on deposit of £2 2s. A copy of the plans may also be seen at the office of S. Knight, clerk, Council Offices, Bollington. Sealed and endorsed tenders to be sent in to S. Knight on or before August 13

August 14. Spain.—*Execution of drainage works*, in accordance with conditions set forth in the "Gaceta," at the upset price of 102,907 pesetas (about £3,690). A deposit of 5,145 pesetas (about £184) is required to qualify any tender. Tenders will be opened on August 14 at the "Casa Consistorial, 5 Plaza de la Villa, Madrid."

August 17. High Wycombe.—*Refuse destructor.* Forms of tender, conditions, and plan of site may be obtained on deposit of £2. Tenders, sealed, endorsed "Destructor," and addressed to Chairman of Destructor Committee, to be delivered to I. J. Rushbrooke, borough surveyor and waterworks engineer, 77, Easton Street, High Wycombe, not later than noon on August 17

MISCELLANEOUS.

August 7. Greenock.—*Contract 2, oil and engine-room stores: contract 3, consumers' electricity meters*, for the Greenock Corporation. Specifications, schedules and forms of tender may be obtained on application to J. A. Robertson, electrical engineer, Municipal Buildings, Greenock, on payment of a deposit of 5s. for each specification. Tenders, enclosed in a sealed envelope and clearly marked to show which contract is tendered for, to be lodged with C. MacCulloch, town clerk, Municipal Buildings, Greenock, not later than 10 a.m. on August 7.

August 9. Gloucester.—*Supply of the following stores for 16 months, commencing* September 1, 1906, and ending December 31, 1907, for the Light Railways Committee:—Section 1, vulcanised rubber cables, insulating materials, &c.; section 2, ironmongery, bolts, nuts, screws, &c.; section 3, paints, varnish, &c.; section 4, general stores; section 5, lubricating oil, greases, &c.; section 6, incandescent electric lamps; section 7, car wheel tyres; section 8, iron, copper, brass, castings, &c. Specifications and forms of tender may be obtained from the General Manager, and samples of the various material may be seen at the depôt, Bristol Road. Sealed tenders, endorsed "Tender for stores" and marked with the section number, to be addressed to the Chairman of the Light Railways Committee, and delivered at the Light Railways Office, Bristol Road, Gloucester, not later than August 9.

August 27. Brisbane.—*Supply of telegraph wire and material, comprising 21¼ tons of copper wire, 200 lbs., H.D.; 4,700 copper tapes for 200 lbs. wire; 4,700 copper binders for 200 lbs. wire; 600 McIntyre sleeves; 5,350 Acme insulators; and 2,386 bolts for arms*, to be delivered at the Post and Telegraph Stores, Brisbane. Schedule forms, specifications, and general conditions may be had at the offices of the Comptrollers of Stores, Brisbane, Sydney, Melbourne, and Adelaide. Tenders sent by post must be registered. Tenders will be received at the office of the Deputy Postmaster-General, Brisbane, up to noon on August 27.

TOO LATE FOR CLASSIFICATION.

August 3. Rafford.—*Mason, carpenter, plumber, slater, plasterer and painter work of additions to Burgie School*, for the Rafford School Board. Plans and specifications can be seen with the Clerk, National Bank Buildings, Forres, or with Mr. Wittet, architect, Elgin. Tenders to be lodged with the architect on or before August 3.

August 3. Dallas.—*Water supply to the village of Dallas*, for the County Council of Elginshire. Plans and specification may be seen with C. C. Doig, C.E., 147, High Street, Elgin, and offers may be lodged with him on or before August 3.

August 6. Gartb.—*Erection of a manager's house* at Garth, Maesteg, for Messrs. Elder's Navigation Collieries Company, Limited. Plans and specification may be seen at the office of T. Gibb, architect, Post Office Chambers, Port Talbot, from whom bill of quantities may be obtained on deposit of £1 1s. Sealed tenders, endorsed "Tender for House," to be sent to W. S. Wardlaw, "Plevna," Maesteg, on or before August 6.

August 7. Girlington.—*Repainting and decorating (interior only) of the Baptist Sunday School, Girlington.* Specification may be seen at the school. Tenders are to be delivered at No. 4, Pearson Lane, Chellow Dean, Bradford, endorsed "Painting," on August 7.

August 8. Lynn.—*Erection and completion of dwelling house* at Hay Green, Terrington St. Clement, for the Old Stager Lodge of Oddfellows, Lynn. Drawings, specifications and conditions may be seen, and further particulars obtained, of H. T. Tilson, architect, 16, Railway Road, Lynn. Sealed tenders to be delivered to the architect not later than noon, August 8, endorsed "Tender for House, Terrington."

August 8. Grimsby.—*Erection of three public conveniences:*—1, Situate at the rear of the Palace Theatre; 2, situate at the River Head; 3, situate under the east end of the Newmarket Street Bridge. Copy of plans, schedule of quantities, and forms of tender can be obtained of H. G. Whyatt, borough engineer and surveyor, Town Hall Square, Grimsby, on deposit of £1 1s. Tenders, endorsed "Public Conveniences," to be addressed to the Chairman of the Urinals Committee, and delivered at the Town Clerk's Office, St. Mary's Chambers, Grimsby, not later than noon on August 8.

August 8. Kingussie.—*Mason, carpenter, plnmber, slater, plasterer, painter and glazier works of latrines, shelters and dykes to be erected at Kingussie School.* Plans and specifications to be seen with A. Cattanach, architect, Kingussie, and offers to be lodged with L. M'Intosh, clerk, School Board, Kingussie, on or before August 8.

August 10. Cwm.—*Erection of a house and surgery* at Cwm, for the Ebbw Vale Doctor's Fund Committee. Plans and specification may be seen and further particulars obtained at the office of H. Waters, architect, Beaufort, Mon. Sealed tenders, endorsed "Tenders for House and Surgery," are to be in the hands of T. J. Rees, secretary, 27, Alexandra Street, Ebbw Vale, on or before August 10.

August 13. Exeter.—*Painting, &c., at No. 1, Higher Summerlands, Exeter.* Specifications may be seen and full particulars obtained at the offices of R. M. Challice, architect, 14, Bedford Circus, Exeter. Sealed and endorsed tenders must be sent to A. Snell, clerk to the Guardians, New Buildings, Castle Street, on or before August 13.

August 25. Newport.—*Additions and alterations* for the Isle of Wight County Education Committee at the Technical Institute, Newport. Plans and specifications may be seen at the County Education Offices, Newport, I.W., or at the office of the architect, 5, St. Thomas's Street, Ryde, I.W., where all information may be obtained. Sealed tenders, endorsed "Technical Institute," must reach F. G. Flux, County Education Offices, Newport, I.W., on or before August 25.

August 25. Edinburgh.—*Additions to the Royal Victoria Hospital for Consumption, Edinburgh.* Applications for schedules must be lodged with Sydney Mitchell & Wilson, architects, 13, Young Street, Edinburgh. Schedules will be forwarded as soon as they are ready, and tenders must be lodged with the architects not later than August 25.

August 28. Fairfield.—*Construction of a Concrete Storage Reservoir* at Turner Lodge, Fairfield, near Buxton, to hold 4,000,000 gallons. Drawings may be seen, and copy of specification, bill of quantities, and form of tender obtained at the Offices of Swann & Brady, engineers, Town Hall, Chapel-en-le-Frith, *viâ* Stockport, on payment of £2 2s. Sealed tenders endorsed "Tender for Reservoir," to be delivered to C. Slater, at the Council Offices, Fairfield, Derbyshire, on or before August 28.

New Companies.

JOHN JONES (CHELSEA), LTD., to acquire the business carried on at the company's various branches as John Jones, and to carry on the business of engineers, builders, &c Capital: £10,000.

EMPIRE STONE CO., LTD., to acquire the business carried on at Leicester and Narborough as the Empire Stone Co., and to carry on the business of manufacturers of artificial stone and stone substitutes, stone merchants, &c. Capital: £50,000.

DURA MANUFACTURING CO., electric lighting and mechanical engineers, electricians, &c. Capital: £2,000.

KINGSDYKE (PETERBOROUGH) BRICK CO., to acquire the interest of the East Peterborough Brick Co., Ltd., and others, in the clay, sandstone, and other minerals under certain lands at Kingsdyke, Cambridgeshire. 32, Nicholas Lane, London, E.C. Capital, £10,000.

JOHN WOODHOUSE & CO,, to take over the business of a motor-car house and horticultural builder, carried on by Rosina Ault at Coventry, as John Woodhouse & Co. 158, Spon Street, Coventry. Capital: £2,000.

VICTOR A. SMITH & CO., LTD., builders' merchants, 3, City Buildings, Carrington Street, Nottingham. Capital: £12,000.

CITY MANUFACTURING CO. (BIRMINGHAM), LTD., to acquire the business of manufacturers of metal fittings and other goods carried on by T. Hawkins and E. E. Lewis at Bolton Works, Bolton Road, Small Heath, Birmingham, as the City Manufacturing Co.; and to carry on the business of metal workers, factors, merchants, builders, joiners, carpenters, engineers, ironfounders, wrought iron workers, tool makers, stampers, piercers, draughtsmen, manufacturers of metal and wood goods, makers of shop and general fittings, &c. Registered office: Bolton Works, Bolton Road, Small Heath, Birmingham. Capital: £25,000.

GENERAL CONSTRUCTION CO., LTD., to carry on the business of builders, motor-car manufacturers, jobmasters, wheel and tyre manufacturers, garage proprietors, hardware and furniture manufacturers, engineers, &c. Capital: £1,000.

Current Market Prices.

MISCELLANEOUS.

		£	s.	d.	£	s.	d.
Castor Oil, French ...	per cwt.	1	10	0	1	2	0
Colza Oil, English ...	do.	1	8	6		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	15	0	2	17	0
Lead, white, ground, carbonate	per ton	16	0	0		—	
Do. red	do.	15	0	0	0	19	0
Linseed Oil, barrels ...	per cwt.	1	0	7½		—	
Petroleum, American ...	per gal.	0	0	6⅛	0	0	6¼
Do. Russian ...	do.	0	0	5⅝	0	0	5¾
Pitch	per barrel	0	9	0		—	
Shellac, orange	per cwt.	10	12	0		—	
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Town	per cwt.	1	7	6	1	8	6
Tar, Stockholm	per barrel	1	5	0		—	
Turpentine	per cwt.	2	3	4½		—	

METALS.

		£	s.	d.	£	s.	d.
Standard Copper	per ton	83	0	0	84	0	0
Do. Strong sheets ...	do.	96	0	0	97	0	0
Lead, soft foreign	do.	16	15	0	17	0	0
Do. English	do.	17	0	0	17	10	0
Do. pipes...	do.	19	15	0	20	0	0
Do. sheets	do.	19	7	6	19	10	0
Galvanised Corrugated sheets	do.	12	10	0	12	15	0
Spelter G.M.	do.	26	5	0	26	10	0
Angles, Scotland	do.	7	0	0	7	2	6
Bars, do.	do.	7	17	6	8	0	0
Marked bars, Staffs. ...	do.	8	10	0	8	12	6
Common bars do. ...	do.	6	7	6	6	10	0
Angles, M'boro.	do.	6	10	0	6	15	0
Joists do.	do.	6	5	0	6	10	0
Angles, Midlands	do.	6	15	0	6	17	6
Joists, Midlands	do.	6	17	6	7	0	0
Girder plates, Midlands ...	do.	7	10	0	7	12	6
Angles, Foreign, c.i.f. Thames	do.	6	7	6	6	10	0
Tees do. do. do.	do.	6	10	0	6	12	6
Joists, Foreign, c.i.f. Thames	do.	6	2	6	6	5	0
Channels do. do. do.	do.	6	7	6	6	10	0
Plates do. do. do.	do.	6	15	0	7	0	0
Tin, Foreign	do.	169	0	0	170	0	0
Do. English ingots ...	do.	169	0	0	170	0	0
Zinc, sheets, Silesian ...	do.	30	10	0	31	0	0

TIMBER.

SOFT WOODS.

		£	s.	d.	£	s	d.
Deals, Archangel, Yellow, 2nd, 3×11	per std.	14	0	0		—	
Do. do. do. do. 3×9	do.	12	10	0		—	
Do. do. do. 3rd, 3×11	do.	9	15	0		—	
Do. do. do. do. 3×9	do.	10	5	0		—	
Do. do. Yellow (Tchovdinoff's) 3rd, 4×11	do.	12	10	0		—	
Do. Blankaholm, Yellow, 1st, 4×8	do.	10	10	0		—	
Do. do. do. do. 4×7	do.	9	15	0		—	
Do. do. do. do. 4×6	do.	10	0	0		—	
Do. Mesane, Yellow, 5th, 3×9	do.	9	10	0		—	
Do. Montreal, Spruce, 2nd, 3×9	do.	10	5	0		—	
Do. Onega, Yellow, 2nd, 3×9	do.	15	5	0		—	
Do. Petschora, Yellow, 3rd, 3×11	do.	10	10	0		—	
Do. Quebec, Spruce 1st, 3×9	do.	11	5	0	11	10	0
Do. do. do. (dry) 2nd. 3×7	do.	9	0	0		—	
Do. do. Red Pine (dry), unsorted, 3×11	do.	8	15	0	9	0	0
Do. do. do. do. (do.) do. 3×9	do.	9	0	0		—	
Do. St. Petersburg, Yellow, unsorted, 3×8	do.	9	15	0		—	
Battens, Archangel, Yellow (Tchovdinoff's), 3rd, 1×7	do.	10	5	0	10	10	0
Do. Fredriksstad, White, unsorted, 2×4	do.	8	10	0		—	
Do. Horneborg, Yellow and White, 2×6	do.	6	5	0		—	
Do. do. do. do. 2×4	do.	8	0	0		—	
Do. Hudikswall, Yellow and White, unsorted, 1½×6	do.	7	5	0		—	
Do. do. do. do. 1½×4½	do.	7	10	0		—	
Do. Gefle, Yellow, 1st, 1½×11	do.	13	15	0		—	
Do. do. do. (planed) 2nd, 1½×11	do.	11	10	0		—	
Do. do. do. (do.) do. 1½×9	do.	11	10	0		—	
Do. do. do. (do.) do. 1¼×11	do.	13	5	0		—	
Do. do. do. (do.) do. 1¼×9	do.	11	15	0		—	
Do. do. do. (do.) do. 1×11	do.	12	15	0		—	
Do. do. do. (do.) 2nd 1×9	do.	11	10	0		—	
Do. do. White (dry planed) 1st & 2nd, 1×9	do.	10	15	0		—	
Do do. Yellow (planed) 3rd, 1½×9	do.	9	10	0		—	
Do. do. (do.) do. 1×11	do.	9	5	0		—	
Do. do. White, unsorted 1¼×10	do.	11	0	0		—	
Do. do. do. do. 1×9	do.	10	15	0		—	
Do. Norrsundet (Gefle) Mixed Yellow (planed) 1¼×11	do.	10	10	0		—	
Do. do. do. do. do. (do.) 1¼×9	do.	10	5	0		—	
Do. do. do. do. do. (do.) 1×11	do.	11	5	0		—	

Battens, Gothenburg, Yellow, (planed), 3rd	per std.	£11	5	0	—
1×11	do.	9	15	0	—
Do, 'Mesane, Yellow, 5th, 2×9	do.	9	0	0	—
Do. Mon Yellow (planed), 1st, 1×8	do.	10	15	0	—
Do. Sandarne, white (planed) 1st, 1¼×9	do.	11	0	0	—
Do. do. do. (do.) 2nd, 1×9	do.	9	10	0	—
Do. Skelleftea, Yellow 2nd, 3×4½	do.	8	15	0	—
Do. St. Petersburg, Yellow, unsorted, 2½×5	do.	9	0	0	—
Do. do. do. do. 2×4	do.	9	15	0	—
Do. do. do. do. 2×3	do.	9	10	0	—
Flooring Boards, Dal. 2nd, Dram, Yellow, unsorted, 1×7	do.	0	9	9	—
Do. do. do. do. 1×6½	do.	0	9	3	—
Do. do. do. do. 1×6	do.	0	11	3	—
Do. do. Skonvik Yellow, 1st, 1×6	do.	0	11	6	—
Do. do. do. do. 1×6	do.	0	11	6	—
Do. do. do. do. 2nd 1×6	do.	0	10	9	—
Do. do. Gothenburg, Yellow, 3rd, 1×7	do.	0	10	0	—

New London Buildings

AT yesterday's meeting of the London County Council the Building Act Committee reported the following applications under the London Building Act, 1894, their recommendations as to consent or refusal being appended in *italics* :—

Erection of a projecting one-storey shop in front of No. 149, High Street, Lewisham, on the application of Mr. L. Jacob, on behalf of Mr. J. Jacobs. *(Consent.)*

Erection of an addition at No. 3, Acacia Road, St. John's Wood, on the application of Mr. W. R. Phillips, on behalf of Mr. J. M. Swan, R.A. *(Consent.)*

Erection of a crane of the "cathead" type, over the public way at the front of No. 71, Dean Street, Oxford Street, on the application of Mr. E. K. Purchase. *(Consent.)*

Erection of a projecting clock in front of the Lyceum Tavern, No. 354, Strand, on the application of Messrs. Brown and Barrow, on behalf of Messrs. Henekey. *(Consent.)*

Erection of a house on the north-western side of Chillerton Road, Tooting, to abut upon Back Lane, on the application of Mr. H. Bignold, on behalf of Mr. F. Hooper. *(Consent.)*

Erection of buildings on the south-eastern side of Clarence Road, Clapham Park, Clapham, on the application of Messrs. Ronald, Day & West, on behalf of Mr. A. G. Taylor. *(Refusal.)*

Erection of two porches in front of a proposed block of buildings between Nos. 18 and 20, Cavendish Square, St. Marylebone, on the application of Messrs. Gilbert and Constanduros. *(Consent.)*

Erection of projecting one-storey shops in front of Nos. 38 and 39, Chapel Street, Pentonville, on the application of Messrs. T. H. & A. M. Watson, on behalf of Mr. T. W. Dobson. *(Consent.)*

Erection of an oriel window at No. 60, Fenchurch Street, City, to abut upon Fenchurch Street and London Street, on the application of Mr. J. S. Gibson, on behalf of Mr. J. Carmichael. *(Consent.)*

Erection of a projecting oriel with balcony over in front of a proposed building on the site of No. 20, Warwick Street, Strand, on the application of Mr. J. N. R. Vining on behalf of Messrs. Liberty & Co. *(Consent.)*

Erection of porches and bargeboards in front thirteen houses in Rosendale Road, and six houses in Dalkeith Road, Wandsworth, on the application of Mr. C. M. Quilter, on behalf of Mr. S. Admans. *(Consent.)*

Alteration and rebuilding of workshops at the rear of No. 20, 22 and 24 Cyrus Street, Clerkenwell, on the application of Major C. E. Dance, on behalf of the Marquess of Northampton. *(Consent.)*

Erection of four dwelling-houses on low-lying land facing Ordnance Road, East Greenwich, on the application of Mr. Alfred Roberts, on behalf of Mrs. Colwell. *(Consent.)*

Erection of a dwelling-house and office on low-lying land at Dudgeon's Wharf, Manchester Road, Cubitt Town, on the application of Messrs. Frederick and T. Thorne. *(Consent.)*

Erection of a building to be known as the Piccadilly Hotel, to abut upon Piccadilly, Piccadilly Place, Vine Street, Regent Street and Air Street, on the application of Messrs. W. Woodward and W. Emden. *(Consent.)*

Erection of buildings abutting upon the new street, from Southampton Row, Holborn, to Vernon Place, on the application of Mr. R. J. Worley, on behalf of the Selected London Properties Company. *(Consent.)*

Formation or laying out of a new street for carriage traffic in continuation eastward of Jeddo Road, Hammersmith, on the application of Mr. H. Mair, on behalf of the Hammersmith Metropolitan Borough Council. *(Consent.)*

Construction of a generating station and works on the north-west side of Blackwall Lane, Greenwich, on the application of Messrs. Babcock & Willcox, on behalf of the South Metropolitan Electric Light and Power Company. *(Consent.)*

Erection of buildings with projecting shop fronts, bay-windows and balconies upon the site of Nos. 418 to 421, Strand, to abut upon the Strand and Exchange Court, on the application of Messrs. Crickmay and Sons. *(Consent.)*

Erection of a manual training centre at the Council's Westminster Bridge Road schools, to abut upon Westminster Bridge Road, on the application of Mr. T. J. Bailey, on behalf of the Education Committee of the Council. *(Consent.)*

Erection of five blocks of cottages and shops (section "C") on the southern side of Franciscan Road, Totterdown, on the application of Mr. R. Robertson, on behalf of the Housing of the Working Classes Committee of the Council. *(Consent.)*

Erection of buildings on the eastern side of Hoxton Street, Hoxton, at less than the prescribed distance from the centres of the roadways of Hoxton Street and Drysdale Street, on the application of Mr. G. H. Lovegrove, on behalf of Messrs. Yapp & Co. *(Refusal.)*

Erection of a projecting stone balcony on the Welbeck Street frontage of a building abutting upon Wigmore Street and Welbeck Street, St. Marylebone, on the application of Messrs. Wallace and Gibson, on behalf of Messrs. Debenham, Limited. *(Consent.)*

Formation or laying out of two new streets for carriage traffic on the Page estate, Eltham, Woolwich, and in connection therewith the widening of a portion of Well Hall Road, on the application of Messrs. D. Watney & Sons on behalf of Mr. C. H. Polhill. *(Consent.)*

Formation or laying out of a new street for carriage traffic to lead out of the western side of Wilton Road West, Hammersmith, so far as relates to the portion of such street as will be within the boundary of the County of London, on the application of Messrs. Weatherall & Green, on behalf of Major Cowper Essex. *(Consent.)*

Modification of the provisions of that section with regard to open spaces about buildings, so far as relates to the proposed erection of a building on the southern side of Marius Road, Tooting, with an irregular open space at the rear, on the application of Mr. H. Bignold, on behalf of Mr. F. Priddis. *(Consent.)*

Covering in of a portion of the yard at the Motor Bus Garage, Shrubland Road, Hackney, on the application of Messrs. F. Boreham & Son, on behalf of the Motor Bus Company, Limited, whereby an existing workshop building at such garage premises will be made to exceed in extent 250,000, but not 450,000 cubic feet. *(Consent.)*

Deviation from the plan for the erection of buildings on the southern side of Lower Road, Rotherhithe, opposite Neptune Street, so far as relates to the retention of a building and the erection of an addition thereto, in advance of the line approved on July 31st, 1905, on the application of Messrs. Newman & Newman, on behalf of the Guardians of the Parish of Bermondsey. *(Consent.)*

Erection of blocks 26 and 27, on the Totterdown Fields Estate, Tooting, to abut upon Blakenham Road, Coteford Street and Cowick Road, and also a variation in the forecourt boundary of block 27 where such forecourt boundary abuts upon Blakenham Road, on the application of Mr. R. Robertson, on behalf of the Housing of the Working Classes Committee of the Council. *(Consent)*

Erection of three dwelling houses to abut upon Claremont Place and Wells Tenements, Rotherhithe, within 20ft. from the centre of the roadway of Claremont Place, and exceeding in height the width of such street, and with boundary fences at less than the prescribed distance from the centres of the roadways of the said streets, on the application of Messrs. Stock, Page & Stock, on behalf of the Gomm estate and Messrs. Bisley & Sons. *(Consent.)*

Erection of porches and projecting eaves to a new wing to the Fulham Waste Lands and Lygon Almshouses, Fulham Palace Road, Fulham, on the application of Mr. E. Avern, on behalf of the trustees of the almshouses. *(Consent.)*

Erection of an enclosed iron and concrete gangway across King John's Court, Wood's Buildings, Great Eastern Street, Hoxton, on the application of Mr. T. H. Smith, on behalf of Messrs. Brown Brothers. The Council will be prepared to consider an amended application, accompanied by the necessary plans, showing the gangway to have open sides with balustrading not less than 3ft. 6in. in height. *(Refusal.)*

Deviation from the plans for the formation or laying out of a new street for carriage traffic to lead from Carpenter's Road to Homerton Road, Hackney Wick, so far as relates to an alteration in the levels of a portion of such road, on the application of Messrs. Deakin & Cameron, on behalf of the trustees of the late Viscount Eversley and the trustees of the late Major Clayton. *(Consent.)*

Deviation from the plans approved on 26th July, 1898, in connection with the rebuilding of Nos. 116 to 132 (even numbers only), Oxford Street, and Nos. 1 to 5, Wells Street, St. Marylebone, so far as relates to the erection of a first storey addition at the rear of No. 122, Oxford Street, and the erection of a gangway to connect the flat roof of such addition with Nos. 68 to 70, Berners Street, on the application of Mr. J. Slater, on behalf of Messrs. Bourne and Hollingsworth. *(Consent.)*

The Theatre and Music Hall Committee also reported the following :—

Drawings submitted by Messrs. Field & Sons showing certain alterations which have been carried out at the Surrey Vaudeville Theatre, Blackfriars Road. *(Consent.)*

Sketch plans submitted by Messrs. E. Runtz & Ford, on behalf of Mr. John Waring, of a new concert-hall proposed to be erected to front on Oxford Street, Dering Street and Tenterden Street. *(Refusal.)*

Drawing, submitted by Mr. A. O. Collard, showing the reconstruction of the existing wooden stairs and bridge over the railway between the Queen's Palace and the Central Hall at the London Exhibitions, Earl's Court. *(Consent.)*

Drawings submitted by Mr. I. Ibbetson and Mr. H. Tozer showing the alterations proposed to be effected at the Tivoli Music Hall, Strand, with a view to complying with certain of the suggestions made by the Council for the structural improvement of the premises. *(Consent.)*

Drawings, submitted by Mr. E. White, on behalf of Mr. Imre Kiralfy, of certain buildings to be erected in connection with the British Empire Exhibition, which it is proposed to lay out on a site about 82 acres in extent, situated on the west side of Wood Lane, Hammersmith. *(Consent.)*

Drawing, submitted by Mr. J. Jeffrey, showing three pairs of swing doors and a pass door which it is proposed to provide in the Upper Street entrance to the Royal Agricultural Hall, Islington, in lieu of the existing iron gates. *(Consent.)*

Drawings submitted by Messrs. J. E. K. & J. P. Cutts, showing the arrangement of a building to be known as the St. Michael's Parish Hall, which it is proposed to erect at Ullin Street, Bromley-by-Bow, and in respect of which it is intended to apply for a music and dancing licence. *(Consent.)*

Drawings, submitted by Mr. A. Moul, showing the alterations proposed to be carried out at the Alhambra Palace of Varieties, Charing Cross Road, with a viewt o complying with certain of the suggestions made by the Council in November, 1905, for the structural improvement of these premises. *(Consent.)*

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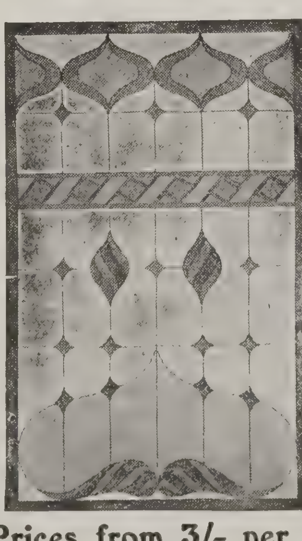

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Bankruptcies.

Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—adjudication.

During the week ending July 27th twenty-nine failures in the building and timber trades in England and Wales were gazetted.

A. Wright, late builder, Yarmouth. Liabilities, £406.

S. Booth, builders' merchant, Stockton Heath (late trading as the Peerless Patents Co.). P.E., Warrington C.C., Aug. 3, at 11. Adj., July 18.

W. Meadows, builder, Charlton and Greenwich. P.E., Greenwich C.C., Aug. 7, at 1. Adj., July 17.

P. Carroll, builder and contractor, Liverpool. R.O., July 17.

H. Taylor, engineer, Barrow-in-Furness. First meeting, O.R.'s, Barrow-in-Furness, Aug. 3, at 11.30. P.E., Magistrates' Court, Barrow-in-Furness, Aug. 3, at 3.

E. Turner, painter and decorator, Blackburn. R.O., July 21.

Coad Brothers, builders, Finchley. R.O., July 18.

Willis & Crouch, surveyors, London. E.C. Adj., July 16.

Moir & Co., timber merchants, London, E.C., and Broxbourne. P.E., Bankruptcy Court, Sept. 4, at 11. R.O., July 19.

D. Charles, builder and haulier, Llantarnam. P.E., Town Hall, Newport, Aug. 9, at 11.

G. Williams, late builder, Blaina. P.E., Tredegar C.C., Aug. 10, at 10,45.

A. Gray, builder and contractor, late North Gosforth and Wideopen. P.E., Newcastle-on-Tyne C.C., Aug. 9, at 11. R.O., July 16.

F. Richards, builder, Wolverhampton. First meeting, O.R.'s, Wolverhampton, Aug. 3, at 11.30. P.E., Wolverhampton C.C., Aug. 15, at 11. R.O., July 16. Gross liabilities, £347; deficiency, £54.

G. How, builder, East Sheen. P.E., Wandsworth C.C., Aug. 2, at 12.

Burgess Brothers, builders, Westbury. First meeting, O.R.s, Bristol, Aug, 1, at 11.30. P.E., Mechanics' Hall, Frome, Aug. 10, at 11.30.

Brett & Co., painters and decorators, Armley. First meeting, O.R.'s, Leeds, Aug. 1, at 11.30. P.E., Leeds C.C., Aug. 28, at 11. R.O., July 20.

W. R. Harrison, consulting engineer, Hull. P.E,. Hull C.C.. Sept. 24, at 2.

W. W. Lloyd, plumber and painter, Prestatyn. First meeting, Crypt Chambers, Chester, Aug. 1, at 12. P.E., Magistrates' Room, Bangor, Sept. 6, at 12.30 R.O., July 16.

T. Williams, builder, Llwynpia. First meeting, 135, High Street, Merthyr Tydfil, Aug. 1, at 12. P.E., Pontypridd C.C., Aug. 21, at 11.15. R.O., July 16.

T. Ridgway, builder, Lichfield. Deficiency, £332.

F. A. Simons, builders' merchant, Gravelly Hill Liabilities, £852; deficiency, £717.

T. R. Lightburn & W. Lightburn, builders and contractors, Benton. Gross liabilities, £2,766; net assets, £379; deficiency, £594.

Coming Events.

Wednesday and Thursday, August 1 and 2.

North of England Institute of Mining and Mechanical Engineers.—Excursion Meeting at Newcastle-on-Tyne.

Saturday, August 4.

North of England Institute of Mining and Mechanical Engineers, Newcastle-on-Tyne.—Annual Meeting at 2 p.m.

Saturday, August 11.

Northern Architectural Association.—Students' Sketching Club Excursion.

Monday to Saturday, August 13-18.

Architectural Association.—Annual Excursion.

Saturday, August 18.

Northern Architectural Association.—Visit to the Medical College and New Grammar School, Newcastle-on-Tyne.

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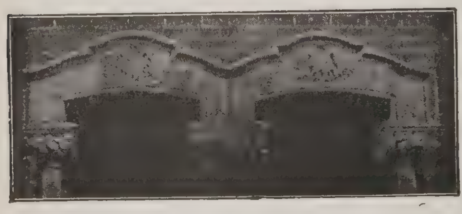
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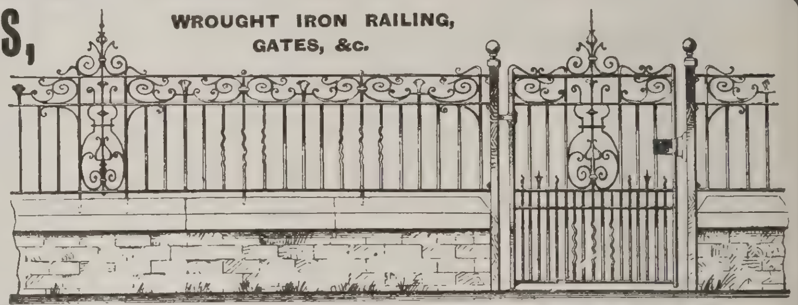
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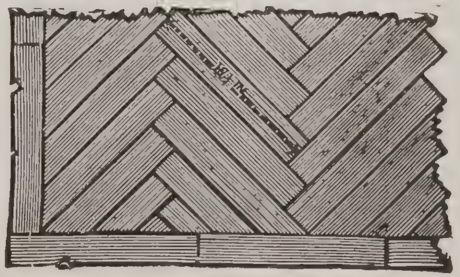

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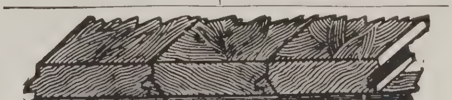
17¼ × 3 × 1½	6 9	6 3	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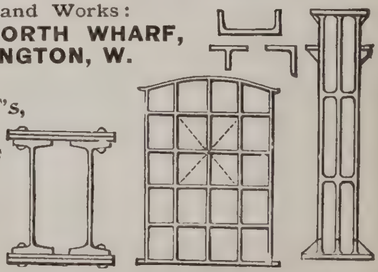
DELIVERIES FROM TOWN STOCK

THE BUILDERS' JOURNAL

AND ARCHITECTURAL ENGINEER.

August 1st, 1906.

FIRE SUPPLEMENT (MONTHLY).

REINFORCED CONCRETE AS A FIRE RESISTANT.

In our previous issue we referred to the resolutions of the International Fire Congress at Milan, which so clearly point to the fact that when reinforced concrete is intended to be fire-resisting it is necessary to observe special precautions as to the nature of the aggregate used, the size of the aggregate, the fineness of the cement and the thickness of the protective covering to the steel.

We regret that it has not yet been sufficiently recognised by those who design works in reinforced concrete that the material is not *ipso facto* to be classed as a fire resistant, but only when certain precautionary measures have been observed. Reinforced concrete with metal work only protected, say, to the extent of half-an-inch, with an unsuitable aggregate, is distinctly dangerous, and the danger is accentuated by the fact that, seeing that the materials used are incombustible, all too great a confidence is placed in them.

At the seventh International Congress of Architects, just closed, the subject of reinforced concrete was before one of the meetings, and here also a resolution was passed which pointed to the necessity of giving attention to the question of aggregate, the size of the aggregate and the thickness of the protection, where reinforced concrete is intended to be used as a fire resistant.

The two resolutions combined—namely, that of the fire service and that of the architectural profession—now together put the position so plainly that it should not be any longer overlooked by architects and engineers in practice.

The specialist in reinforced concrete—*i.e.*, the contractor—should be pleased at this pronouncement, for he has now something to go upon when he advises his employer to allow him to put on the additional thickness of material and utilise better aggregates. Of course, these precautionary measures mean some additional expense, but reinforced concrete is so much cheaper than ordinary forms of construction in buildings of the warehouse class that the additional percentage is scarcely appreciable.

The meeting was really intended to consider both the values of steel frame construction and reinforced concrete, but steel frame building was practically not touched upon. This is regrettable, as it would have been interesting to have had some pronouncement as to the value of protective materials as applied to steel frame construction, the San Francisco lessons having again been very much in favour of concrete.

In the current issue we publish a paper by Mr. James Sheppard, A.I.E.E., chief surveyor to the North British and Mercantile Insurance Co. This paper, we should add, received primary attention at the Milan Congress, being a subject to which great consideration is being accorded at the present moment by all interested in questions of fire protection. It was illustrated by a special series of lantern slides arranged in a most systematic way and taken from photographs and drawings published in the reports of the British Fire Prevention Committee. It is only to be hoped that these interesting slides may some day also be presented in the Metropolis on the occasion of some evening meeting, as they are quite unique and give a most excellent picture of the relative values of different forms of protection.

FIRE-RESISTANCE OF BUILDINGS CONSTRUCTED WITH REINFORCED CONCRETE.*

By James Sheppard, A.I.E.E.

Importance of Being Able to Attack Fire at Close Quarters.

All practical fire fighters will, in view of their own experiences, unanimously agree that the fullest success in fire-fighting can only be secured by vigorous attacks at close quarters inside the burning building.

Unless in some measure such close attacks on the discovery of a fire can be made, with ample volume of water at efficient pressure, the building involved, especially if of large extent, will probably, with its contents, be destroyed, and the prevention of the spread of fire to the surrounding property may become both difficult and dangerous. Buildings erected and fitted to guard against these dangers have lamentably failed under the test of actual fires, chiefly owing to non-compliance with conditions obviously necessary to secure success.

Nature of Buildings needed to assist Firemen.

To avoid such disasters, buildings effectually separated into compartments of moderate extent, planned without unprotected floor openings and constructed so as to give ready and secure access for firemen to every part, for the longest period of time possible after an outbreak of fire, are required both in the interest of the public and of the chief officers of fire brigades and salvage corps and the men under their command.

Buildings constructed with reinforced concrete, this concrete being properly prepared with suitable aggregated sand and cement, and ample thickness being continued in front of all metal rods or net work, will satisfactorily meet these requirements if the conditions as to extent and other provisions referred to are duly observed.

Danger of so-called "Fireproof" Buildings having Structural Metalwork Unprotected.

Experience has repeatedly proved that large buildings constructed with incombustible materials only, but without due protection against the inevitable action of heat, fire and water on the metal and other materials used, although called "fireproof," are during the burning of their contents of a most treacherous and dangerous character, defying all reliable calculations as to the time and manner of their certain collapse. Responsible officers therefore very properly hesitate to send men into or even close to such buildings after any portion may be well alight, and frequently structures of this nature are unavoidably left to their fate.

Responsibility of Architects and Engineers.

Why architects and engineers continue to waste their clients' money on the erection of dangerous buildings of this character and proclaim them "fireproof" is a mystery which firemen fail to comprehend. It cannot be too strongly asserted that it is false economy of the worst description to omit efficient protection against the action of fire for all structural metal work used in important warehouse and factory buildings.

Slow-burning Buildings.

In view of the experience referred to in the case of buildings constructed with unprotected metal columns and girders, the use of timber in posts and beams of large scantling with thick plank floors, made air and water tight, have been extensively employed with considerable advantage, especially where protected with an efficient system of automatic sprinklers. Further advantage would be secured if the timber used were made thoroughly and permanently flameproof, but effective processes with this object appear at present to be too costly for general use.

Reinforced Concrete Construction.

The term "reinforced concrete" is used to describe systems of construction in which iron or steel in the form of rods, bars or net work is embedded in concrete both horizontally and vertically so as to take all tensional strain and offer resistance to shear, leaving the concrete to resist compression, thus uniting both materials, so that each is applied to the best advantage.

Previous methods of fire-resisting and slow-burning construction, especially for warehouses, trade and manufacturing premises, are now rapidly giving place to reinforced concrete systems, used either alone or in combination with hollow reinforced concrete or porous terra-cotta blocks. These systems, it is hoped, will enable architects and engineers to meet conditions necessary to obtain resistance to fire.

Reinforced concrete is claimed by its advocates to be a new structural material, but this can only be conceded so long as normal conditions continue, which many users of these new structural methods appear to consider will always be the case, and therefore make no provision against possible, if not probable, changes resulting from fire amongst the goods stored in buildings of this construction.

The materials employed in reinforced concrete acquire no new fire-resisting qualities, and although they may be made effectively to assist each other in this respect and offer every facility for providing buildings of the character needed in the interest of the public and of firemen before mentioned, it is necessary, to secure such qualities, duly to consider and provide against the effect of heat, fire and water on the materials employed, using only materials and methods proved from actual experience under various known conditions to be effective. This is equally necessary with reinforced concrete systems as with other methods of construction, if satisfactory resistance to fire is expected and the avoidance of disasters that have occurred with other systems desired.

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* A paper read before the recent International Fire Congress at Milan.

Building Codes and Fire Insurance Regulations on Reinforced Concrete.

The City of New York Building Code, 1901, provides that all systems of floor construction used in buildings required to be "fireproof" shall be submitted to an official test for four hours under a distributed load of 150lbs. per sq. ft., placed on bays 4ft. wide between steel beams 10ins. deep, weighing 25lbs. per ft. run, having a clear span of 14ft., these beams being protected in the manner adopted by the system under test; the temperature to average not less than 1,700° Fahr. for the whole period of the test.

At the end of this four hours' heat test a stream of water through a 1⅛in. nozzle under 60lbs. pressure to be applied to the underside of the floor for five minutes; the top of the floor to be then flooded with water under low pressure, and the stream from the 1⅛in. nozzle under 60lbs. pressure again applied to the underside of the floor for a further five minutes.

A load of 600lbs. per sq. ft. to be then placed between the beams equally distributed.

If during these tests any flame has passed or any part of the load has fallen through, or if the maximum deflection of the beams, having a clear span of 14ft., exceeds 2½ins., the use of the system is prohibited in any building required to be "fireproof." Similar test regulations are also applied to partitions.

The materials used, the method of application and workmanship employed in the structure under test, constitute the standard for the system when used in actual building.

The American National Board of Fire Underwriters, in their carefully considered Building Code, recommend that the thickness of protecting concrete for all important metal members in columns and beams of reinforced concrete should be not less than 4ins.

The Fire Offices' Committee of the United Kingdom require that for "standard fire-resisting buildings" constructed with reinforced concrete the aggregates and Portland cement used shall be of the special character defined, with a thickness of not less than 2ins. in front of all important metal members in columns and beams.

These requirements are the minimum that can be adopted with reasonable prospect of avoiding collapse in case of a serious fire amongst combustible goods stored in large buildings.

The Necessity of Precautions regarding Reinforced Concrete.

Hitherto architects and engineers who devote themselves to reinforced construction appear to be so confident of the strength and stability of this new structural material under all conditions that they fail to give reasonable attention to the fire-resisting qualities of the materials used, being quite content to declare that steel rods embedded in concrete must be more fire-resisting than any other combination of materials.

Published examples of the action of reinforced concrete under actual fire fail to give definite particulars with regard to the diameter of the reinforcing rods, the composition of the concrete used and its thickness in front of metal members. Information as to the nature of the fire and its extent, when extinguishing appliances are brought to bear, with the power of these appliances and water-supply available, are also usually of the vaguest description or altogether absent.

Any photographs submitted by interested parties illustrating the effect of the fire will doubtless be taken from points of view most favourable to the object the photographer desires to serve. Sometimes such photographs do not even illustrate the portions of the building affected by fire, but only parts damaged from some other cause, such as explosion or shock, having no bearing whatever on questions of fire-resistance.

Experts in reinforced concrete buildings agree that to obtain the best results (considered only from a structural point of view and under normal conditions) reinforcing rods must be placed near the outer surface of the concrete, a thickness of 1in. in front of the rods being generally adopted; but this thickness is altogether insufficient for the protection of metal rods against a serious fire, and the aggregates, sand and cement in the concrete used to protect the metal rods, are of the greatest importance.

It has been conclusively proved that concrete having gravel aggregates is especially unreliable under the action of fire, and the same may be said of other dense material. Aggregates that have passed through fire and are of a porous nature, such as broken stock brick, clinkers, clean coke-breeze, with finely ground high-class Portland cement and sand, offer the greatest resistance to fire, but even with these materials a thickness of at least 2ins. in front of all important metal members is essential for reasonable security.

There would be no difficulty in applying a thickness of 2ins. of concrete of this description for the protection of all metalwork, while the central portion of the concrete might be of different material.

It is to be feared that some of the large buildings already erected with reinforced concrete will fail when subjected to a serious fire amongst their inflammable contents, especially in cases where the building chiefly consists of extensive galleries round large central vertical spaces passing through all floors; such buildings certainly involve the possibility of very serious consequences, as proved in numerous instances, and even reinforced concrete construction can do but little to lessen this evil. The Horne Building, Pittsburg, is a case in point.

The method adopted for protecting columns and other parts of reinforced concrete structures against mechanical injury during the trucking and deposit of merchandise is of the greatest importance. With this object in many large public warehouses, steel angles of considerable size and weight are partly embedded in the concrete flush with its outer face at each angle of numerous square columns supporting very heavy loads, these steel angles being held in place by riveted lugs passing into the concrete. In the event of a serious fire amongst merchandise stored round these columns the steel angles would twist, displacing portions of the concrete, leaving important reinforcing rods exposed at most critical moments. Any mechanical protection needed should be held in position independently of the concrete and be placed against its outer face only.

Divisional walls relied upon as fire stops in warehouses and similar buildings should not be less than 9ins. thick.

In a fire test made in a reinforced concrete box having the lower side omitted, set on brick walls, the whole enclosing about 175 cubic feet, moisture was freely driven through the sides of the box, two of which were 6ins. and two 4ins. thick. The evaporation of this moisture kept the outer surface of the concrete cool, but on the passage of moisture ceasing, which it did at the end of the test of 45 minutes' duration, the outer surface of the concrete became very hot. Combustible goods against a reinforced concrete wall less than 9ins. thick would be liable to ignition by heat from a fire burning on the opposite side of the wall.

Some Examples.

With the kind permission of the Executive of the British Fire Prevention Committee, I am glad to be able to give a few photographic lantern views showing results following test of different classes of concrete and metal construction, in which all conditions are definitely recorded.

As you are all aware, the Fire Prevention Committee's tests are conducted under the Universal Standards of 1903, which require for classification, as affording "full protection" against fire, a fire test of four

A SCOTCH FLOUR MILL FIRE.

hours' duration (attaining 1,800 degs. Fahr.), followed by the application of water for five minutes from a steam fire-engine to a floor measuring at least 200ft. super. loaded with at least $2\frac{1}{2}$ cwts. per ft. super.; whilst other classifications are obtainable, such as that of affording "partial protection" and "temporary protection" for lesser periods and under less stringent conditions.

According to these standards it will be observed how few of the examples I am presenting have obtained the highest classification, and it will also be observed that some of the examples presented are entire failures.

A SCOTCH FIRE.

The two views on this and the preceding page of a fire which occurred recently at an old flour mill in Glasgow show how unsatisfactory the form of construction adopted is in many buildings of this class in Scotland, for this is typical of many similar factories. We have taken this opportunity of drawing attention to the need of re-building such structures. It will be seen from the view of the interior of the second floor on this page that the floors and roof are of ordinary exposed woodwork. This floor was a forest of shafting, hoppers, elevators, &c.

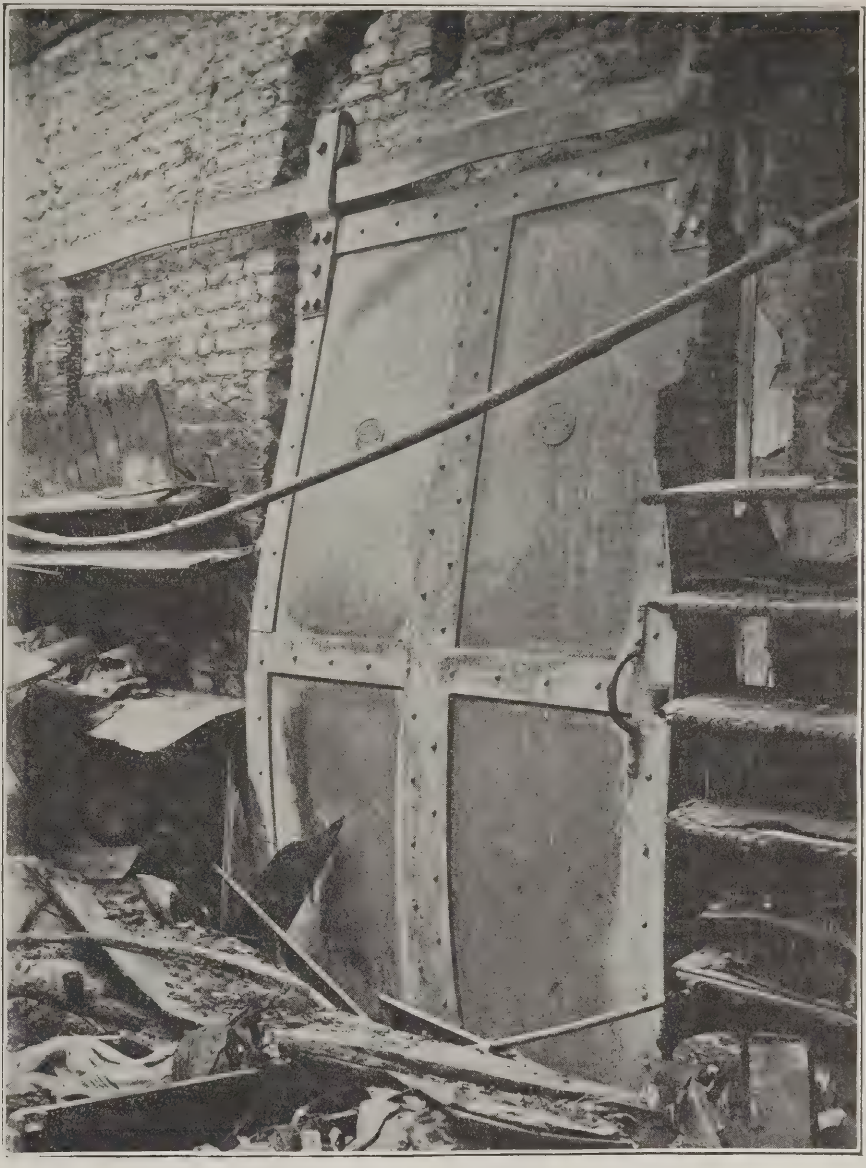
PROJECTING SHOPS.

The Walworth Road Fire and its Lessons.

The fire on July 18th, which commenced in the projecting drapers' shops, Nos. 342 and 344, Walworth Road, proves that the desired safety will not be secured by the provisions of the London Building Act, 1905, requiring that "the projecting portions (if exceeding 7ft.) of all new and existing shops shall be provided by the owner with a roof constructed with fire-resisting material not less than 5ins. thick." The regulation does not go far enough.

This fire originated in the shop window of No. 344 under the eyes of an assistant engaged in fitting incandescent electric lamps into their sockets with a 200 volt current on. The fire rapidly spread over No. 344 and No. 342, which are open to each other, amongst light goods hanging from lines, as is usual in other similar establishments.

Both shops extended under main buildings, having three storeys above. The whole was at once filled with smoke, and flame effectually cutting off the staircases, which were the only practicable way of escape from the upper storeys which were used for bedrooms.


THE BUCKLED DOOR AT WALWORTH ROAD FIRE.

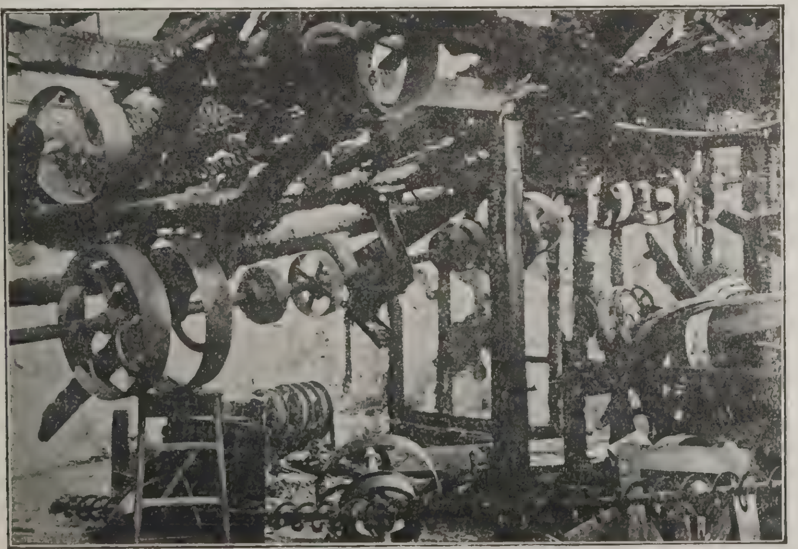
To obtain real security in such cases it is necessary that the fire-resisting material be continued over the portions of shops under the stories of main buildings, with a smoke and fire-resisting enclosure to stairs and a door from such enclosure direct to the open air.

It is to be hoped that the opportunity of the impending amendment of the London Building Act may be taken to somewhat strengthen the clause named in the first paragraph of this note. It is curious that this very necessary precaution should have been overlooked by all concerned in the framing of the amendment as passed.

At a time when various districts and associations of shopkeepers are petitioning the London County Council that the protection of the roof is too great a hardship, this fire should be an object lesson.

The original proposal of the London County Council for the London Building Acts Amendment Act, 1905, contained provisions to meet dangers in the main portions of buildings communicating with projecting shops which the rapid spread of smoke and fire in this case has shown to be very real, but such provisions were abandoned in consequence of powerful opposition from property owners.

Sec. 74 of the London Building Act, 1894, requires every building exceeding 10 squares in area, used in part for purposes of trade or manufacture and in part as a dwelling, to have floors and walls of fire-resisting material separating the trade from the dwelling portions with passages and staircases and other means of approach to the dwelling portion constructed throughout of fire-resisting materials. It is quite as important to apply this to existing as well as to new buildings.


A SCOTCH FLOUR MILL FIRE.

FIRE TESTS.

The British Fire Prevention Committee arranged by request of their continental and colonial members to conduct some of the current tests on Wednesday, July 18th, and Wednesday, July 25th, so that architect members of the committee visiting the seventh International Congress of Architects, and engineer members visiting the meetings of the Iron and Steel Institute, might have an opportunity of attending.

The testing operations of Wednesday, July 18th, were in respect to the wire glazing of window openings, and were of a most interesting character, as both different types of wired glass were under investigation, as also different casements. Both casements and wire glass are of American origin, the tests having been undertaken at the request of the Mississippi Wire Glass Co., of the United States.

On Wednesday, July 25th, the tests undertaken were with a reinforced concrete floor, Johnson's indented bars being the reinforcement, and slag concrete being employed.

Contemporaneous with these two structural tests, there were several tests on Wednesday, July 18th, with a fire extinguisher of the powder type, which is at the present moment the subject of investigation by the committee, the extinguisher being known as the "Kylfyre" extinguisher.

As was only to be expected, the tests brought together a very interesting attendance of members and friends, including such distinguished architects as Mons. Bonnier, architect at the Elysée, Paris; Herr J. Stübben, the former well-known city architect of Cologne; Mr. Alcide Chaussé, city architect of Montreal; in fact, representatives from the different parts of the world. There was also a very strong attendance on the part of the public authorities, most of the Government departments being represented, as also a number of municipal bodies.

Full reports will, of course, be issued in the ordinary manner by the committee, but in the meantime the operations might be summarised as follows:—

Mississippi Wire Glass Test.

The first test with three window openings having casements of hollow tin, iron and teak respectively, partly glazed with transparent and partly glazed with opaque wired glass, the whole being under test for classification as affording "Temporary Protection" (Class A)—*i.e.*, for the 45 minutes' test at temperatures ranging to 1,500° Fahr. This test was followed by one in which three openings were again glazed, two being fitted in hollow tin casements and metal casements respectively, whilst the third opening had glass applied direct to the framework.

This was a most remarkable test, inasmuch as, for the first time, wired glass was subject to test beyond the 45 minutes required for "Temporary Classification," the test being continued for no less than $1\frac{1}{2}$ hours at temperatures exceeding 1,500°, in fact, touching about 1,650° Fahr., the idea being to see whether wired glass could be put forward for classification as affording "Partial Protection."

At the conclusion of each test, water was applied from a steam fire engine for a period of 2 minutes.

GENERAL VIEW OF ONE OF THE PROJECTING SHOPS IN WALWORTH ROAD.

The "Kylfyre" Extinguisher Tests.

These tests took the form of a series, partially open-air tests, partially indoor tests, conducted in pairs with a view of obtaining average results, the extinguisher being always applied in the one case by an employee of the special manufacturer, and in the other case by an employee of the committee, the latter being changed about. These tests will probably serve for a basis for the arrangement of extinguisher tests generally.

Reinforced Concrete Floor Test.

This test was a four-hour test for the purposes of obtaining classification as affording "Full Protection" (Class B.), four hours of fire to a temperature up to 1,800° or over, followed by the application of water from a steam fire engine, and the floor being loaded $2\frac{1}{2}$ cwts. per ft. super. The test was conducted in a committee's large testing chamber, which has an internal dimension of 15ft. by 22ft. The reinforced concrete beams were thus of 15ft. span, and as there were three bays to the floor, each bay may be taken as having measured about 7ft. by 15ft. As indicated above, slag concrete was used, the cement being of the "Ferrocrete" brand of the Associated Portland Cement Manufacturers, Ltd.; the slag came from Nottingham. The floor was put up to the design of the Patent Indented Steel Bar Co., and indented bars were used throughout for the reinforcement of both beams and bays.

THE LONDON COUNTY COUNCIL'S FIRE REQUIREMENTS.

With some Notes on Fire-resisting Construction.*

By Percival M. Fraser.

The London County Council have from time to time received powers to draw up and enforce requirements for the protection of buildings and their inmates from fire.

The following classes of buildings are chiefly concerned by these requirements:—

1. Public buildings such as churches, concerts and assembly rooms, etc.
2. Factories and workshops.
3. Theatres and music-halls.
4. Common lodging-houses.
5. Commercial premises having a floor more than 50ft. above the pavement.
6. Buildings in which sleeping accommodation is provided for more than twenty persons.
7. Buildings having projecting shop fronts.
8. Buildings storing petroleum or other highly inflammable goods.
9. Buildings more than 30ft. high, except dwelling-houses occupied by not more than two families.

The following gives a detailed list of the requirements governing each class of buildings:—

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* A paper read at the meeting of the Institute of Sanitary Engineers, held at Manchester July 6th.

(1) Public Buildings.

The following provisions apply:—

1. The staircase must be brick enclosed. The staircases and corridors must not be less than 3ft. 6ins. wide for a building accommodating under 200 persons; for every additional 100 persons the staircase must be increased 6ins., until a maximum width of 8ft. 6ins. be reached.

Every staircase over 6ft. wide must have a central handrail. In lieu of a single staircase two may be substituted, each two-thirds the width, neither being less than 3ft. 6ins. wide.

Every gallery must have a separate staircase, with direct exit to the open air.

Doors must open outwards, with no fastenings outside.

This last requirement should be amplified so as to exclude any fastenings whatever save those which open automatically by pressure from the inside.

(2) Factories and Workshops.

An existing factory in which more than 40 people work must be provided with such means of escape as the Council consider reasonable under the circumstances of each case.

All new factories must be provided with proper means of escape.

Fire-resisting staircases should be of 2-in. teak or oak in flights of not more than 12 steps without winders. Treads to be not less than 10ins., and risers not more than 7½ins. Handrails should be provided on both sides, and carried round the landings.

The staircases should be on dead bearings, and enclosed with a partition of incombustible materials at least 3ins. thick, carried up through the thickness of the floors and ceiled with similar materials. All constructional ironwork should be incased. The staircases vary in width according to the number of people accommodated, but generally are 2ft. 6ins. for 100 persons, with 6ins. additional width for every further hundred.

Incombustible staircases must be brick enclosed with a newel wall; the walls to be 9ins. thick, and carried up and ceiled; no well-holes are allowed. The steps are to be solid square or spandril steps, supported at both ends on the brickwork. Handrails to be chased as far as possible flush with the walls.

Internal staircases are best placed against an external wall, and must be properly lighted and ventilated.

External iron staircases must be supported on dead bearings. The steps and landings to be of non-slippery material, and risers must be provided.

Handrails are to be supported on close balustrades about 3ft. 6ins. high.

Lifts must be enclosed for a height of 4ft. above each floor level with 9-in. brick walls or with incombustible materials, and hardwood self-closing doors must be provided in the openings. Lifts must not be connected with any staircase.

The doors must be of oak or teak, and must be solid without panels, and at least 1¾in. full of thickness. Doors of deal are allowed in lieu of hardwood, provided they are sheathed with iron and asbestos sheeting.

All doors must be hung in two folds to open in the direction of exit, and if fastenings are required only panic bolts or ball catches are allowed. Doors next staircases must be free of fastenings: and provided with metal springs to close them, They must be hung in lobbies so as to open clear of the steps and landings. The lobbies must be of similar materials to the enclosure, and must be ceiled, and the portion of the floor within the lobby must be pugged with 5ins. of concrete.

Doorways must not be less than 4ft. 6ins. wide.

Those portions of the floors forming parts of an enclosure must be pugged.

The topmost floors of high factories must be of fire-resisting construction.

Windows next the street should be casement windows, with cockspur fastenings only, and of a sufficient size to form an additional means of escape in case of Fire Brigade relief. These, however, are not considered to form an alternative, and are merely auxiliary means of escape. The glazing where forming part of an enclosure should be of either of the two forms sanctioned by the Council—viz., wire-wove glass or plate glass in electro glazing in 4-in. squares.

Iron ladders are allowed to facilitate roof escape. They are rarely used internally, but in some cases are allowed in conjunction with trap-doors, but they are not allowed in one flight between two floors. They must have flat treads and handrails both sides.

Balconies are allowed, and are useful to afford access between adjoining buildings when it is not desirable to cut doorways in the party wall.

Bridges are allowed for the same purpose, and they must not be enclosed.

Roof escape is effected by means of trap-doors and step-ladders from the top floor, or by continuing the main staircase up to the roof. This latter plan is inadvisable, as it creates a strong up draught when in use, and the smoke and flame are thus drawn into the staircase.

All parapets must be provided with guard rails, and gangways must be formed with boards, etc., where necessary.

Climbing irons may be used in certain positions. Double doors should be provided in the main party walls to divide buildings of a large size.

Gangways 3ft. 6ins. wide must be maintained between the means of escape.

(3) Theatres.

An important special requirement in this connection is that one-half of the boundaries of the site shall abut on public thoroughfares.

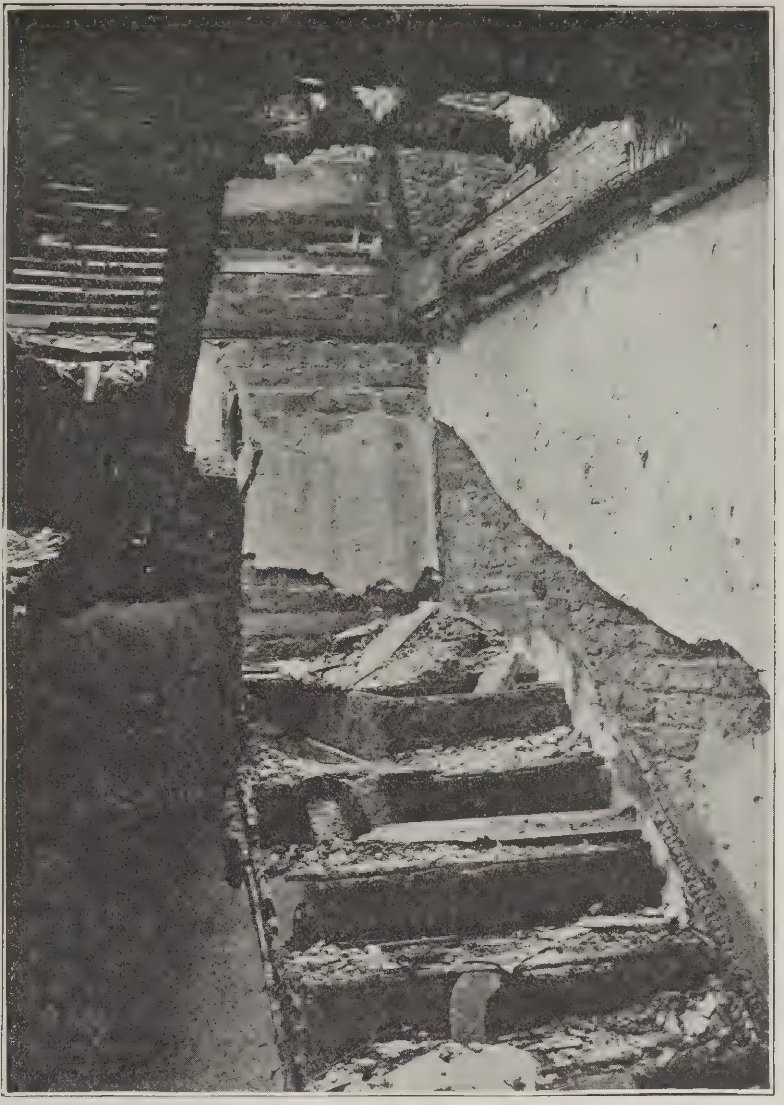
All staff and dressing-rooms must be of fire-resisting construction, separated by brick walls with iron doors from the auditorium, and no hanging decorations are allowed.

Two separate exits into different thoroughfares must be provided from each gallery.

The vestibules must be one-third greater than the united widths of all corridors connected thereto.

All doorways in the proscenium wall must be provided with self-closing iron doors. All decorations around the proscenium must be of fire-resisting materials.

The opening must be provided with a fire-resisting drop-curtain with an arrangement for a water spray on the inside.



THE STAIRCASE AT THE WALWORTH ROAD FIRE.

Every public staircase and corridor must be of fire-resisting materials and not less than 4ft. 6ins. wide for 400 people, and for every further 100 must be increased as described under public buildings. They must have solid steps of incombustible materials with 11-in. treads and 6-in. risers; flights to have not more than twelve and not less than three steps in each without winders.

The staircase shall be completely enclosed by 9-in. brick walls.

The staircases must be roofed with fire-resisting materials, and must have a continuous handrail on both sides chased into the walls where possible.

Gangways 3ft. wide must be maintained at all points, and must be kept free from temporary seats, &c.

All constructional ironwork must be properly protected.

All limelight tanks and boilers, etc., must be placed in a fire-proof chamber.

All thoroughfares which would be called into use in the event of a panic must be provided with a double system of lighting, such as gas and electricity, with oil or candle lamps, such lights being maintained whilst the public are on the premises.

No mineral oils or compo gas piping is permitted.

The stage, auditorium and staircases must be lighted by separate services and meters, both of gas and electricity.

Gas burners must have wire guards and chimneys, and the taps must not be available to the public.

All doorways used by the public must be at least 4ft. 6ins. wide; doors to be hung in two-folds to open outwards so as not to obstruct persons escaping. They must not open immediately upon a flight of steps.

Where fastenings are required they must be of such a nature that they will open automatically by pressure; no others are allowed.

Doors which are used in entrances may be hung to open both ways, but when opened inwards must be fastened back.

The above applies to all barriers and gates.

No open fires allowed except in staff-rooms, and to be protected by screens,

Radiators must not be placed so as to project into gangways.

The H.P. hot water system is not allowed, but hot air and the low-pressure hot-water circulation systems must be used, providing they have an open cold water supply cistern, and the pipes throughout are of galvanized wrought-iron with the exception of those in immediate contact with the boiler, which must be of copper.

The boiler must be of copper, wrought-iron or mild steel, with a safety valve attached to boiler, and not to circuit pipes, so as to keep it free from soot.

Hydrants must be provided, each having a 30-ft. length of hose.

With the intermittent system of water supply, storage tanks containing 250 gallons for every 100 persons in the audience shall be provided.

Theatres must be in telephonic communication with the nearest fire station.

Exits must be indicated by large and legible notices, placed about 7ft. above the floor; all doors not leading to exits shall be accordingly marked.

Wet blankets and fire pails must be kept in the flies and scene docks, with legible placards immediately above.

Hatchets, hooks and other appliances for tearing down scenery, etc., must be placed in convenient places, and a responsible person must be employed to see that such appliances are ready for use.

Fire regulations must be conspicuously posted up and the whole staff should be made acquainted therewith.

In conclusion of this class there are stringent regulations affecting the proper insulation of the electric wiring for the prevention of short circuits and ignition from other causes.

(4) Common Lodging-houses.

The requirements for this class of building are substantially the same as for factories and workshops, and are enforced by virtue of special Acts which provide that lodging-houses must be provided with means of escape, to the satisfaction of the Council before a licence is granted.

(5) Commercial Premises.

New commercial premises having a storey more than 50ft. above the pavement must be provided with an upward escape to the roof, with access from thence to the roofs of the adjoining buildings, by means of ladders, bridges, balconies, &c.

Guard rails must be provided where necessary.

(6) High Buildings and Buildings Accommodating more than 20 People.

All new and existing buildings having a floor higher than 50ft. above the pavement, and buildings in which more than 20 people sleep or work, must be provided with reasonable means of escape, and must not be occupied before being certified to this effect.

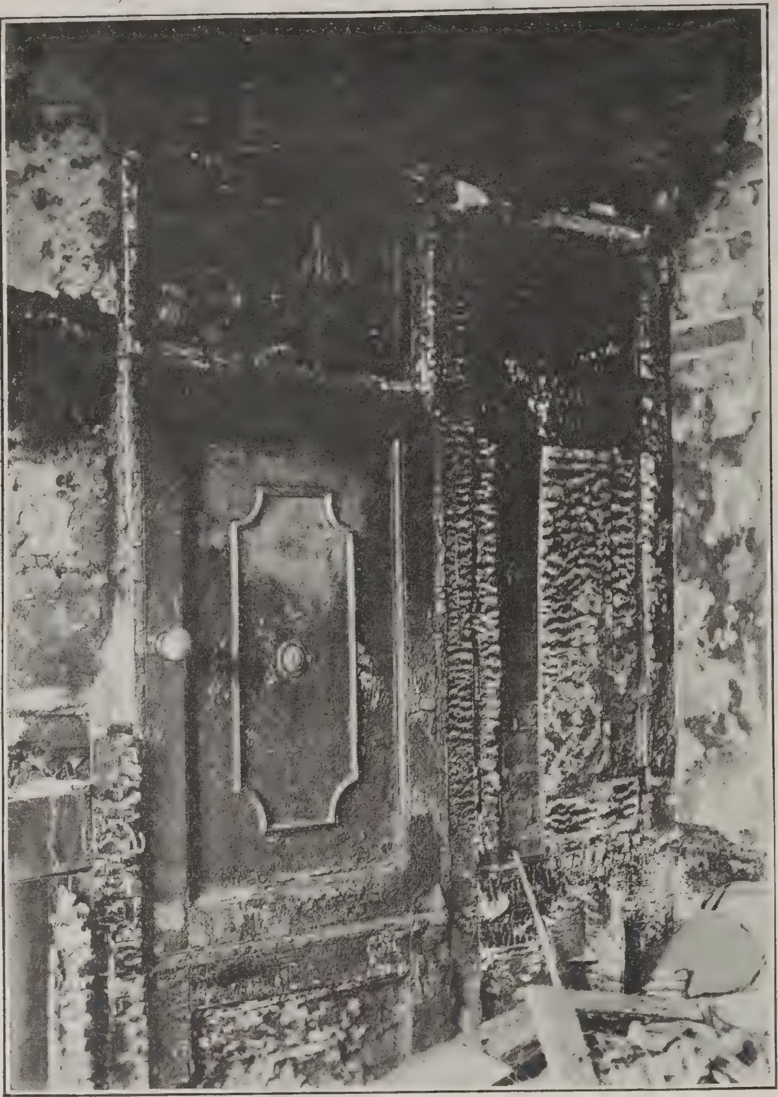
(7) Projecting Shop Fronts.

Any building having a shop front on the ground floor projecting 7ft. or more beyond the main front must have the roof constructed of fire-resisting material at least 5ins. thick. Concrete pugging is allowed.

Any roof lights must be constructed of fire-resisting materials for a height of 2ft. above the roof.

(8) Buildings Storing Inflammable Goods.

Buildings used for the storage of petrol, petroleum, turps, methylated spirits or any other inflammable liquids must not have any parts used as a living room or work-



THE SAFE AT THE WALWORTH ROAD FIRE.

room unless adequate safeguards are taken against the spread of fire, and unless ready means of escape are provided from the living rooms.

(9) Buildings more than 30ft. High.

New buildings of this class must be provided with roof escape. Buildings containing not more than two families are exempted from this portion of the Act.

The foregoing list gives but the merest outline of the actual requirements, and is intended only to show their scope. There is a number of saving clauses, and certain of the above-mentioned buildings are exempted.

In the case of existing buildings the general method of procedure when serving requirements is as follows:—Plans are prepared by the Council by the aid of which a list of requirements is formulated. It is usual for the official making the requirements to inspect the premises, but they are mainly drafted on the plans. This, I think, is the chief reason that a great many of the requirements are not practical.

The list as forwarded leaves all details and methods of construction to the building owner, so that it may be argued that the Council have no need to be strictly practical in their requirements.

It is usual for the building owner to submit proposals showing an alternative arrangement.

An important point to notice is that the Acts state that the Council are empowered to make only such requirements as are reasonable, which implies that each case is to be taken on its merits.

My experience of the London County Council is that they do not consider each case on a distinct basis, but attempt to apply stereotyped requirements without sufficient regard to the effect it will have on the business carried on in the building. Thus the provision of a new staircase is repeatedly insisted upon regardless of the fact that it may open up communication between workpeople of different sexes; again, in the case of patent and secret manufactures, facilities are afforded to undesirable persons to gain access.

External iron staircases are a continual source of thefts and other annoyances. Exit doors near the street must be set back in lobbies in order that the doors may clear the pavement. These recesses are put to improper uses in poor neighbourhoods such as factories and common lodging-houses generally occupy. The facilities for roof escape and the increased number of exits in the latter class of buildings necessitate the employment of a large staff for supervision, and cause serious trouble to the police, as they form a ready means of escape for the large number of criminals who use these premises.

The cost incurred in complying with the Council's requirements for a common lodging-house for 200 or more lodgers will generally run into three figures, and for these and also for factories the amount is often out of all proportion to the value of the premises.

There are many appeals therefore against what the building owners consider unreasonable requirements, but the Council's requirements have generally been upheld by the legal decisions.

The main principles employed by the Council in formulating requirements appears to be as follows:—

1. Separate and distinct means of escape from every room, with direct access to the open air, should be provided. This can be effected in several ways, such as by two staircases or by a staircase, and access to the roof, or access to adjoining buildings by means of doorways, balconies, bridges, etc. The alternative means of escape should be as far apart as possible.
2. The buildings should be divided up, both vertically and horizontally, into as many fire risks as possible by means of walls, partitions and floors, with self-closing doors, etc.
3. Well-holes acting as flues must be enclosed.
4. All means of escape must be protected with materials sufficiently fire-resisting to withstand fire for 30 minutes.
5. Means of escape must be of ample dimensions, and otherwise constructed to avoid accidents in time of panic, even though from a false alarm.
6. Endeavour should be made to keep back smoke as well as flame.
7. The most direct routes should be taken to the open air.
8. All "dead ends" should be avoided.

The following schedule of fire-resisting materials is set forth in the London Building Act:—

Good stock bricks.
Granite or stone.
Iron, steel or copper.
Slates and tiles.
Terra-cotta.
Flagstones under certain conditions.
Concrete formed of cement or lime and broken bricks, tiles, stone, ballast, pumice-stone, coke-breeze.
Reinforced concrete.
For doors and similar fittings, oak, teak, jarrah, or other hard woods, $1\frac{3}{4}$in. full, in solid bedded frames. The same for stairs, internal and external, with plaster soffits.
Beams and posts of hard woods with 1in. of plaster, on metal lathing, or when in combination with iron 2ins. of plaster.
For floors, concrete and iron 5ins. thick.
For ceilings of projecting shops, 5ins of concrete pugging.
Enclosures and partitions of 3-in. incombustible material.
Glazing in wire-wove glass $\frac{1}{4}$in. in thickness, or electro-glass in squares of 20ins.

It should be noticed that the provision of stone steps and iron doors is often required by Council. Both of these are quickly destroyed by the action of fire and water, and should, I think, be eliminated.

Notes on Fire-Resisting Construction.

The common expression "fire-proof" is hardly a correct term, as no building materials are proof against fire, and are still less so when built into a structure by reason of the joints and the different expansions of various materials under heat, when used in combination.

A material which will stand a great heat may immediately be destroyed when drenched suddenly with water, such as will certainly happen in any ordinary conflagration. A material cannot therefore be considered of value as a fire resistant until it has passed through fire and water.

The following précis of the effects of the great Cripplegate fire in London in 1897 is instructive:—

Ordinary stock bricks almost uninjured.
Perforated bricks broken to pieces.
Stone destroyed.
Iron girders twisted and curled up.
Wooden beams charred, but otherwise practically uninjured.
Match-boarding burnt to tinder.

Allowance for expansion must be considered. Concrete and iron expand in the same ratio, but terra-cotta and iron do not.

It is well to remember that although the first cost of fire-resisting construction is large, the insurance rates and rent roll are both favourably affected thereby. Architects should not take upon themselves the responsibility of specifying a material which has not been tested.

Elaborate tests have been carried out by the British Fire Prevention Committee with all the ordinary forms of construction and most of the well-known patents. They divide the tests into three classes: Temporary, partial, and full protection.

(To be concluded.)

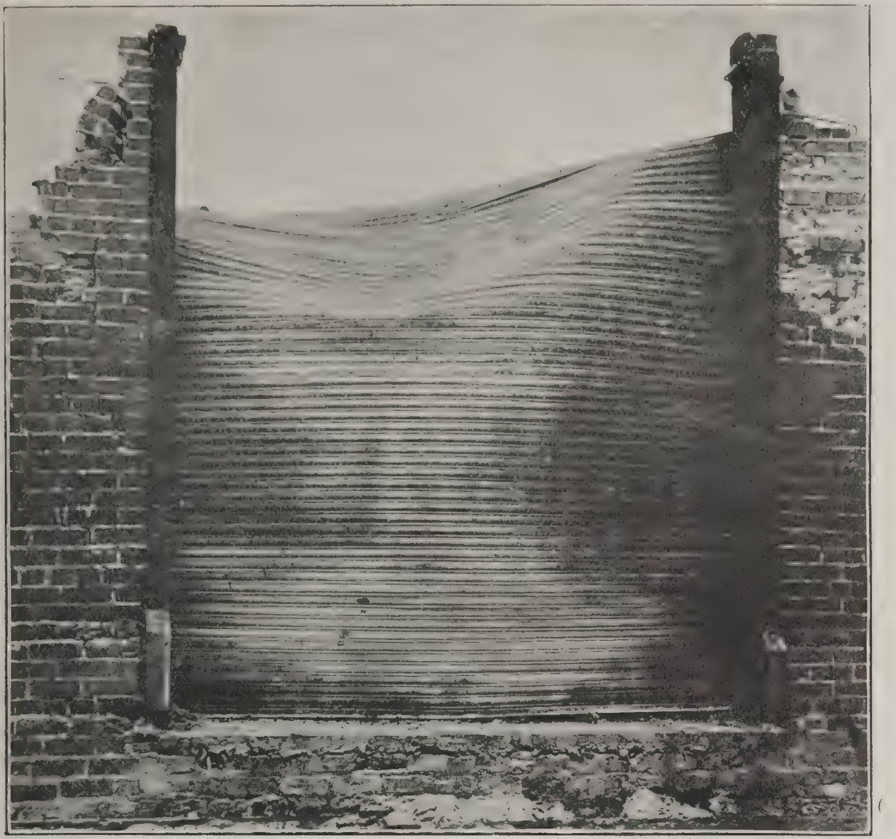


FIG. 1.—KINNEAR ROLLER DOOR AT STUYVESANT DOCKS FIRE.

THE PROTECTION OF VERTICAL OPENINGS BY STEEL ROLLER SHUTTERS.

In view of the attention which has lately been directed to the subject of the protection of openings by shutters or doors, and the tests recently made which have shown the general superiority of shutters and doors of the roller type, we have secured several photographs showing the results of actual fires upon the latter kind, and give below a general discussion of the subject, together with particulars relating to the illustrations.

In comparing the relative merits of the various methods available for closing or protecting doorways or other vertical openings, we have to consider the efficiency of any particular method as a means of closing the opening, more particularly with regard to its fire-resisting qualities, the ease and convenience with which it may be opened or closed, the question of obstruction when the door or shutter is open, and of encroachment upon any space that can be advantageously used for other purposes.

In all these respects, a steel rolling shutter of suitable construction has points of decided superiority to any other available method. It can be formed of thin sheet steel in narrow slats, the section of the slat being such as to secure the highest degree of strength and rigidity with the least possible weight, while the edges of the slats can be so interlocked as to form an extremely flexible hinge throughout the length of the slat. This interlocking hinge is also a feature which leaves the slats free to expand individually when exposed to intense heat, without buckling the shutter as a whole. Similar provision for expansion can be made in the face of the guides or grooves in which the shutter runs, by the use of slotted bolt holes. The malleable iron endlocks attached to the individual slat to prevent lateral movement, and to provide efficient wearing surface, have the further advantage of filling more closely the groove, and so preventing the passage of heat or flame in a case of fire.

The barrel round which the shutter is about to be coiled being furnished with counter-balance springs to take the weight of the shutter, the labour involved in raising or lowering, and consequently, the time occupied, can be reduced to a minimum, and the barrel containing the springs being protected by asbestos insulation, this property of easy operation is not liable to be destroyed by fire just when it may be most valuable. Nor is there any reasonable possibility of the grooves in which the shutter runs being so obstructed, by dirt or otherwise, as to present any obstacle to the immediate use of the shutter at any moment. In the case of grooves or tracks let into the floor, much difficulty might be experienced at the critical moment from this cause, and for the same reason any automatic provision for the closing of the shutter, in case of fire, controlled by a fusible link, is more reliable in the case of a roller shutter than in the sliding type of door.

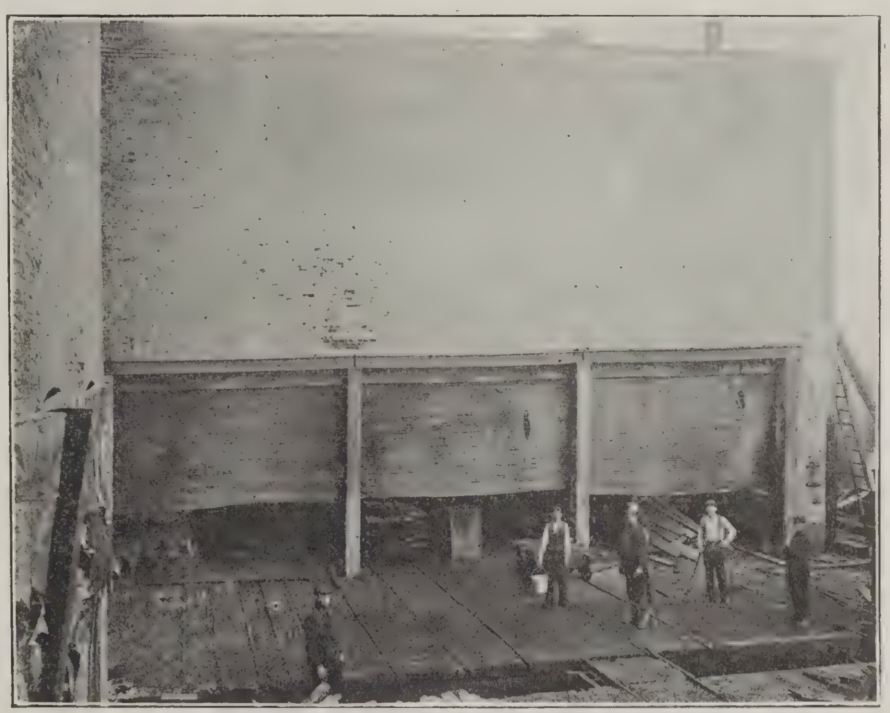


FIG. 4.—ROLLER DOORS AT A TIMBER YARD FIRE.

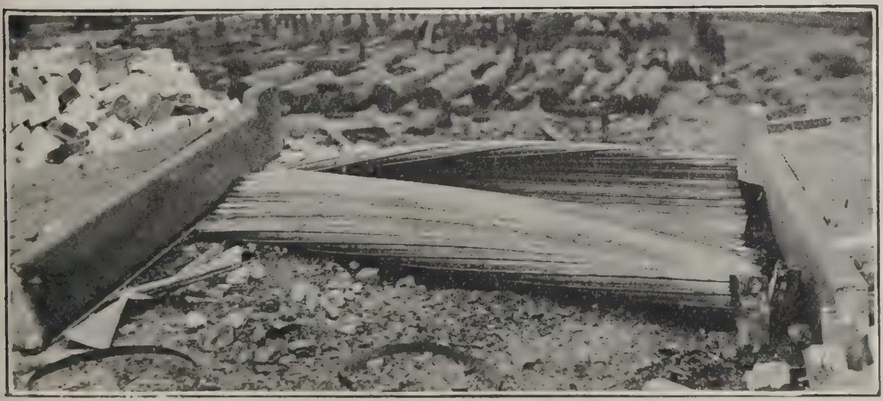


FIG. 2.—ANOTHER DOOR AT STUYVESANT DOCKS FIRE.

With respect to the question of obstruction, the guides or grooves only occupy a few inches of space at the edges of the openings, and even this slight projection can be easily avoided by placing the guides in chases or grooves formed in the thickness of the wall, while the shutter coil and brackets are quite out of the way at the top of the opening, occupying only a small space, and that in a position where it is least likely to be otherwise useful.

It need scarcely be pointed out that a rolling shutter, formed of separate slats, not interlocking, but joined only by ordinary hinges some distance apart, could not present a barrier for more than a few moments to a fierce fire, nor could it after a short exposure form anything but a more or less expanded trellis work.

It will be seen from figs. 1 and 2 how interlocking roller-shutter doors have stood up to the very last, and even with the terrible conflagration heat which can be seen to have spalled the bricks, these doors remained in position till the upper part of the holding gear fell with the upper portion of the wall.

Figs. 1 and 2 are photographs taken of a fire at New Orleans some time ago, when the Stuyvesant Docks were totally destroyed there. The fire consumed not only the buildings, but a number of railway trucks which stood on the tracks. The shutters had been put up five or six years previously, and were in good condition at the time of the fire. Most of them were applied to openings in the outside walls.

Fig. 3 shows a Kinnear roller-shutter at the entrance to a lift in a building which was destroyed by fire. From this it will be seen that the shutter was not damaged and could be readily raised after the fire. When the photograph was taken, men were at work inside the lift shaft repairing the small damage caused to the lift guides. The building had wooden floors, and as the wood floor burned away the shutter continued to drop until it found a seating on the iron floor joist, thus effectually stopping the fire penetrating to the lift shaft.

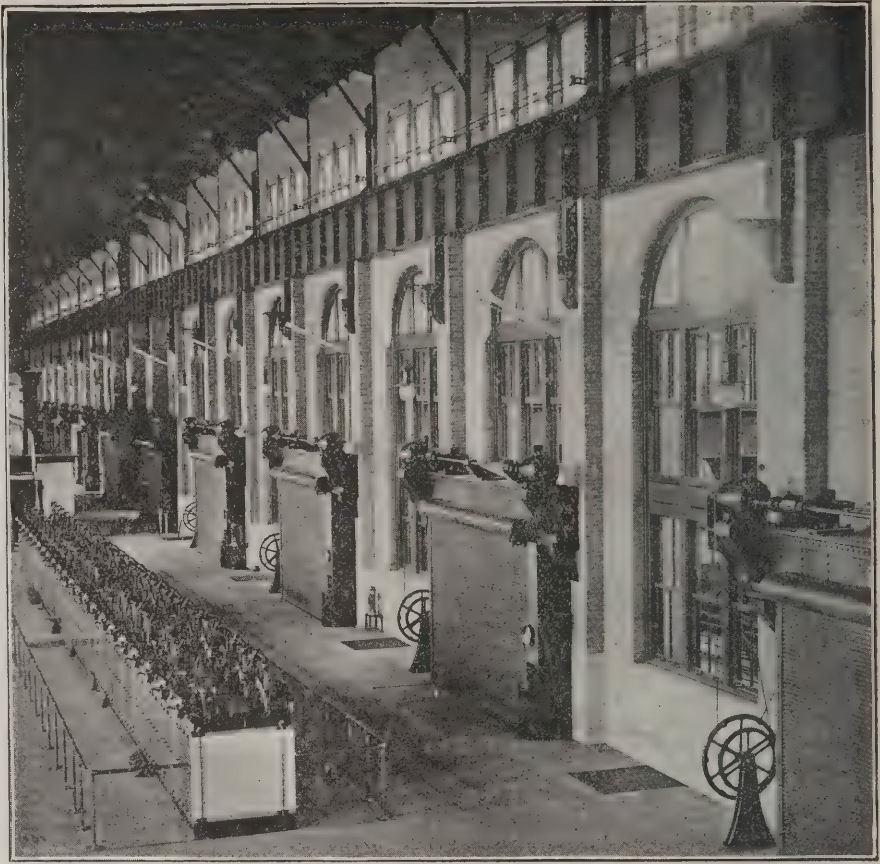


FIG. 5,—VIEW OF POWER HOUSE, NIAGARA FALLS ELECTRICITY GENERATING STATION.

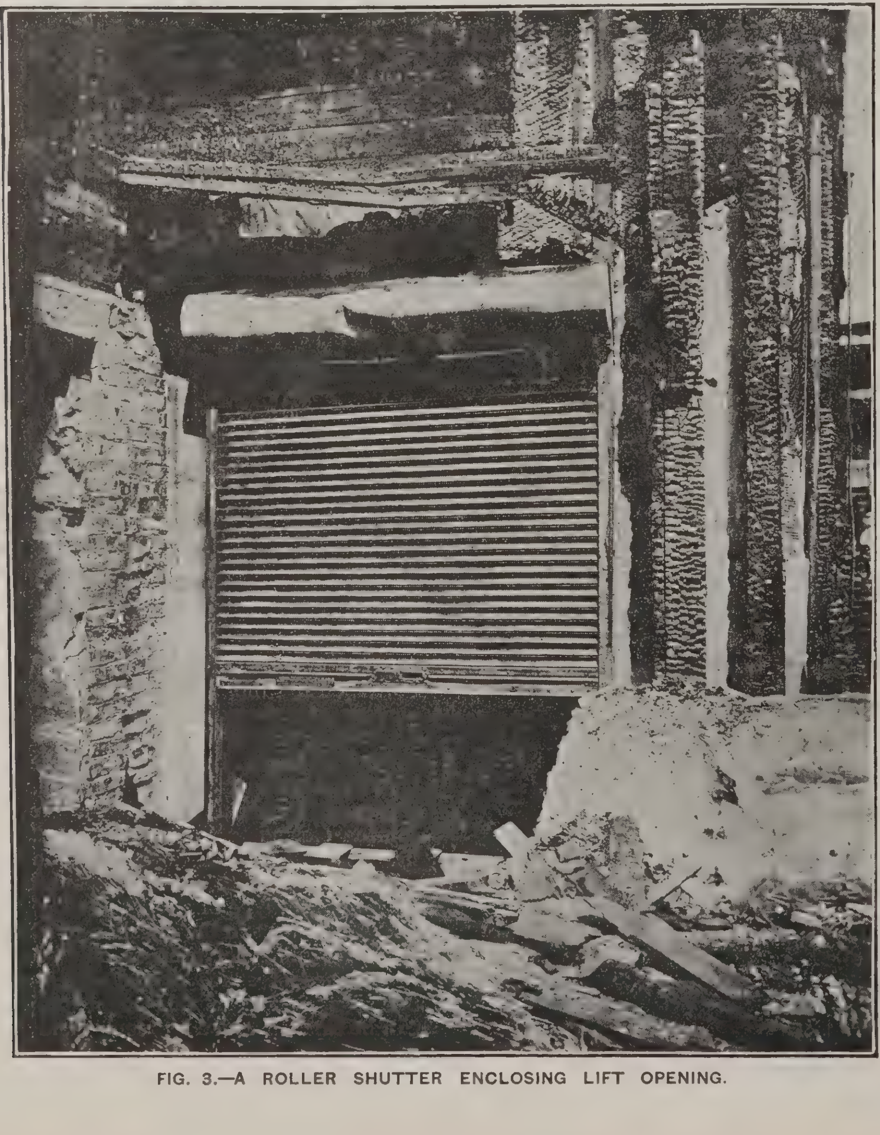


FIG. 3.—A ROLLER SHUTTER ENCLOSING LIFT OPENING.

Fig. 4 shows three Kinnear doors after a very severe fire in a timber merchant's yard. Two million feet of timber was stored in the space adjoining these doors, and this timber burned and the fire raged for four hours or more. The destruction of the wooden shutters covered with tin plates—*i.e.*, armoured doors—shown on the left of the view in the adjoining building, demonstrates the intensity of the heat. The roller-doors stopped the fire from entering the building to which they were fitted, and barring the cracking of the walls, as shown in the view, the interior of this building practically suffered no damage.

Fig. 5 is a view which, it is true, does not show the effect of fire upon shutters, but is interesting as illustrating a large building where a great number of these Kinnear rolling doors have been used. The view is of one of the power houses at Niagara Falls. It will be noticed that all these shutters are operated by electric motors, and that they are also arranged so that it is possible to operate them by hand in case of need.

Regarding the fire resistance of these roller shutter doors as demonstrated in Great Britain, nothing could be clearer in their favour than the series of tests undertaken by the British Fire Prevention Committee with the Kinnear type, first with a large single roller shutter door, described in this journal in a previous issue, and then with a single door for a long period—namely, 2½ hours—and with a double door for party wall purposes for a long period of 4 hours. These are also reported on in an earlier issue. Besides this, last May tests were undertaken with small roller shutters to window openings.

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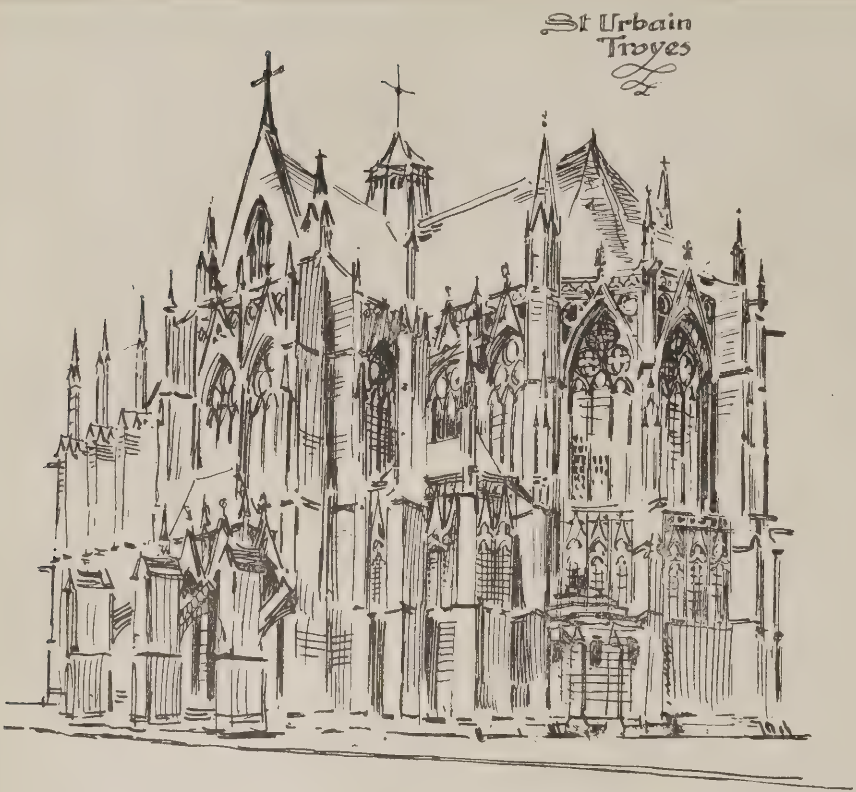
A Preliminary to Registration. IN the Irish Labourers Act, which has just passed the House of Lords, a clause has been introduced relating to the employment of architects in connection with work under this Act, which provides that every person so engaged shall satisfy the Local Government Board that he is qualified to discharge such duties. Mr. Redmond, M.P., observed in the House that he did not like this clause, and some of the Irish Nationalist papers comment unfavourably upon it also. Mr. R. M. Butler, a well-known Irish architect, has ventured to support the introduction of such a clause in the Act. While we agree in principle with his remarks, we think that at the present moment such action is open to question. He says: "With the proposition that a man should be competent to perform the duties he undertakes, and is paid for performing, no one can quarrel. So far as architects and engineers are concerned, all they complain of is that persons without the smallest semblance of qualification enter into competition with and obtain commissions as against men who have devoted time and money to acquiring a knowledge of their calling, and who have served a legitimate apprenticeship. Surely it is to the interest of the District Councils, the labourers, and the ratepayers that the best available service be secured. As to the suggestion that the addition of this clause is calculated to add to the cost of the schemes, I am convinced that the contrary will be the case. Economies in planning will be effected, and the tendency will be to promote better designed but not necessarily more costly houses." Of course, the only question the architectural profession is likely to raise at such a reasonable procedure is that the decision as to who is qualified to act as an architect should rest with the Local Government Board. This official department has quite enough duties to perform without attempting to judge as to architects' qualifications. We have yet to learn that this or any similar public body is qualified to act as an examining body for architects. If the architectural profession was fully recognised by Parliament and a Registration Act granted we should entirely support Mr. Butler, but it will be some years at least before this comes to pass. If, however, Parliament admits the principle that it is desirable that architects should have proved their qualifications for undertaking the design of buildings, as it appears it has, the first battle in the campaign has been won. The introduction of this clause into this Irish local government measure is of considerable importance to the profession and forms a precedent which registrationists should not be slow to avail themselves of. We must say, however, that for the moment, although we are glad to see Parliament admits the desirability of an architect being qualified, we must think the clause referred to creates an anomalous position in so far as a Government department is called upon to express an opinion upon an architect's qualifications to build dwellings for the working classes.

Metalwork in Buildings. THOSE who have visited Paris and the chief cities of the United States, or, indeed, those who have studied illustrations of French and American architecture, must all have had their attention caught by the extensive use of decorative metalwork made by the architects of these two countries. Considering the great charm this metalwork gives, it is indeed surprising that we do not find English architects following their lead. The reluctance which is displayed in England in the use of decorative metalwork is somewhat difficult to understand. We can ascribe our indifference to various reasons, but they seem almost too weak to serve as any excuse. We presume that the first reason advanced, if the profession were put on its defence, would be that of cost, but our public buildings, important office premises and other large buildings are not cut down to the narrowest limits of cost, and we must, therefore, come to the conclusion that if metal work is not used it is because money has been spent upon the provision of other decorative materials. There is an apparent desire on the part of many persons to bespatter the whole surface of buildings with ornament, and also to surface their walls and floors with expensive materials such as marble and mosaic. This betrays ignorance of the laws of architectural effect. Decoration may be rich, but it should not be overloaded. It is better to concentrate interest upon a few details that are good than employ much commonplace ornament, and it is an appreciation of this that is the *raison d'être* of the extensive use of metal work in France and the United States. Whatever the decoration employed by architects abroad it is, as a rule, not extensive, but it is choice, and the larger surfaces are on the whole plain, although skilfully proportioned and modelled. Rich and expensive materials are not used for whole surfaces, and, therefore, interest is attracted to the metal grills, staircase rails and balustrades, gates and marquises among other things. A solution to the question of cost, too, is obtained in other ways. Although in the United States a great deal of the decorative metal work in offices and public buildings, such as lift enclosures, is in bronze and brass, in France, on the other hand, we find much use made of wrought-iron, a material that not only is capable of being given great variety of form with an economy of labour, but is cheap in first cost. In France, too, extensive use is made of stock designs, although these are in such good taste that the casual observer never notices it. In consequence of this metal work is brought within the reach of architects of buildings where economy has to be carefully studied, such, for instance, as in working-class dwellings or apartment houses, these in Paris having a noticeable use of the material in the staircase handrails, entrance gates, window sills and balconies. We have heard it also said that metal-workers are few and far between in England, but there are a great many firms and craftsmen able and willing to do good work, and if the demand were created the supply would quickly be found. The architectural profession does not, however, as a rule trouble to study the necessities of metalwork design, and leaves the detail to trade firms; consequently, there is often a lack of taste, or if, as in some cases, the firms employ designers of ability they often display a lack of architectonic sense.

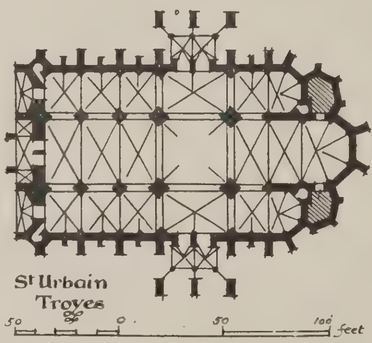

St Urbain Troyes

SOME NOTES ON TROYES AND ITS CHURCHES.—I.

By C. A. N.

THOUGH Troyes is now a busy and prosperous city, and though its citizens have lately changed the name of their old "Rue Notre Dame" to that of "Rue Emile Zola," the place has preserved an old-world aspect such as one rarely meets with in English towns of any importance, where historic landmarks have so often been destroyed in order to gratify the vanity of a municipality, or to testify to the skill of a latter-day architect. Its streets are still lined with ancient overhanging timber houses, often plastered over and modernised in front, but generally unaltered in the narrow side alleys which intersect the city. There are several large brick and stone houses of the sixteenth and seventeenth centuries; a pretty town hall with two-storeyed classic front, and courtyard with wooden galleries on one side like an old London inn; and the museum and hospital are both dignified stone buildings in the best style of the eighteenth century. The city, too, contains a series of fine churches, possessing decided local peculiarities, which series begins with the twelfth-century Madeleine and ends with several late Gothic and Renaissance buildings of great interest and considerable beauty.

The Madeleine is the oldest church in Troyes; its plan is unusual, the nave and transepts being of equal length and the nave having double aisles, so that the general outlines are approximately square. Nave and transepts each consists of a double bay with sexpartite vaulting, the aisles and crossing having plain groining. The choir has been extended in the sixteenth century, when a Flamboyant tower, which now carries a Renaissance belfry, was added at the south-west corner of the church.


St Urbain Troyes

The earlier parts of the building possess in a limited degree the refinement and delicacy of such contemporary works as the west front and the old belfry at Chartres. The design of the nave and transepts is of cathedral-like character, with low massive piers and arches, a large arcaded triforium, and a clearstory with an internal passage, very pleasingly vaulted in the gable windows. The first bay of the choir is early Gothic work, but the apse, the chapels, and the choir vault are late Flamboyant of the local type. In this part of the church the triforia are omitted and the resulting contrast between the airy and open sanctuary and the somewhat heavy nave and transepts is very striking. The well-known rood-loft in this church with its three hanging arches and the remains of altars on each side belongs to the same period as the apse. Its detail is of the utmost delicacy, particularly admirable being the treatment of the open work fleur-de-lis panels in the parapet, whose broad clean-cut surfaces, cunningly twisted, give value to the intricate vine work in the cornices and the arch crockets.

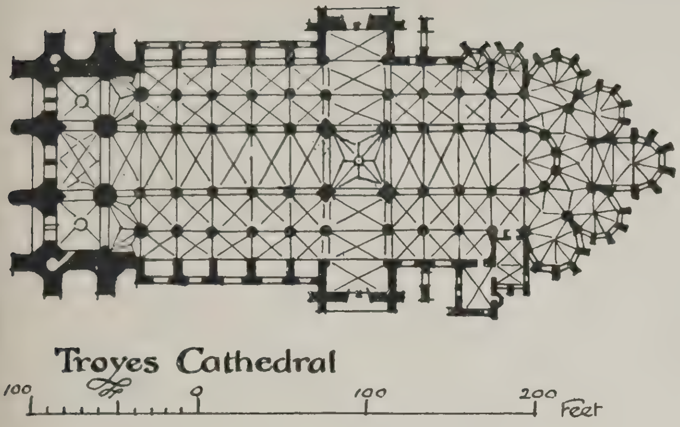
Hôtel de Ville Troyes

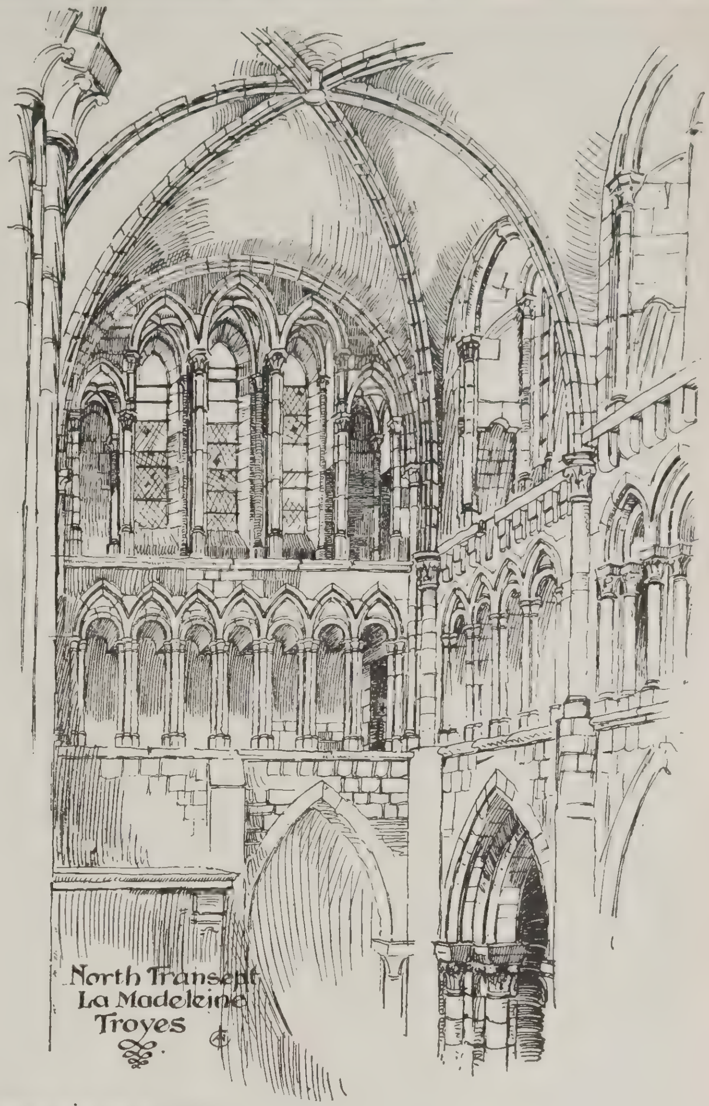
In spite of some "restoration" of its earlier parts, the interior of the Madeleine is essentially pictorial. There is good late glass of rich colour in the apse and chapel windows, parts of which have been very well restored. The tall round pillars of the chevet are panelled with seventeenth-century woodwork and the high altar, though of pseudo-classic design, is well proportioned and unobtrusive. Undoubtedly the church owes much of its charm to the preservation of its rood-loft, but it is strange how completely its builder, Jean Gualde, had in 1508 abandoned the ancient tradition of enclosing the choir. Here, as at St. Etienne du Mont at Paris, the loft spans the church without in any way obstructing the view of the altar, whereas in our old English examples, and in most of the few remaining French ones, such as those at Arques and Albi, the screen appears to have been considered as essential a piece of furniture as the loft which it carried.

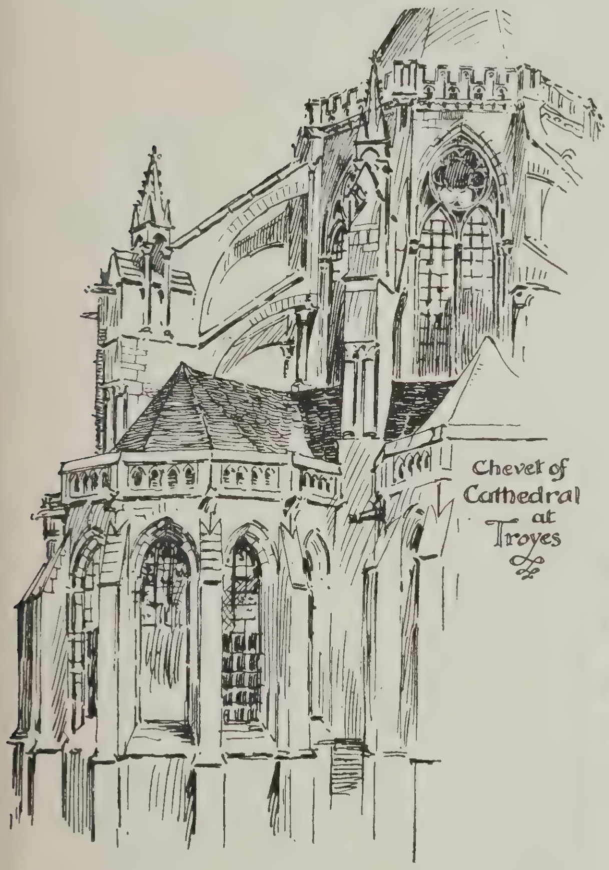
Externally the Madeleine is a picturesque medley of crumbling thirteenth-century and Flamboyant work. The treatment of the aisle roofs is worth notice, the inner bays having lean-tos against the nave and transepts, while the angle bays have low pyramidal roofs. To the south of the fine tower, in the Rue de la Madeleine, is the stone wall of the old cemetery, with a rich Flamboyant gateway (1525), and there is another simpler cemetery gate in the Rue Thiers to the east of the church.

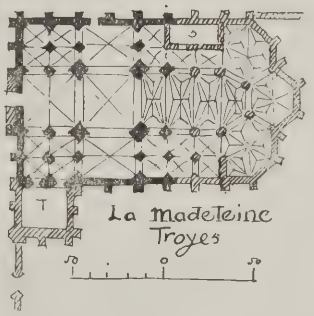
Hôtel de Vauluisant Troyes

Rue Champeaux Troyes


Troyes Cathedral


North Transept La Madeleine Troyes


Chevet of Cathedral at Troyes


La Madeleine Troyes

The cathedral choir and transepts are thirteenth-century work, the five-aisled nave is of the fourteenth, the chapels and west front of the fifteenth and sixteenth centuries, and the tower Renaissance. But, though the scale is good and much of the original glass has been preserved, the cathedral has neither the dignity of Reims nor Chartres, nor the romantic and mysterious beauty of such a church as the Madeleine. From a constructive point of view, however, it is of considerable interest. Viollet le Duc [cathédrale] describes its choir as an example of medieval jerry building. Its foundations were scamped, its masonry is of poor quality and small scantlings; everything has been sacrificed in order to produce an imposing effect as cheaply as possible. Under such conditions it was impracticable to adopt frankly the usual constructive system of large French Gothic churches with slight piers and a ring of massive buttresses to keep the vaults in their place. Here the clerestory and vaulting are of the lightest possible construction, and the buttresses are smaller than usual, while the piers and arches are comparatively massive, as if with the idea of throwing a considerable portion of the weight to be carried upon their foundations, and so minimising the work which the buttresses had to do. The experiment has not proved entirely successful, for the transepts are "buckled" in an unsightly and apparently dangerous manner, while the clearstory and vault of the choir had to be entirely rebuilt between 1850 and 1866.* It must, however, be remembered that the work had stood for six hundred years without substantial alteration, and this in spite of the fall of the central tower, which was destroyed by fire in 1700, and so it must be admitted that, considering the means at his disposal, the builder of the cathedral choir, who it is conjectured was a pupil of Thomas de Cormont, the thirteenth-century master-mason employed at St. Denis, must have been an artist of considerable ability and resource. Throughout the cathedral the triforia are glazed, and much of the glass is contemporary with the stonework. The thirteenth-century glass in the choir has all been restored and cleaned, and it is possibly on this account that it looks like an imitation of itself. The predominant colours are ruby and blue, the whole effect is a warm purple, and the glass is lacking both in richness and in sparkle. The fourteenth and fifteenth-century glass with which the triforia and clerestory of the nave are filled, is perhaps somewhat coarse and wanting in refinement, but the effect of so large an expanse of rich, full colour is extremely striking. The character of this glazing differs altogether from that of the fiery thirteenth-century glass at Chartres and Reims, as it does also from the silvery tones of the best English glass, such as that at York. Its colour is so strong and so much varied that the glass overpowers the architecture, and does not take its proper place in the general scheme of the interior. In the nave chapels is a good deal of fine late glass with clear backgrounds and rich Renaissance borders to the lights; the western rose has fine Renaissance glazing in a low key of colour; but perhaps the most effective glass in the cathedral is that in the gable of the north transept, which is almost entirely white, with some small but telling patches of colour.

The nave has double aisles of equal height, and is well and solidly built, but its architecture is not of an inspired order, and externally the chapels between the

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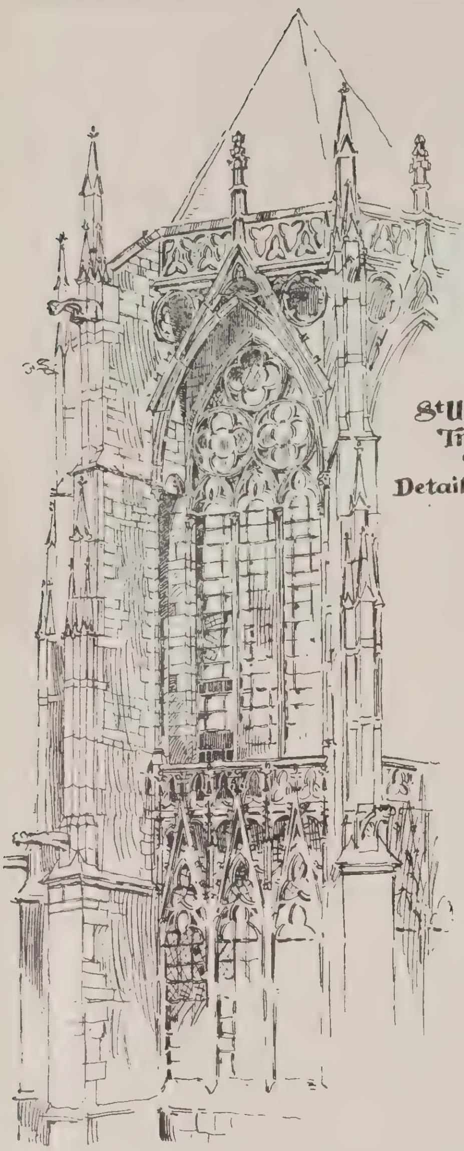
* The newest Transatlantic theory is that these settlements are interesting examples of architectural refinements, "the medieval entasis" in fact.



St Urbain
Troyes
Detail of Apse

buttresses spoil the effect. But the west front, the work of Martin Cambiche, of Beauvais, is of the best type of late Flamboyant. Most of its sculpture has been destroyed, but the detail is very rich and delicate. The Renaissance north tower has double round-headed belfry windows with big louvres. The south tower has been taken down to the level of the nave vault. The west gable of the nave stands one bay eastwards of the west front, the old west window having been replaced by an arch when the front was added in the sixteenth century.

Close to the cathedral is the church of St. Urbain, built at the cost of a native of Troyes, Jaques Pantaléon, who reigned as Pope Urban IV from 1261 to 1264. It has been much restored and its exterior is thin and spiky; this is particularly felt on the north and west sides, which have been much renewed. The south side is grey and weatherbeaten, but the scale of everything is too small to produce a really impressive result.

Structurally, the church is the most interesting in the city, and it has been very fully described by Viollet le Duc. This writer points out that the only stone quarried at Troyes is a kind of clunch, suitable only for vault fillings and wall backings. For his general masonry the builder had to use a coarse stone known as "pierre de Bourgogne" from quarries a few miles away. A third material, "pierre de Tonnerre," was imported from a considerable distance. This is a hard compact stone, obtainable in large slabs of no great thickness, and capable of being used off its natural bed. For the sake of economy this last material is used in the thinnest possible scantlings; the buttress fronts are faced with slabs of it a few inches thick and capped with slender pinnacles of the same stone. The arches of the flying buttresses, the pierced parapets, the gutters, gargoyles, and traceries are likewise formed of thin slabs, the traceries being let into grooves in the coarser masonry. Tonnerre stone is also used for the long and unusually slender mullions and for the window sills and other exposed parts of the work. It is probable that there is no masonry construction in the world which exceeds this church in lightness; for instance, the slabs out of which the window traceries are cut do not exceed eight inches in thickness. The designer's aim was to use the costly Tonnerre stone with the utmost economy, but at the same time to build a church whose vaults should be poised upon an almost unbroken clerestory.

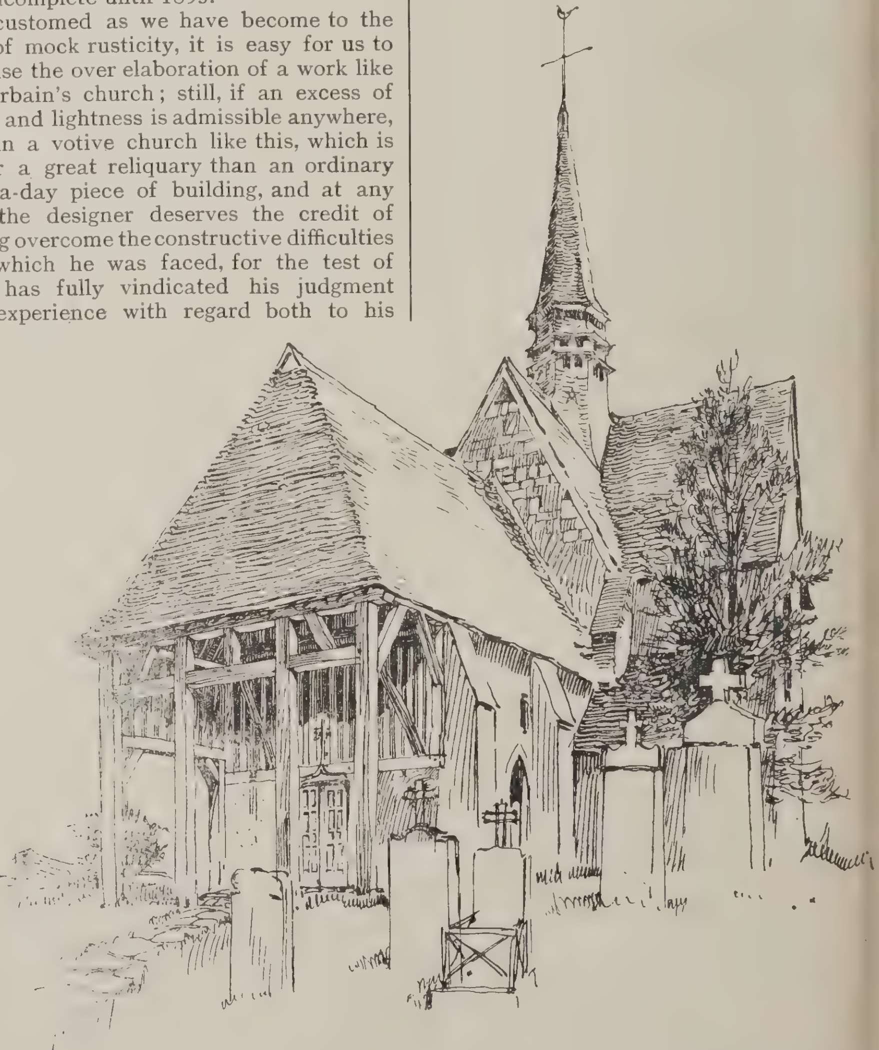
On entering the church it is surprising to find that the piers and arches are of more than ordinary solidity, but probably their massiveness contributes greatly to the dignity of the interior. It is said that the church was meant to carry a steeple at the crossing, but at present there is only an insignificant turret. The upper part of the nave is modern, the church having been left incomplete until 1895.

Accustomed as we have become to the cult of mock rusticity, it is easy for us to criticise the over elaboration of a work like St. Urbain's church; still, if an excess of finish and lightness is admissible anywhere, it is in a votive church like this, which is rather a great reliquary than an ordinary work-a-day piece of building, and at any rate the designer deserves the credit of having overcome the constructive difficulties with which he was faced, for the test of time has fully vindicated his judgment and experience with regard both to his choice of materials and his solution of the engineering problem.

The chapel of St. Gilles, a small fourteenth-century half-timbered building in the outskirts of the city, originally consisted of a simple nave with a flèche on its ridge and an apsidal sanctuary. The walls were of post and pane work with windows formed in the solid framing, the roof barrel ceiled. It is of insignificant size and its original appearance has been much altered by the addition of large transepts and a western annexe, but it is of interest as one of the few remaining timber churches in France.

Here, at Troyes, there was difficulty in obtaining good building stone, and, though the local tiles were of some repute, the use of brickwork does not seem to have become popular until the seventeenth century, and then only for domestic work. Oak timber was, however, plentiful in the district, and it is still the staple material for farm buildings in the neighbourhood; even in the city itself most of the houses are built of wood.

The nave of the cathedral was being completed during the period of depression caused by the English wars, and it is likely that this work, which was carried out in a costly and substantial style, was a heavy drain upon the resources of the faithful in the whole diocese. Moreover, during the fourteenth century the citizens of Troyes had in hand the building of the nave of St. Jean and the church of St. Remy. Both



Barbery St-Sulpice
near Troyes

of these churches would take high rank in any English town; at St. Jean's there remain the fourteenth-century nave, crossing, and south-west tower, covering an area of about 150ft. by 60ft., vaulted throughout and built with clerestory and flying buttresses in almost cathedral fashion, and St. Remy's, though on rather a smaller scale, is built upon similar lines. It is hardly to be wondered at that a chapel like that of St. Gilles, in an outlying suburb of the city, should have been built in a homely fashion and of the cheapest materials then obtainable.

Not far from the city the church in the little village of Barbéry St. Sulpice has a curious projecting wooden portico sheltering a half-timbered west front. It is a quaint little church with sixteenth-century vaulted transepts and apse, a pretty flèche, and a low barrel-ceiled nave, it contains a carved Renaissance west gallery and some good late glass. It is a little singular that most of the village churches round Troyes are vaulted, but, then, most of their vaults appear to have been set up in the prosperous years of the sixteenth century. The church building of this period is perhaps more remarkable and interesting from an architectural standpoint than anything else in Troyes.

(*To be concluded.*)

Our Plates

Inholmes, Hungerford, is being erected by Messrs. Maides & Harper, of Croydon, in brick with a tiled roof, and the electric light installation is being carried out by Mr. V. G. Middleton, of Broadway Chambers, Westminster, S.W. The house is situated about five miles from Hungerford. Mr. Leonard Stokes, F.R.I.B.A., is the architect.

Correspondence.

The Ownership of Plans.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—Frequent reference is being made to this matter in your journal and to a case decided in the English courts about 36 years ago, *Ebdy v. McGowan*, but no reference seems to be made to the well-known case decided in the House of Lords about 10 years later, the case of *Her Majesty's Commissioners of Works v. The Trustees of the late Sir Charles Barry*. In that case the whole of the plans, specifications, &c., which had been prepared for the erection of the Houses of Parliament, and upon which the usual commission had been paid, were demanded from the architect's trustees as their property, but only to be used by the Government for reference in case of alterations or reconstruction in case of fire. The case was fought out in the lower courts and finally appealed to the House of Lords, with the result that the whole of the plans, &c. (perhaps a waggon load) were ordered to be delivered up to the pursuers as their property, and for the purpose asked, but no restriction as to use was made in the order of the Court. This would become a new case and a new fight.

Following upon this decision the directors of the Bank of Scotland raised an action in the Scotch courts against the trustees of the late Mr. David Bryce, F.R.I.B.A., R.S.A., for possession of all the plans used in the erection of their head office at Edinburgh. After going some length in court the plans were given up and the case taken out of court, but no decision was given.

J. L., Clerk of Works.

DUMBARTON.

Finchley Cottage Hospital.

To the Editor of THE BUILDERS' JOURNAL.

Sir,—Mr. Saxon Snell's definition of the different terms "separation" and "isolation" as applied to wards is perfectly correct, but in the case of this competition there is no room for any doubt or discussion on the matter. Competitors were definitely required to provide an isolation ward or wards for the reception of cases of infectious fevers, and it was further required that the room or rooms for this purpose must be "aerially severed but not necessarily (although preferably) detached from the main building." Nothing could be clearer than this, and whatever the private opinion of a competitor might be he is bound to comply with the conditions or to run the risk of being disqualified.

In further reference to the question of the necessity for an isolation ward in a cottage hospital, it should be remembered that there are always two kinds of cases which could be removed under any circumstances to an isolation hospital—one is erysipelas (which needs isolation quite as much as scarlatina), the other is measles, a disease received by no public isolation hospital.—Yours faithfully,

LONDON, W.C. YOUNG & HALL.

A Reinforced Concrete System.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—In its issue of June 30th *The Builder* published a leading article entitled "The Adhesion of Concrete to Steel," in which the author, after giving his opinion on the value of the adhesion of plain bars, attacked certain statements made by the Indented Steel Bar Company in their catalogue and pamphlets. A letter was immediately sent to the Editor of that paper asking for the courtesy of space for a rejoinder. No reply was sent to this letter, and a second one shared a similar fate.

On July 18th, a letter was sent to the Editor of *The Builder* explaining the technical grounds on which the statements referred to were based, and a request was made for its insertion. This letter was returned with a curt statement from the Editor of *The Builder* declining "to insert a criticism on an opinion from a firm commercially interested in the subject."

I thereupon wrote to the Editor of *The Builder* asking him, in the interests of that fair play for which the British Press is noted, to allow us to reply, but, up to the present, no answer has been received to this letter.

May I ask if you will allow us space in your widely read publication for the insertion of this letter, which is substantially the same as that which was addressed to the Editor of *The Builder* on July 18th, and which was refused publication by him.

Had the leading article referred to confined itself to a general consideration of the subject of the adhesion of concrete to steel without mentioning the name of any commercial company, it is quite possible than an attempt on the part of our company to rush into print might be construed as an ingenious method of advertisement. In view, however, of the fact that statements made by us were attacked, it seems only fair that we should have an opportunity of defending those statements.

The writer of the article in *The Builder* commences with the statement that "there is comparatively little adhesion between concrete and a plane surface of smooth perfectly clean steel simply pressed upon its surface," and it is difficult to see how this adhesion becomes (as the writer proceeds to argue), in the case of a plain embedded bar, much greater than the shearing strength of the concrete, and indeed sufficient to pull the concrete near the rod through the surrounding mass. These statements are so inconsistent that they can only be explained by the fact that the author of the article has taken a rather peculiar view of what happens when an embedded bar is pulled out of the concrete, and support our contention that it is the unevenness and roughness of the bar that is mainly responsible for the bond. If this idea is carried a little further the value of a mechanical bond is at once apparent.

In looking up authorities to substantiate his position, the author of the article would appear not to have consulted the three latest books on the subject of reinforced concrete.

We quote from W. Noble Twelvetrees' excellent treatise :—

"The statement is sometimes made that the bond of concrete and steel is not destroyed by thermal or other stresses. There is, however, satisfactory evidence that adhesion may be overcome by interior stresses following unequal expansion of the two materials when under the influence of heat. The adhesion originally existing between the constituent parts of concrete and steel is also affected by working stresses as well as vibration and shocks such as are experienced in most structures."

He further states, in regard to the Indented Bar, that "It is of considerable merit, giving mechanical adhesion with a proportionally small quantity of metal."

In regard to adhesion he states :—

"In ordinary practice it is probably quite safe to take the value of adhesion between 250 and 500 pounds per square inch, according to circumstances."

In Buel and Hill's book the statement is made that the safe working adhesion is 60 to 100 pounds per square inch; while Taylor & Thomson say: "When the yield point of the metal is not exceeded, the minimum ultimate adhesion for first class concrete may be placed at about 275 pounds per square inch."

The example of the ½-in. rod taken by the writer of the article in *The Builder* was a fortunate selection in that the ratio of the area of the cross section to the perimeter is ¼; why was not a usual size, such as is used in large beams, say 1-in. or 1¼-in., chosen ?

Very often, even with such beams as might be reinforced with half-inch bars, it is necessary to develop the indicated stresses in a much less distance than the six feet quoted; and this is especially true when concentrated loads must be provided for. It would be interesting to have the author's opinion in the case of a beam carrying a concentrated load in the centre, in which case the stress in the bars may be assumed to increase uniformly from zero at the support to the full stress under the load (this assumption is not exactly correct owing to the position of the neutral axis not being constant throughout the length of the beam) as to whether he would consider the safe adhesion in the distance to be 500lb. times the surface of the bar, or is the 500 to be considered the maximum adhesion at the centre, in which case the total adhesion would be ½ by 500 by the surface of the bar ?

Treating briefly of Considère's results, it is certainly to be regretted that the author discussed so fully the case of embedded bars and then stated that the results are not applicable to beams. It is not often that the designing engineer has 10 feet, as suggested by the writer of the article, in which to develop the stress even in a ½-in. bar, much less a 1½-in. rod.

Referring to the specific instances quoted, we wish to treat of them separately.

Objection was made to, and doubt cast upon, the statement that plain bars were on the decrease. The objector's experience would appear to be limited by the conditions existing in his immediate neighbourhood. One cannot expect plain bars to be supplanted in countries where people are not alive to the advantages of deformed bars, much less in countries where deformed bars have not as yet been introduced. The phenomenal sales of the Indented Bars in the States is alone a sufficient answer to his criticism. The trend in Germany is also shown by the recently issued regulations requiring that the bond shall be, so far as is possible, of a mechanical nature.

The author has also overlooked the fact that the use of deformed bars has an important bearing on the cost of the building as a whole. When builders specify mixtures of 1 part cement to 2 parts sand to 3 parts gravel or even 1 : 2 : 2 mixtures in order to gain adhesion (without a corresponding increase in compressive values) when a 1 : 2 : 5 mixture should answer all requirements, if a deformed bar were used, an enormous increase in the cost of the structure, over its proper cost, results.

In regard to the action of water as affecting the adhesion between concrete and steel, the author of the article makes no mention of Breuille's experiments, reference to which was made in the text criticised, and a perusal of which would have substantiated our statements.

In regard to high unit stresses also, the article gives misleading ideas as to our practice. Our catalogue recommends generally a factor of four in the elastic limit of the steel, corresponding to a stress of about 14,000lbs. in the steel.

It is rather remarkable that our practice should be criticised when it seems to be the custom of the companies doing business here to use stresses of 16,000lbs. per sq. inch, giving only a factor of less than two on the strength of the beam.

We trust we have not trespassed too much on your space, and beg to thank you for your courtesy in allowing us the opportunity to vindicate our position.—Yours, &c.

PATENT INDENTED STEEL BAR
CO., LTD.
CECIL H. WHITTINGTON, *Director.*

The Builder of Pontypridd Bridge.—At Groeswen Chapel, near Caerphilly, a bronze tablet, designed by Mr. Goscombe John, A.R.A., has been erected to the memory of William Edwards, the builder of the famous bridge at Pontypridd and other bridges in South Wales. Edwards was a native of the parish of Eglwysilan, the son of a farmer, brought up to work on the farm. Yet he became first a builder of walls, outhouses, and cottages, and ultimately the designer and constructor of a most remarkable bridge. The fame of the Pontypridd bridge is due to its great span, the beauty of its arch, and his ingenious device for taking the weights off the centre.

Notes and News

Mr. John Adams, a builder of Lochgelly, died last week.

A Builder and Gasfittings.—At North London Police Court, John William Clark, a builder, of Church Road, Homerton, was sent to gaol for two months' hard labour, for stealing gasfittings belonging to the Gas Light and Coke Company.

The question of widening Kingston Bridge, which, since the running of electric tramcars over it, has been described as "most dangerous," was recently considered by the Joint Committee in the County Councils of Middlesex and Surrey. The committee has informed the Bridge Trustees that these councils cannot consider the subject until the trustees are ready to transfer the property relating to the bridge to the councils.

Strand to Holborn Scheme.—The London County Council last week agreed to fix its seal to the agreement, when ready, for a lease to the syndicate which has been formed for dealing with the central portion of the crescent site in connection with the Holborn to Strand improvement. If a company with a satisfactory capital is not formed in six months the agreement will be ended and the deposit of £55,000 forfeited to the Council.

An accident in Bradford occurred recently when the floor of a large room at Water Lane Dyeworks collapsed and fell into the dam below. Fortunately, no workmen were in the room at the time, those who would ordinarily have been there having a day's holiday. Some forty machines used for dyeing purposes were let down into the dam. The accident was in all probability caused by the rotting of the supports of the flooring by the water.

A Building Trade Exhibition in Newcastle.—The Newcastle Exhibitions, Limited, are organising an exhibition in the Exhibition Hall, specially for builders, decorators, and sanitary engineers. A committee has been formed of leading architects, surveyors, and contractors, who are giving the venture all the assistance possible. The idea of the exhibition is to show as far as possible everything connected with the building trade. The exhibition opens on Saturday, September 15th, and Mr. W. A. Cowle is the manager.

A Medieval Plumber in Scotland.—Some amusing details are given by Mr. Lawrence Weaver, in the August number of the *Burlington Magazine*, of the way in which plumbers worked five hundred years ago. One, William of Tweeddale, was employed to rebuild the quire of Arbroath Abbey. The most notable clause in this medieval contract provides that William shall, after the walls are parapetted, "dight" (or adorn) the work. Here are no specifications or bills of quantities, children of modern suspicion, but a large and free order to dight, and dight, doubtless, William did, though his handiwork has gone from our ken. His pay for the work was good, 25 marks (or £16 13s. 4d.), but his honour greater, for he was to get a gown and hood, doubtless a token, as Mr. Kelly suggests, of his mastership. Nor were his comforts forgotten, for daily he received a penny for his "noynsankis" "noon-shenk" or noon-drink, *vulgo* beer-money.

Enquiries Answered.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional, or legal matters.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Buildings to Measure in Northamptonshire

PORTOBELLO. — EDINBURGH writes: "Please mention any good domestic work worth measuring in Northamptonshire. Is permission to measure easily obtained?"

See an answer to an enquiry on page 362 of our issue for June 28th, 1905.

Omissions in Quantities.

DORSET writes: "I am carrying out a contract for building a house, and the bills of quantities form the basis of the contract. The job is about three parts completed and I have now discovered that there are omissions in the bills of quantities, and the ultimate cost will considerably exceed the contract sum. (There is no clause in the form of contract that the contractor has examined the plans and verified the correctness of the bills of quantities.) Considerable extra work has also been ordered and done. The architect is anxious to keep down the cost as low as possible and is apparently unwilling to admit that there is any error in his quantities, and will not certify for the full amount of money due to me under my contract. Kindly advise."

You must be quite sure you are correct. If there are extras, of course, they must be paid for and if the architect will not admit them you have a remedy at common law.

Queen Post Truss.

LONDON, N. — CONSTANT READER writes: "What is your opinion on the roof truss shown by the accompanying drawing? It is intended to carry a storage floor loaded up to 1 cwt. per super. Do you think the flitched tie beam and the other truss timbers shown are sufficient to carry the load without being supported from below? The roof trusses are at 13ft. centres. The stanchion under the end of the tie beam is employed for reasons not connected with this problem."

The frame diagram of the truss with ordinary loading is shown in Fig. 1, and Fig. 2 shows the corresponding stress diagram. The vertical weight taken is $\frac{1}{4}$cwt. per ft. sup. and the wind at $\frac{3}{8}$cwt. per ft. sup., horizontal. Some difficulty may be found in drawing the stress diagram as the amounts of the virtual forces 8–9 and 9–10 are unknown. These are due to the truss being a deformable structure and represent the bending effect on the tie beam. The method of working is as follows:—Set down the load line 1–7 and join 7–1, which will give direction of reactions and virtual transverse forces. Draw 2–11 and produce it to meet 6–15. Then draw 15–8 to cut line 7–1 in 8. Next from 4 draw a horizontal to pass through 9 on line 7–1 and 13 on 2–11. Then 14–5 giving 14 on the same point as 13; 13–12, 3–12 to give point 12; 12–11, 2–11, and finally, 11–10, which will then give the amounts of virtual forces 8–9 and 9–10. Fig. 3 shows the frame diagram with the load from floor, and Fig. 4 is the corresponding stress diagram to double the scale of Fig. 2. From the stress diagrams the maximum stresses may be obtained, viz.:—349cwt. compression in the principal rafters, 284cwt. compression in the straining beam, 40cwt. compression in the struts, 145cwt. tension in the queen post, and 308cwt. tension in the tie beam. The tie beam will also be subject to bending moments from the distributed load as shown in Fig. 5. To find the scantling of the tie beam, assume a section composed of two 10″ × 3″ and one 10″ × 4″ with $\frac{1}{2}$-in. flitch plates in between as suggested. Then W from the stress diagrams = 308cwt.; A = $(b+30t)d$ where b = total breadth of timber and t = total breadth of flitch plates, = (10+30)10 = 400 sq. in. taken as all timber; M from Fig. 5=250cwt. ft.=3,000 cwt. in.; and

$$Z = \frac{(b+30t)d^2}{6} = \frac{40 \times 10^2}{6} = \frac{4000.}{6}$$

Then

$$\frac{W}{A} + \frac{M}{Z} = \frac{308}{400} + \frac{3000 \times 6}{4000} = 0{\cdot}75 + 4{\cdot}5 = 5{\cdot}25$$

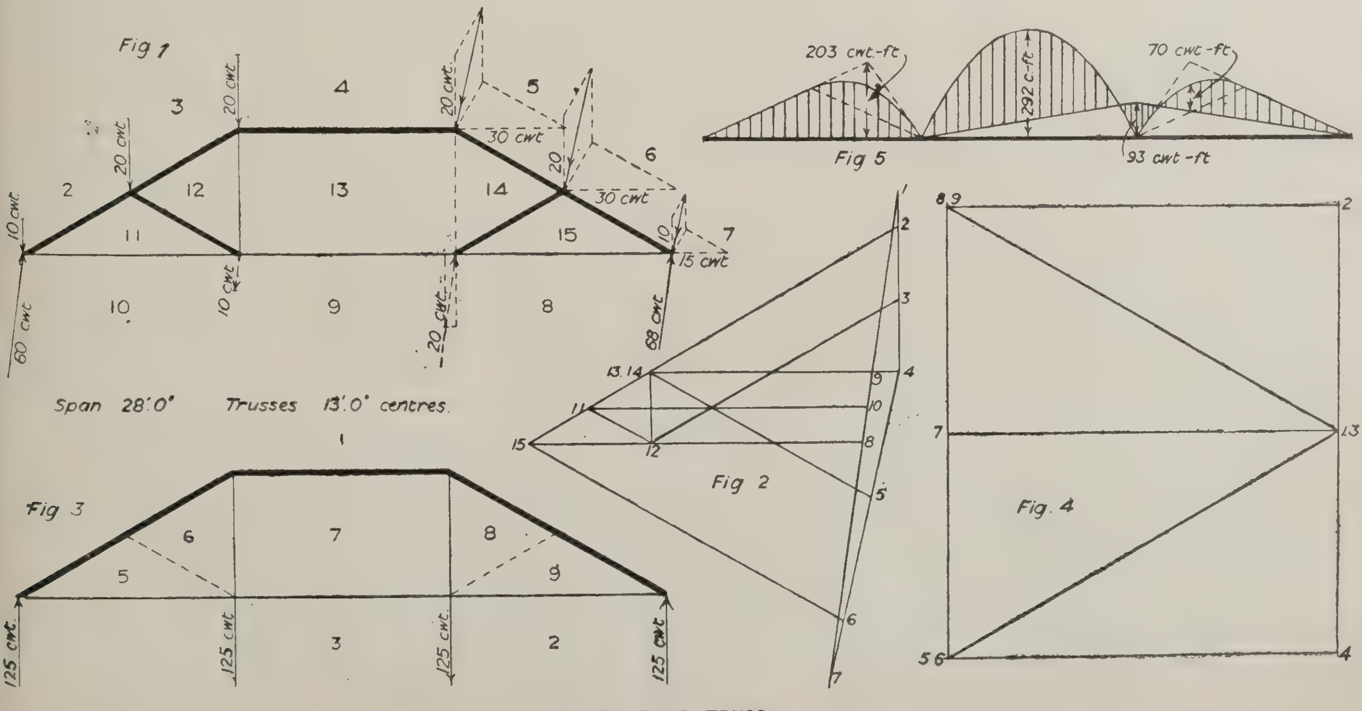
cwts. per sq. in. maximum tentile stress. The breaking weight on pitch pine may be taken as 30cwt. per sq. in. so that this section will have a factor of safety of, say, 6. The principal rafters must be made 12in. by 7in., straining beam 12in. by 7in. queen posts 9in. by 6in., and struts 4in. by 6in., and then the truss will need no intermediate supports from below.

HENRY ADAMS.

Convalescent and Nurses' Home.

FELIXSTOWE.—W. writes: "(1) What price per foot cube would a 'Convalescent and Nurses' Home' cost, the exterior of which will be, comparatively speaking, quite plain? Would 8d. be sufficient? (2) What materials would you advise to be used on the inside walls, floors, and ceilings of the ward-rooms, day-rooms, corridors, dining-room, bath-rooms, lavatories, kitchen, scullery, &c., &c.? (3) Would open fires be suitable for ward-rooms and day-rooms? (4) Is it essential that these rooms be 12ft. high from floor to ceiling, and, if so, should the w.c.'s, lavatories, and bath-room adjoining be that height also? (5) Is it necessary to have 1,440 cubic feet of space per person in the ward and day rooms, and a super. floor space of 120ft. per person?"

(1) Eightpence per cubic foot is sufficient for a building of this class. (2) This is a Convalescent and Nurses' Home and not a Hospital, therefore wood floors are all that is necessary. These would be best in deal, tongued and secret nailed. Ordinary cement plaster, sirapite or other similar material would be suitable for walls and ceilings. (3) Open fires are preferable. (4) Twelve feet is a good height for the rooms mentioned, but this height need not of necessity be retained in w.c.'s, bath-rooms, &c. (5) 1,440 cubic feet per person is excessive. With rooms 12ft. high, a floor space of 100ft. super per person is ample.



QUEEN POST TRUSS.

PROTECTIVE COATINGS FOR IRON AND STEEL.*

By Arthur B. Harrison.

Protective coatings should be divided into three classes, namely: (1) Linseed oil paints; (2) varnish and enamel paints; (3) carbon coatings, using solvents that dry by evaporation. The all-important factor in protective coatings for the preservation of steel is the efficiency, under the actual conditions of exposure as they exist, and not as they should be or as we would like to have them. In actual practice steel is seldom or never properly prepared for coating, mill scale, rust, dampness, and even dirt being more frequently covered up than removed before the coating is applied.

For a great many years this question has occupied to a great extent the minds of the leading engineers of the world, and yet up to the present time it has resulted in little but theorising and temporising, and no definite conclusions have been arrived at, except that all coatings seem to fail in time, and it has come down to one fact, that, as far as protecting the steel is concerned, the only thing to be done is to accept the conditions as they exist and make the best of a rather bad state of affairs.

It was stated by the late Edward Atkinson, of Boston, some years ago that any coating that contained

linseed oil

and dried by oxidation tended to corrode steel. It seems to me that this fact should be absolutely determined, and if after experiments, tests, and chemical analysis this proves to be a fact, it should be so stated, in order that consulting steel engineers can turn their minds into other channels, and upon the most thorough investigation in the laboratory and in the field, and under all possible conditions, find a material that when applied to steel will protect it better than any other material known. In the past, certain weaknesses have been claimed and have developed along the line of

carbon coatings ;

but if comparative results were placed in parallel columns, there is no doubt that the efficiency of carbon coatings would be found far in excess of that of paints containing linseed oil as a vehicle for a protective coating. I know that up to the present time there are certain inherent weaknesses in carbon coatings, and these weaknesses are due to the following reasons:—

There is a tendency in carbon coatings not to oxidise, for the simple reason that there is nothing in the material, generally, to oxidise. There is one reason advanced by some authorities, who seem to give great weight to it and consider it a weakness—namely, that the carbon coating fades and becomes a grey in colour, due to the action of the sun. But there is one fact which they forget, and that is that the manufacturers of carbon coatings do not claim that the material is a paint *per se*. An oil paint upon wood serves two purposes—first, as a coloured surface, and, secondly, as a protective medium, and its failure in either direction would indicate its inefficiency. A coating upon steel, on the other hand, should be simply and solely a protective coating, and the permanency of its colour is a trivial and insignificant matter.

Much scientific, technical and practical data has been given as to pigments, oils, &c.; how pigments should be pulverised to a fineness known as air-floated, ground in pure linseed oil, &c. Whereas, in practice, we find that of the pigments used in paints a great proportion would not go through a sixty-mesh sieve, much less being air-floated.

Result, Inefficiency !

Red lead has been largely used as a preservative coating for steel. In order to obtain the best results and the full efficiency of this pigment, it should be thoroughly mixed with linseed oil and kept well stirred while being applied, small quantities only being mixed at one time. This, we know, is seldom or never done. I have seen some specifications from engineers calling for one helper to stir the red lead for every two brushmen. Other specifications call for the pot of red lead to be stirred between brushfuls when being applied by the painter. This, we also know, is seldom, if ever, done.

The same applies to any paint in which the pigment is much heavier than the vehicle, the efficiency being lessened or lost in the application, in which the poor quality and kind of brush used is an important factor.

In mixing paints, I think too little attention is given by the manufacturer to compounding pigments. A pigment may be absolutely inert in itself, but when brought in combination with other pigments, chemical or galvanic action may begin, and the so-called protective paint becomes a destructive agent when applied to the metal.

A memorandum from an advertisement of one of the producers is apropos here. Many a stately building is built nowadays with

the germs of decay

imbedded in its very skeleton. Even the coatings put on the steel framework to protect it are often themselves producers or starters of decay. The importance of the steel frame of large buildings is so vital that owner and architect alike should be willing to go to any length to assure themselves of its proper preservation.

At a mill on the water-front in Brooklyn, located in the heart of the chemical district, in addition to the atmospheric conditions (being probably the most severe of any part of New York), its little quota is added to the numerous destructive gases from the battery of calcining kettles; in fact. a large portion of the mill is constantly enveloped in vapour heavily charged with sulphuric acid gas from the kettles. The result on corrugated steel roof sheathing, and, in fact, any other steel, was simply appalling, as the steel was eaten away in a very short time. We were unable to buy a paint that would protect this metal under prevailing conditions, even for a few months. As it was a case of self-preservation and protection, I started a series of investigations and tests to procure a coating that would protect. I procured samples of bitumen, hydro-carbon and asphaltum

from all over the world.

After hard work, both practical and technical, and scores of tests covering a period of years, in laboratory and in field, I selected one of these products which seemed to me to have the necessary qualifications to protect steel against corrosion under the most severe conditions.

This material is found in the West and resembles in composition and in many of its characteristics the mineral ozokenite. It is unique among deposits of mineral wax in its adaptability to the formation of a tough, impervious and extremely adhesive coating, with a high degree of elasticity; it lacks the brittleness of many of these deposits and is distinguished from all deposits of what is commonly known as asphalt, by the qualifications just enumerated.

By a special process of refining, this material can be prepared for the market with a very small percentage of residuum, grit and rock, and at the same time valuable characteristics are preserved.

It is my belief that no coating will protect steel against corrosion which is not

absolutely waterproof,

in addition to which it should have the following properties:—The bond between the metal and the coating should be perfect. It should remain elastic under all conditions of temperature, and after it has been applied for years, It should be impervious to acids and alkalies, and should resist the action of all gases. The material should be absolutely inert, and a nonconductor of electricity.

Some authorities state that corrosion of steel is due solely to electrolytic action. I believe that corrosion is greatly accelerated by the action of the electrolite, which, as we know, consists of moisture in any form, and must be acidulated or saline.

Moist air tends to impregnate and saturate an oil paint coating on steel more thoroughly than direct immersion, and after the humidity has been dispelled, the pigment in such a coating retains the moisture and holds it against the steel for many hours. Having finally dried out, it leaves a more or less porous coating, exposing the metal to all the other oxidizing elements. Mr. Wood says: "Rust begets rust, and unless rust is removed from ferric bodies, corrosion will continue even though the surface be covered with a good paint." I have experimented with the above-mentioned material on steel surfaces which were coated with rust to the thickness of from $\frac{1}{64}$ to $\frac{1}{16}$ of an inch. As you know, a large portion of this rust scale is moisture. After coating the surface on which this rust scale was, I allowed the coating to remain for thirty days and then removed the scale, and found there was no moisture left in this scale. Wet iron castings were coated with this material, first rubbing off the surplus moisture with a rag and immediately thereafter applying the coating. An examination of these coatings, months afterwards, proved that they were absolutely free from rust. Had the moisture remained on the surface of the iron, corrosion must have resulted.

After reading the statement made by the late Edward Atkinson, I took up the question of

the oxidation of linseed oil,

having made up my mind that the life of a paint depended upon the life of the oil. The results were very gratifying, because I ascertained by a long series of tests in the laboratory and in the field that I could take linseed oil, and by treating it with certain processes I could prolong the life of the oil, and its efficiency, to such an extent that paint made with it as a vehicle would resist the action of the strongest paint removers, gas drip, benzol, &c., and that a paint made with this treated oil would go over a carbon coating perfectly, without the colour striking through. The co-efficients of expansion and contraction seem to be identical.

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* Summary of a paper read before the American Society for Testing Materials.

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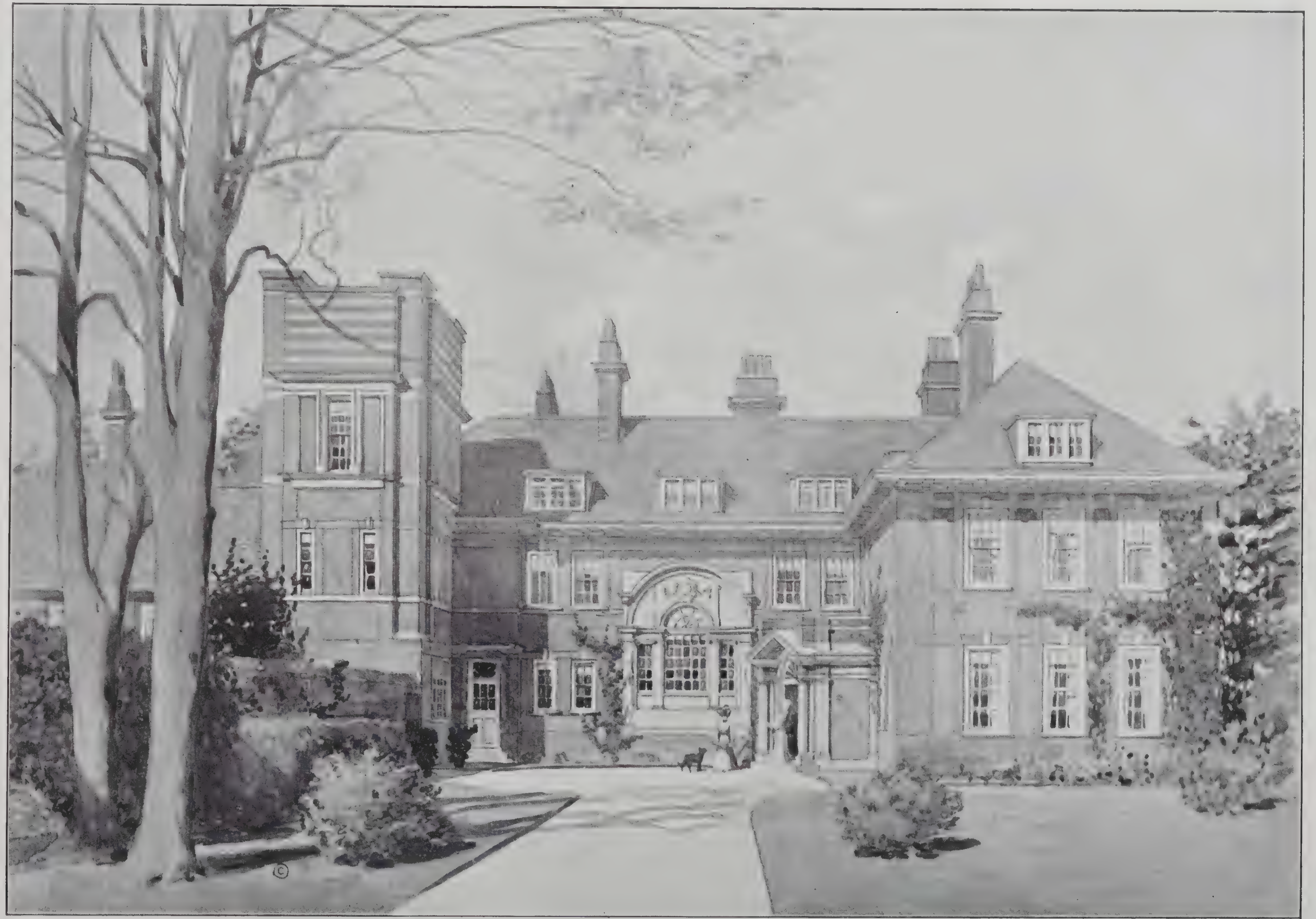

"INHOLMES," HUNGERFORD. LEONARD STOKES, F.R.I.B.A., ARCHITECT.

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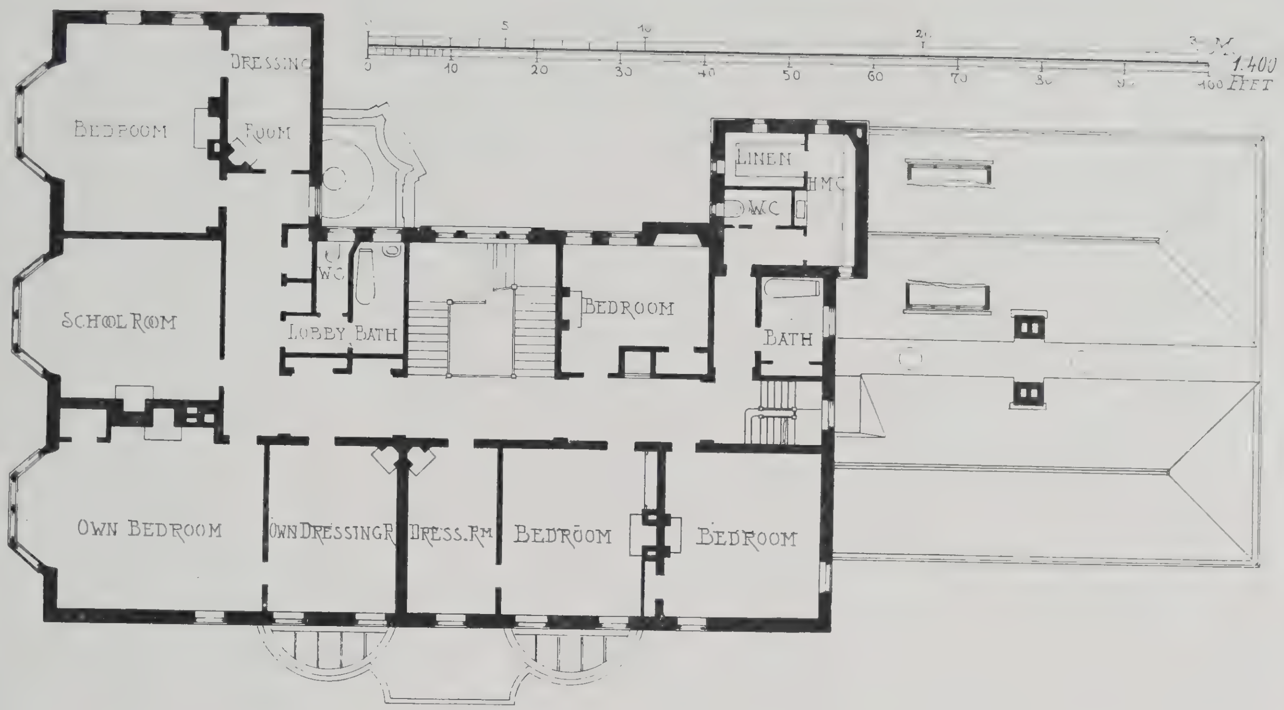
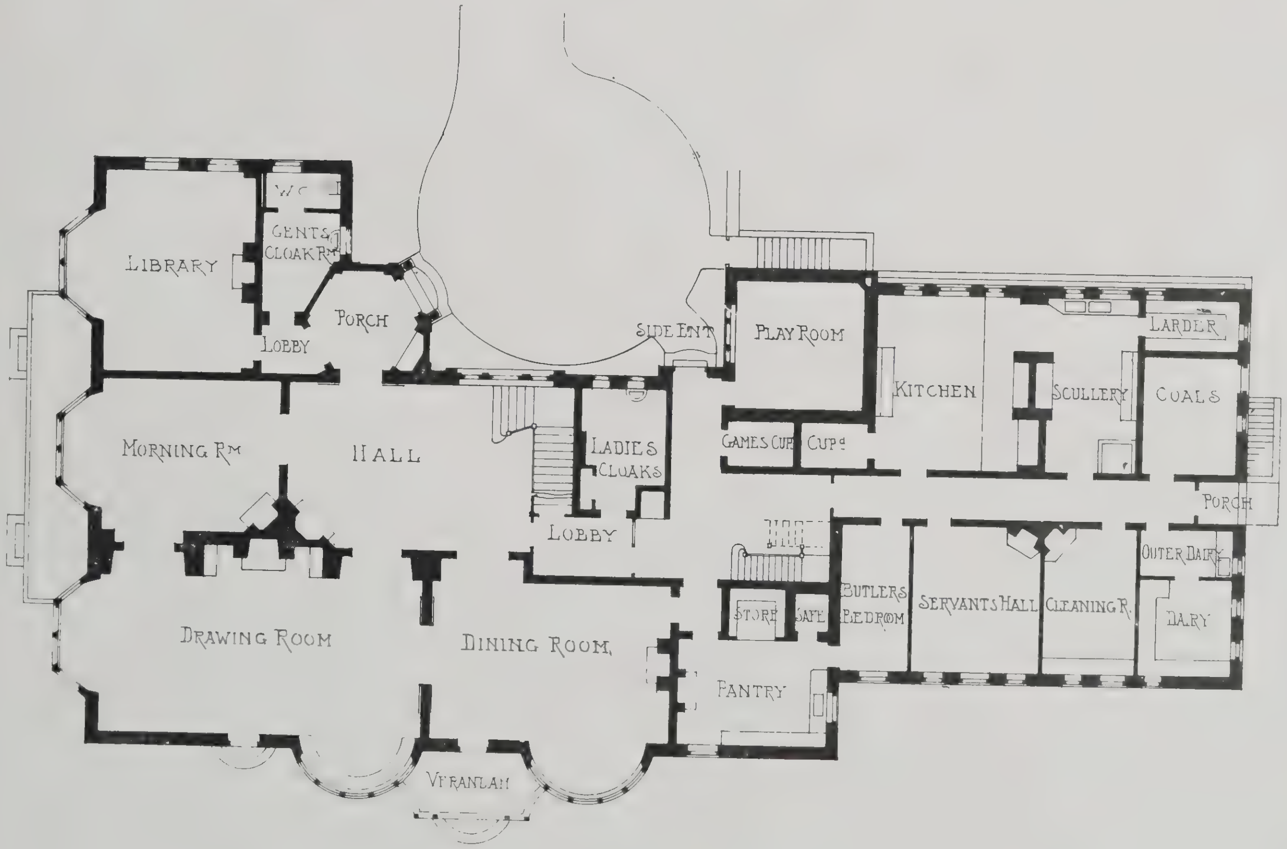


First Floor Plan.



Ground Floor Plan.

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R.I.B.A. EXAMINATIONS.

Model Answers by A. G. Bond, B.A., A.R.I.B.A.

The Intermediate Examination.

Subject V. — THEORETICAL CONSTRUCTION.

[*Time of Examination one hour and a half.*]

1. *The girder shown in sketch carries a distributed load of one ton to the foot run. Make any comments that occur to you upon the design of the girder and its supports: sketch the general alterations, if any, that you consider desirable.*

In this question, the two points that are chiefly open to criticism are—(in this case a timber beam would be out of the question):—

(*a*) The insufficiency of the depth; the makers catalogues generally suggest that the depth should be at least $\frac{1}{20}$th of the span (to avoid serious deflection), whereas in this case the proportion is

$$\frac{9}{20\times 12} = \frac{3}{80} = \text{less than } \tfrac{1}{26}\text{th.}$$

(*b*) The insufficiency of the bearing on the supports: here we cannot tell exactly the area of the bearing of the ends of the beam on the supports, but even supposing that the width of beam (a compound R.S.J.) were twice the depth—viz., 18ins.—the total area of bending would only be about $\frac{1}{2}$ft. super. at each support, and the load on each support is about 10 tons (or 20 tons per foot super.), and even supposing the bedding of the beam to be perfect and that there is no deflection, this would be excessive.

2. *How is the strength of a beam affected by alterations of* (a) *length,* (b) *width and* (c) *depth?*

In the case of timber beams of rectangular section the strength varies.

(1) Inversely as the length.
(2) Directly as the breadth.
(3) Directly as the square of the depth.

N.B.—This question could be enlarged upon by the student if time permitted, and the reasons given; for instance, in the third case it could be pointed out that on the depth depends not only *(a)* the area of fibre, but also *(b)* the "leverage" or distance of the fibre from the neutral axis —hence its two-fold value in the formula

$$w=\frac{cbd^2}{2}.$$

3. *Give any formula you know for determining the strength of one of the following:—*

(1) A Plate Girder of I section.
(2) A Rolled Steel Joist.
(3) A Rectangular Wooden Beam—and work out an example in figures.

The formula $w=\frac{cad}{2}$ might be used for both (1) and (2) and for (3), the formula given in the second answer—viz., $w=\frac{cbd^2}{L}$ Taking, for example, No. 2, the case given in Question I., and assuming the depth to be $\frac{1}{15}$th of the clear span—*i.e.*,

$$\frac{20 \times 12}{15} = 16\text{ins.},$$

we can use formula $w=\frac{cad}{L}$

$$w=\frac{20\times 5\tfrac{1}{4}''\times 16}{20}=84 \text{ tons.}$$

If 84 tons is the breaking load, the safe load may be taken as $\frac{1}{3}$rd or $\frac{84}{3}$=28 tons.

Where "w"=Breaking Load and "c"= Constant, 20 tons for distributed load. "*a*"=area of flange section (top or bottom), which can here be assumed or $5\frac{1}{4}$ sq. ins. "*d*"=16ins. (See diagram.)

4. *Explain the difference between an "Empirical" and a "Rational" formula, and state to which class belongs the formula you have given in answer to question No. 3.*

An "empirical" formula is one founded on experiment, whereas the "rational" formula is one which is based on mathematical calculation or "pure reason." The formulæ mentioned above are empirical.

5. *Make a diagram showing the stresses upon each member of a King-Post Roof Truss 24ft. span and 30° pitch.*

State the distance you assume for centre to centre of trusses, weight per superficial foot to take, in calculating the load, and what are the scales you use.

The scales for the truss and diagram are drawn under the truss diagram and by the side of the reciprocal. (See diagrams.)

Trusses, 10ft. apart.

Length of Rafter, 14ft. (approx.).

Total load, including wind pressure, may be taken for convenience as $\frac{1}{2}$cwt. per foot super.

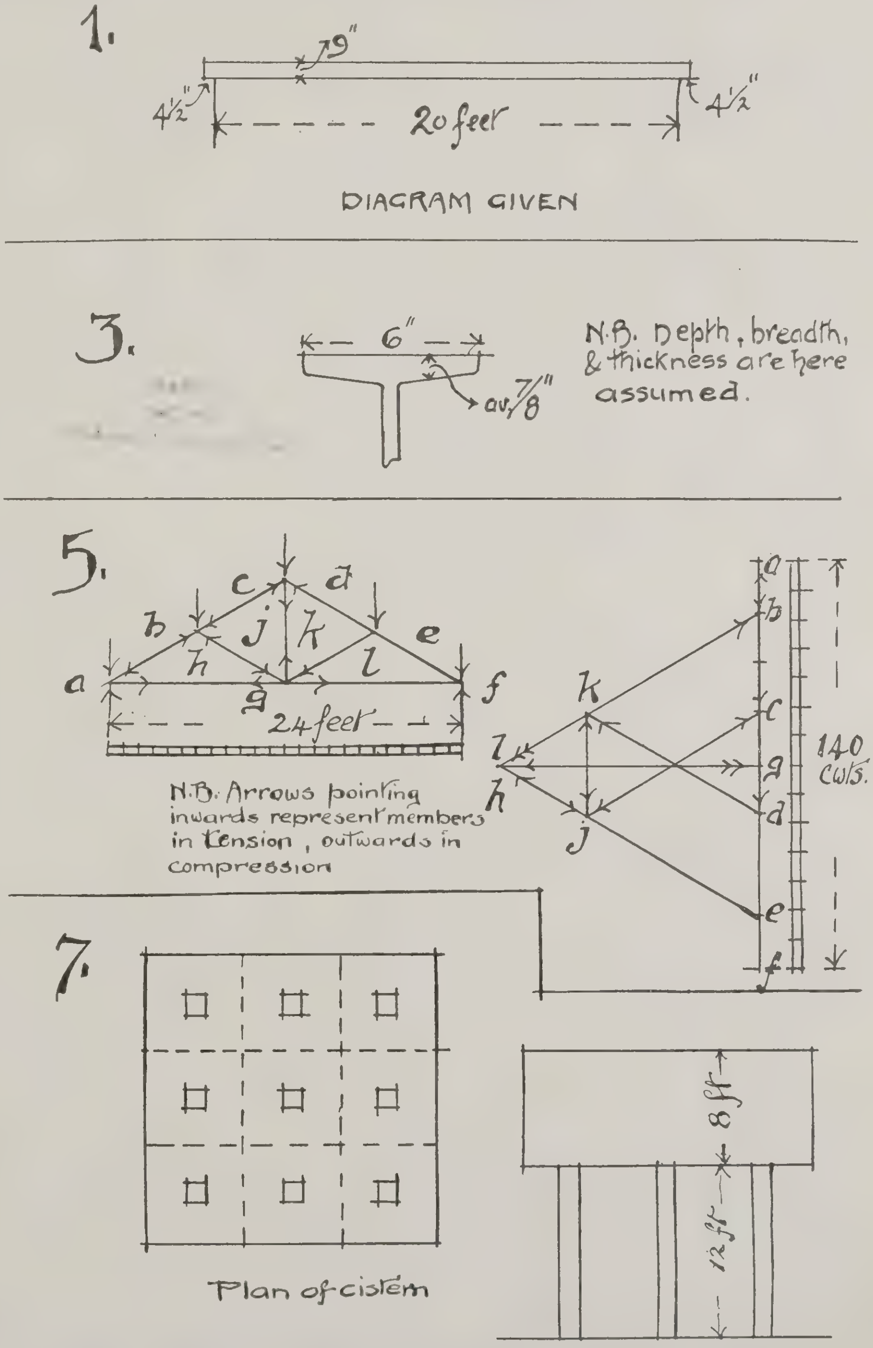
$2\times 10\times 14\times \frac{1}{2}$cwt. = total load = 140 cwt. on each truss. (The stresses on the members of the roof can be scaled from the scale line, but are not asked for.)

6. *Why is trouble sometimes experienced through the expansion of concrete in floors and flats, and what course would you adopt to reduce such trouble to a minimum?*

The expansion of concrete in floors, &c., is apt, at times, unless precautions are taken, to cause cracks or bulges in the containing walls.

It has been found that the expansion of concrete due to rise in temperature is practically the same as that of steel, hence the satisfactory working of the "ferro-concrete" principle in construction.

Another cause of expansion is inherent in the nature of cement, which, if above normal temperature, is found to expand considerably on setting. To guard against excessive expansion employ the usual expansion tests and resort to air-slaking where necessary.


1.
9"
4½"
20 feet
4½"
DIAGRAM GIVEN
3.
6"
av. 7/8"
N.B. Depth, breadth, & thickness are here assumed.
5.
a
b
c
d
e
f
g
h
j
k
l
24 feet
N.B. Arrows pointing inwards represent members in tension, outwards in compression
a
b
c
g
d
e
f
k
l
h
j
140 cwts.
7.
Plan of cistern
8 ft
12 ft

R.I.B.A. INTERMEDIATE EXAMINATION: SUBJECT V.—DIAGRAMS RELATING TO QUESTIONS 1, 3, 5 AND 7.

For large floors a judicious sub-division into sections is advisable, and some architects recommend the use of feather-edge wood slips or "expansion-joints" to take up the compression caused by expansion.

When steel-concrete is used in slabs the ends may be supported only and a small space for expansion allowed at the ends; of course, precautions should be taken to see that gauging is carefully done and, if possible, that the work is carried out at a mean temperature.

7. *A cast-iron water tank 20ft. square on plan and 8ft. deep, made of metal, which may be assumed to average 1in. thick, is to be supported on 2 piers built of stock brickwork in blue lias lime mortar each 12ft. high. Give the total weight of the tank with 8ft. of water in it and the size you would make the several piers.*

Disregard the tie-rod and flanges of the tank and also all question of necessary girders.

The position of the piers is here made such as to give each approximately equal loads. (See diagram.)

It is assumed that the tank has no top to it and that it is built of cast-iron plates, weighing 37½lbs. per foot super.

$$\text{Sides}\quad \frac{4\times 20\times 8\times 37\frac{1}{2}}{112\times 20} = 10\tfrac{3}{4}\ \text{tons}$$

$$\text{Bottom}\quad \frac{20\times 20\times 37\frac{1}{2}}{112\times 20} = 7\ \text{tons}$$

The weight of water will be

$$\frac{20\times 20\times 8\times 62{\cdot}5}{112\times 26} = 89\ \text{tons}$$

$$\text{Total load}\quad 106\tfrac{3}{4}\ \text{tons}$$

As there are 9 piers, each will carry half of the load or approximately 12 tons. Allowing as safe load for stocks in lias lime mortar (1 to 2) ¼th of the load at which fracture commences (Hurst gives 24 tons for this) or say 6 tons per foot super. we need in each pier $\frac{12}{6}$ or 2ft. super. of brickwork, which would just about be obtained by square 18in. piers, and as the height is only 8 times the width this result would be quite safe.

8. *What load per square inch would you allow in a strut of Baltic fir about 18 diameters long.*

The amount allowed would depend partly on the shape of section of the strut; for instance, a square strut would take more per sq. in. than a rectangular one.

The maximum safe load to allow when length is inconsiderable would be 15½cwts. per sq. in., but only about half of this would be generally allowed in a strut 18 diameters long.

To prove this by an example and using Euler's formula for a square strut

S=Safe load, $d=4''$, $a=15\frac{1}{2}$ cwts., L=6ft.

4″ × 4″ and 6ft. long.

$$S = \frac{a\times d^4}{L^2}.$$

$$\therefore S = \frac{15{\cdot}5\times 4\times 4\times 4\times 4}{6\times 6}$$

$$\therefore S = \frac{31\times 4\times 4\times 4.}{2\times 3\times 3} = 110\tfrac{2}{9}\text{cwts.}$$

or per sq. in. approximately $\frac{110}{16}$ = nearly 7 cwts.

9. *What is a factor of safety, and what figures would you use in dealing with steel girders and brickwork?*

A factor of safety is the number by which a breaking load is divided to reduce it to the safe load, and it depends largely on individual opinion and the circumstances of a particular case.

Generally for steel girders the manufacturers recommend that the load to be allowed for should not exceed ⅓rd of the breaking load.

Brickwork depends much on quality of materials and workmanship; generally ¼ to ⅕ of the *load at which fracture commences is regarded as safe.*

Subject VI.—Descriptive Geometry: The Projection of Solids.

(June 13th, 1906.)

Time of Examination one hour and a half. [*Not more than four questions to be attempted. Maximum number of marks 50.*]

1. *Draw to ½-in. scale a plan and elevation of twelve steps to a spiral stone staircase forming one complete turn, and indicate by a single line the position of hand-rail against the outer wall. The rise of each step is 7ins. and the diameter of the well is 4ft. 6ins.*

See illustrations.

2. *A wall 3ft. thick has an opening therein 1ft. wide on the outside and 3ft. wide on the inside, the reveals of opening being splayed. There is a semi-circular arch of 18ins. radius over the opening, and the sill of the opening is splayed inwards at an angle of* 30_o. *Draw to 1in. scale internal and external elevations and a section showing carefully the line where the splayed reveals cut the soffit of arch. Draw also the true elevation of the splayed sill.*

See illustrations.

3. *Give an isometrical drawing of the wall-plates, hip-rafters and dragging-tie at the angle of a building, the hip being 9 ins. by 2ins. and the "outer" timbers 4½ins. by 3ins.*

4. *Draw ¼-full-size the plan of the spiral end of a curtail step 12ins. on tread and indicate the position of a newel 2ins. square.*

See illustrations.

5. *A rectangular space, 12ft. by 18ft. as sketch, has a pointed stone vaulted ceiling. The height from springing of arches to crown is 10ft. 6ins. Work out the length of the diagonal and draw the true elevation of the diagonal rib.*

[*N. B. The sketch given was a rectangle 12ft. by 18ft. with diagonals.*]

See illustrations.

Subject VII. — Elementary Applied Construction: The Nature and Use of Ordinary Building Materials.

[*Time of Examination three hours. Maximum number of marks 125.*]

1. *Describe and sketch: Four joints for flooring boards, bressummer, dragon-tie, secret-gutter, soaker, throating, lap and gauge, Lewis.*

1. Floor boards are laid together in such a way as to avoid as far as possible the openings due to shrinkage, and when economy is a consideration they are (*a*) plain-jointed, the edges being shot and the boards pressed together either by folding or by means of screw cramps, or "dogs," in better work.

In higher class work the joints may be (*b*) grooved and tongued; this wastes a percentage of each board, but no actual opening is left by shrinkage and secret nailing is possible.

The waste may be minimised and the actual opening between the boards obviated by (*c*) rebate and fillet joints, another advantage of which is that they allow the maximum wear of boards before the fillet is reached, but secret nailing is not possible.

In the dowelled floors (*d*) secret nailing is possible through the outer sides of each board as it is laid, but as the opening of joints is not prevented by this method it should be used only for hardwood floors or boards in very narrow widths. (See sketches.)

2. *Bressummer*, or breast summer, is a beam used for carrying a "breast" or wall, Such beams are frequently used over shop-fronts and are subject to certain regulations and by-laws as to their distance from centre of a party wall and the bearing at each end. No sketch is needed here.

3. *Dragon-tie* or dragging-tie, a piece of construction used at the angles of buildings where the hip is used as a half-truss to carry a portico, in conjunction with the angle-brace into which it is tusk-tenoned: its other end is halved over the angle-brace and it is morticed to receive the foot of the hip-rafter. (See sketch.)

4. *Secret Gutters* are used at the sides of skylights and in similar situations to conceal the lead dressing, and on the backs of hips and turret angles where the effective appearance of close cutting is desired in the slates or other covering. (See sketches.)

5. *Soaker.* Pieces of lead worked in between slates as they are laid and having one edge turned up under a cover-flashing or apron. (See sketches.)

6. *Throating.* A groove cut near the outer edge of the underside of the projecting part of a sill or coping, &c., to prevent the water falling thereon from reaching the face of the wall. (See sketches.)

7. *Lap and Gauge* refer to the laying of slates. When nailed near the head, the lap is the distance between the tail of any course and the nail hole of the next course but one below it. The gauge is half the difference between the length of the slate (measuring from nail-hole) and the lap.

When nailed near the centre the lap is the distance between the tail of any course and the head of the course next but one below it, and the gauge = half the difference between lap and full slate length. (See sketches.)

8. *Lewis.* A dovetailed arrangement of pieces of iron connected together or in three separate pieces and capable of being let into a corresponding hole in worked stones so that they can be lifted withou damage and dropped into position when the Lewis can be released. (See sketch.)

2. *Where, and why, would you use the following?—Inodorous felt, pugging, cross-bridging, tile-creasing, asphalt, tar-paving.*

Inodorous felt is a bad conductor of heat, and is used under slating, &c., of roofs to preserve a more equable temperature within; it is also used on flats to prevent the projecting edges of boards from damaging the outer covering of zinc, &c.

Pugging is used between floor boards and ceiling below to stop the passage of sound from one floor to another; it may also be used between the studs of partitions for the same reason.

Cross-bridging is used between the joists of a floor when a partition is to be carried by it either at right angles or diagonally, to stiffen the joists and form a firm base for the sill of the partition.

Tile-creasing is used under the course of bricks or blocks used as a coping; it may be also used near the top of chimney stacks or at the junction of a plastered surface with a brick wall, &c., in the last case partly because it acts as a neat method of finishing the junction of surfaces and, in all cases, because, if advantage is taken of the curve of the tiles, it forms a good drip; but probably its primary use is as a damp-proof course to protect the wall below.

Asphalt is used for a variety of purposes—for *paving*, because it presents a fairly elastic, hard, and durable surface; for *roofing*, because it is impervious to moisture. In addition to the reasons just given, for *damp-proofing*, because, in the form of "mastic," it can be melted and poured into a cavity or laid on as an elastic sheeting, such as Callender's.

Tar-paving may be regarded as a substitute for asphalt-paving, and used primarily because it is cheaper than, and in many cases is equally serviceable with, asphalt.

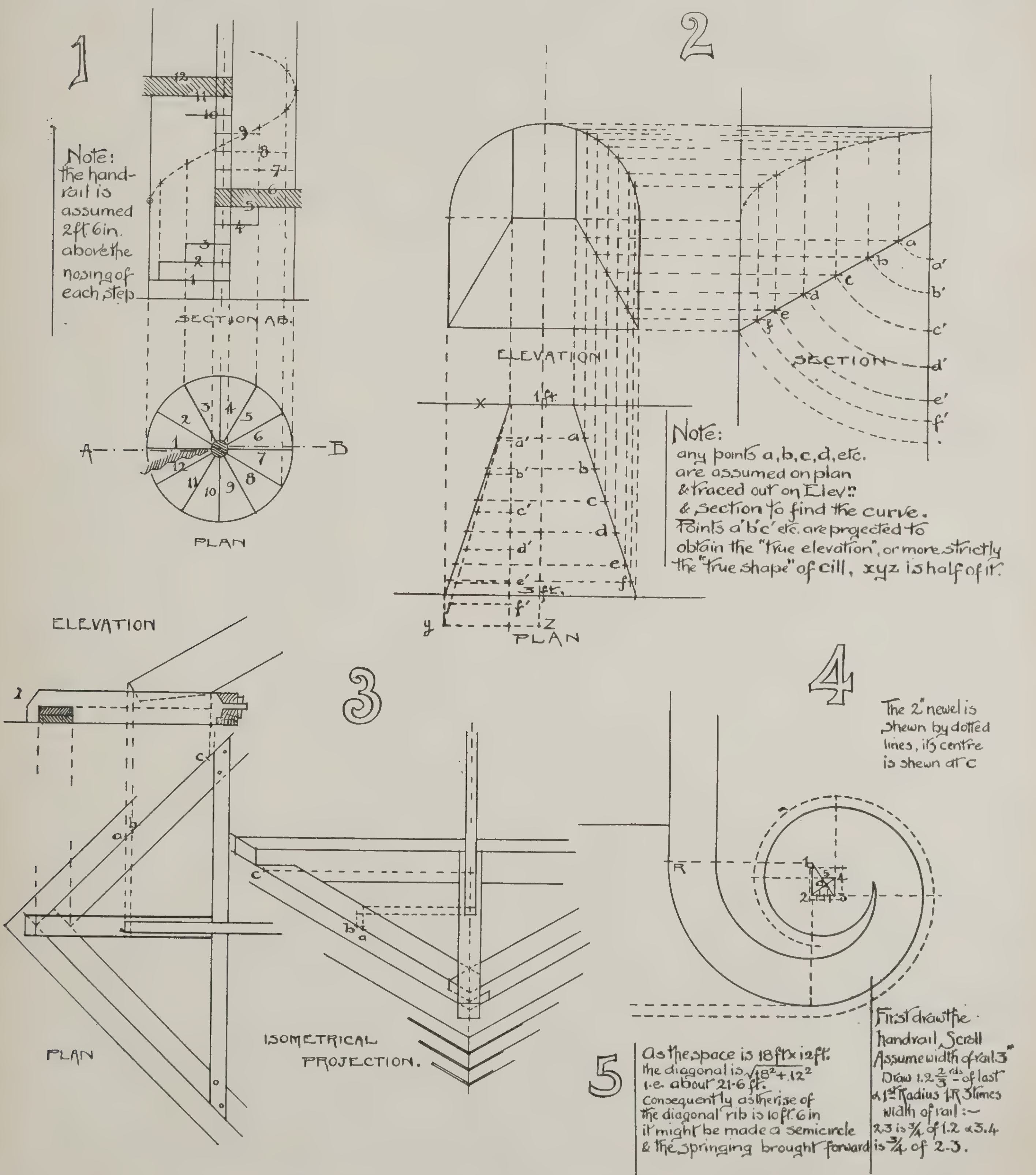
3. *What materials would you consider best for the following? and give your reasons concisely.—A drain under a house, fire-proof partition, a wall to carry heavy loads, soil-pipe. Give, in order of merit, the three different sub-soils you consider best for building on.*

Drains under a house are best constructed of cast-iron pipes treated with one of the usual protective coats (Angus Smith's solution, &c.). They are practically indestructible, and the fewness of the joints—as they are made in 9-foot lengths—renders them less liable to leakage. Some architects prefer stoneware entirely embedded in concrete as being less liable to corrosion.

'*Fire-proof*' *partition.*—There are many patent methods of making partitions at least 'fire-resisting,' and the materials composing them are generally chosen because of their possession of the following characteristics:—

1. Non-liability to disintegration under great heat.
2. Comparatively small *expansion* under heat.
3. Comparatively small *contraction* when suddenly cooled by water.

Materials possessing these qualities to a considerable degree are (1) solid timber, (2) protected iron or steel, (3) terra-cotta, (4) plaster especially if made of asbestos, (5) stock-bricks, (6) concrete (with proper aggregate), (7) slag-wool, (8) coke-breeze. These are not given in order of merit, as



Note: the hand-rail is assumed 2ft. 6in. above the nosing of each step.

Note: any points a, b, c, d, etc. are assumed on plan & traced out on Elev.n & section to find the curve. Points a' b' c' etc. are projected to obtain the "true elevation", or more strictly the "true shape" of cill, xyz is half of it.

The 2" newel is shewn by dotted lines, its centre is shewn at c

First draw the handrail Scroll Assume width of rail 3". Draw 1.2 $\frac{2}{3}$rds of last & 1st Radius 1.R 3 times width of rail:— 2.3 is $\frac{3}{4}$ of 1.2 & 3.4 is $\frac{3}{4}$ of 2.3.

As the space is 18ft x 12ft. the diagonal is $\sqrt{18^2+12^2}$ i.e. about 21-6 ft. Consequently as the rise of the diagonal rib is 10ft. 6in it might be made a semicircle & the springing brought forward

R.I.B.A. INTERMEDIATE EXAMINATION: SUBJECT VI. DIAGRAMS RELATING TO QUESTIONS 1—4.

each has certain qualities which fit it for different circumstances.

For partitions solid timber would be out of the question on account of the expense; protected steel dove-tail sheeting is a well-known form in conjunction with plaster and is strong and very economical of space; stock bricks on edge are cheap and useful, but heavier than hollow terracotta blocks, and not so economical of space—slag-wool is useful for rendering ordinary partitions more fire-resisting and forms a useful fire-proof pugging.

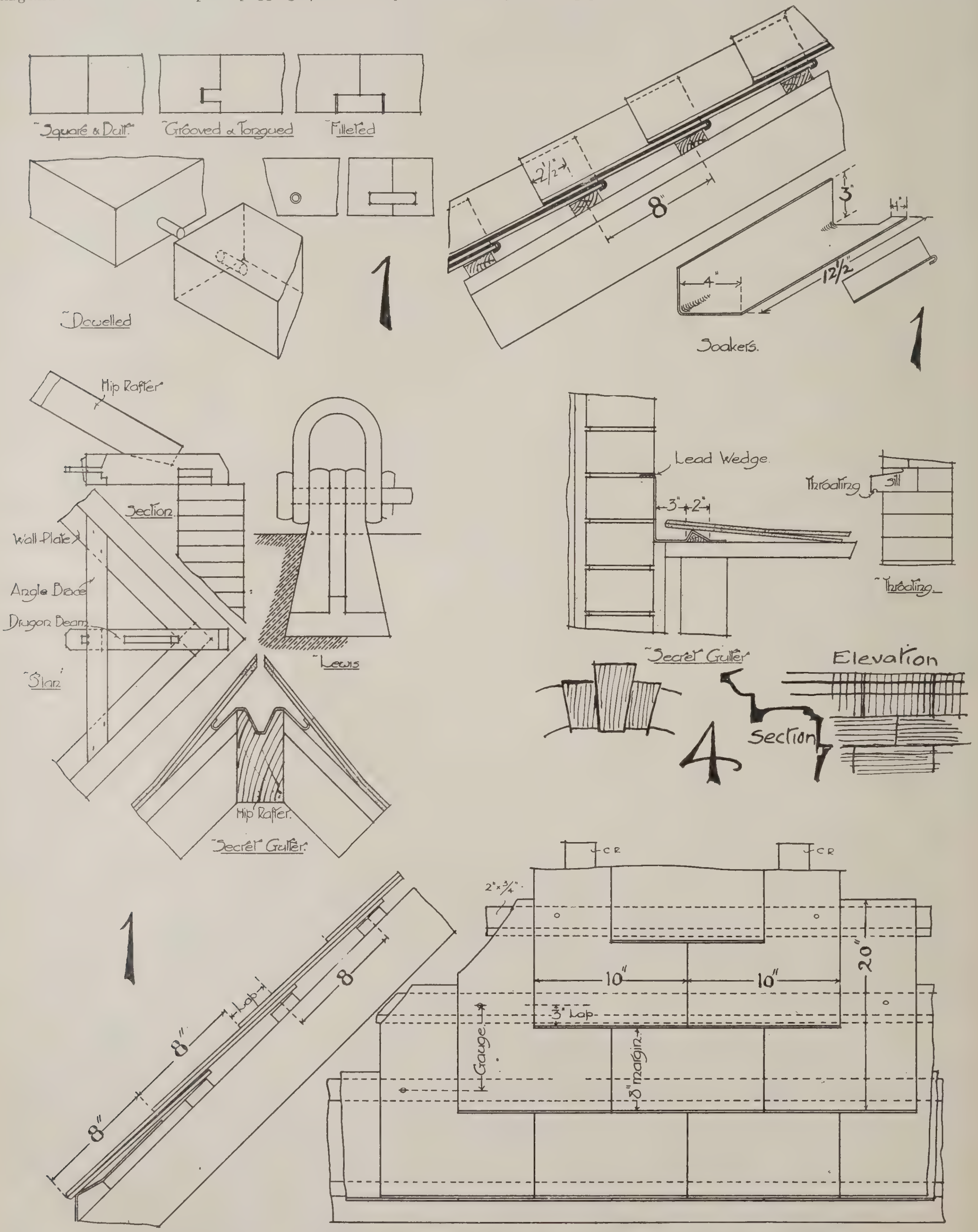
Wall to carry heavy loads.—Probably there is no material superior to Staffordshire blue bricks in cement-mortar; their strength to resist crushing when set in cement is superior to all other classes of brick.

Soil-pipes—these may be constructed either in lead or cast-iron—the latter is considered by some authorities to be superior to lead on account of its strength; lead soil-pipes need protection where a liability to blows exists, but on the other hand the joints necessary in iron-pipes are avoided, and the "wiped" joint is superior to the caulked joint as a permanent water-proof joint.

Lead soil-pipes are generally less unsightly than iron ones owing to the comparative thinness of the material used.

The qualities of sub-soil may be classed under two heads, viz.—(1) strength, (2) sanitary qualities.

Only the first need be considered in answering this question, and the strongest of all soils is *rock* or hard chalk, followed



R.I.B.A. INTERMEDIATE EXAMINATION: SUBJECT VII.—DIAGRAMS RELATING TO QUESTIONS 1 AND 4.

by gravel (which is incompressible when not liable to escape laterally). The qualities of sand and clay as a subsoil are so dependent on the actual circumstances of the case, that it is difficult to say which in a general way is the best, but sand may be excellent if confined laterally, and clay may be thoroughly unreliable if wet and slippery, and is affected by the atmosphere to a depth of at least 3ft. below the surface of the ground—whereas, if at a good depth and fairly dry it may be almost as incompressible as rock itself.

4. *Stone is specified to be laid on its quarry-bed. Give meaning of this and reason, also any exceptions you would make to this rule.*

Most of the ordinary building stones in use are "stratified" or formed by deposit beneath the ocean in layers, and naturally such stones are more capable of carrying weight when it is applied at right angles to the strata—*i.e.*, in the direction in which the material was originally compressed—than when the direction of pressure is in the same plane as the strata. From this it is easy to argue that when pressure is applied obliquely, as in the case of the voussoirs of an arch, the stones should as far as possible be placed with their strata radiating.

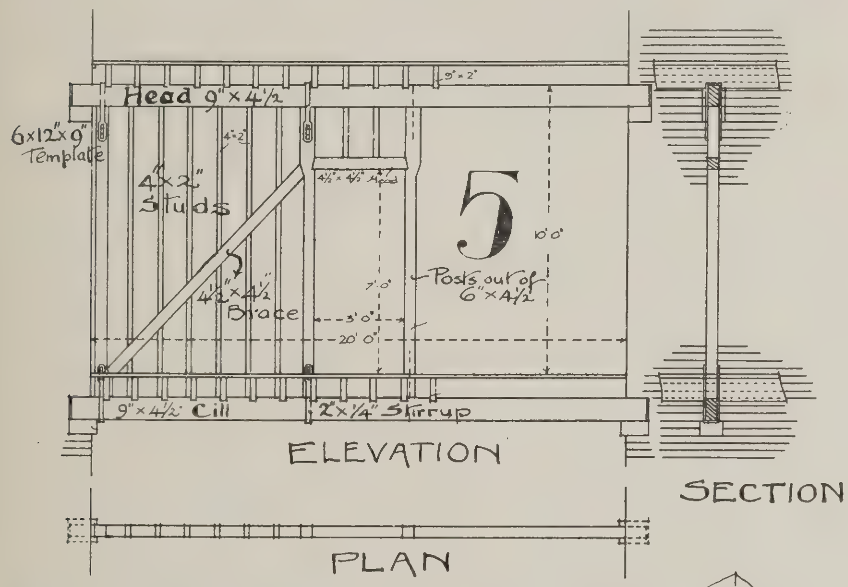
In the case of under-cut string courses, &c., it is better that the strata should be vertical and at right angles to the face of the wall, so as to obviate the flaking of the under surface when alternately saturated and frozen. The sketches indicate the direction of the strata in the various cases mentioned.

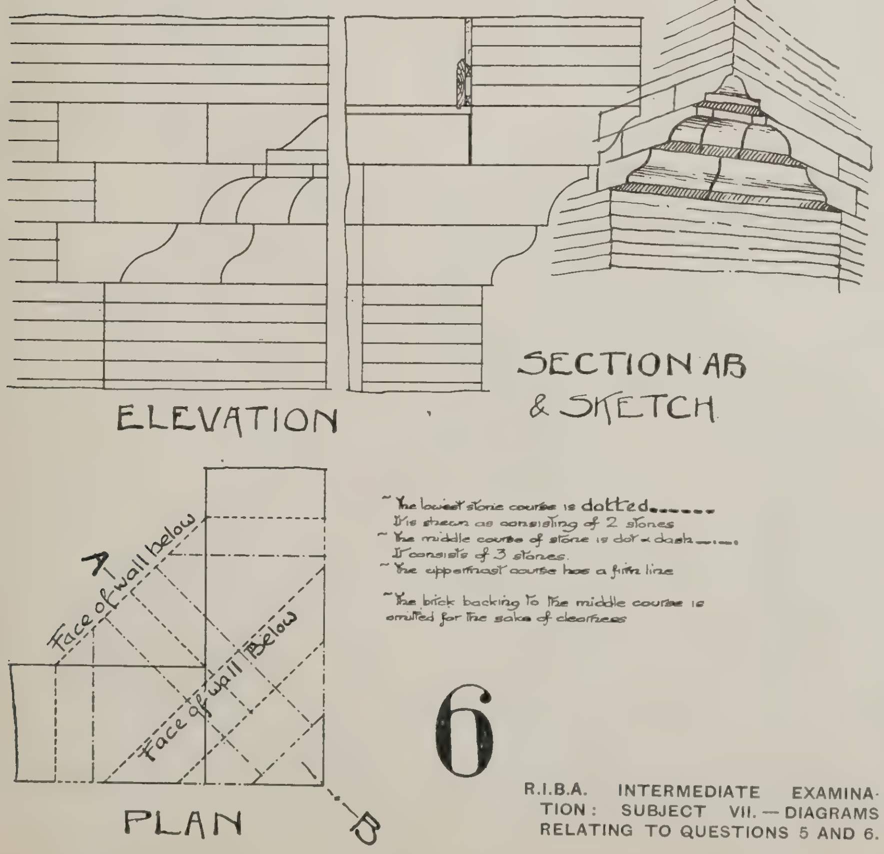
5. *Draw, to ½ inch scale, plan, elevation, and section of a framed partition, 20ft. clear span and 10ft. high, to carry floor over. There is a doorway 3ft. wide and 7ft. high in centre of partition.*

See illustrations.

6. *The angle of a building is splayed 4ft. wide and corbelled out in stone, square over. Draw plans and sections, half inch scale, shewing construction. The floor to be level with top course of corbelling, and all walls are 18ins. thick.*

See illustrations.





~ The lowest stone course is dotted.......
It is shewn as consisting of 2 stones
~ The middle course of stone is dot & dash —·—·
It consists of 3 stones.
~ The uppermost course has a firm line

~ The brick backing to the middle course is omitted for the sake of clearness

R.I.B.A. INTERMEDIATE EXAMINATION: SUBJECT VII. — DIAGRAMS RELATING TO QUESTIONS 5 AND 6.

Notes on Competitions

The New County Hall.

At last week's meeting of the London County Council the Establishment Committee reported further on the question of obtaining designs for the new County Hall. The committee stated that they were prepared to submit an estimate in respect of the fees to the assessors and competitors, but they would like to have a further opportunity of considering the question of fees to the assessors, so that they only asked the Council at present to approve the estimate in respect of the fee of 200 guineas, which it was suggested should be paid to each of the competitors, not exceeding 23, participating in the final stage of the competition. The committee hopes shortly to be in a position to submit the names of eight leading architects whom they suggest should be invited to send in designs in the final stage. Subject to the Council approving the main features of the suggested competition they proposed asking Mr. R. Norman Shaw, R.A., and Mr. W. E. Riley, the Council's architect, to draw up a schedule of requirements and detailed conditions of the competition. Having conferred with Mr. Norman Shaw, they stated that it will take some time to prepare the detailed particulars of the accommodation required by the Council and the competition conditions, and allowing 16 weeks for the preliminary and 17 weeks for the final stages of the competition, it was anticipated that suitable dates for receiving the preliminary and final designs would be May 7th and October 3rd, 1907, respectively. This report was agreed to, but in the course of the discussion Sir Melvill Beachcroft expressed the opinion that the committee did not provide sufficient information in respect to the cost of the erection. He thought this ought to be fixed definitely, so that architects should know what they might allow themselves to do by way of embellishment. He thought the County Hall should be a fine building, but he was for economy and all he wanted was a workshop. He moved the instruction to add to the recommendation that an important item which would weigh with the Council in accepting designs would be that of economy. This amendment was rejected. Sir T. Brooke-Hitching objected to the invitation of foreign architects when English architects could design such a building as the Houses of Parliament, but Mr. Verney, M.P., urged the council to throw open the competition to all the world. The chairman of the Establishment Committee said that the limit of the cost was £1,100,000.

It is refreshing to see that the press, even those papers like the "Daily News" which support progressive members of the London County Council, should generally object to the decision to invite foreign architects to furnish designs. "The Court Journal" deals with the matter from a rather novel point of view when it says: "The Council has decided to invite foreign architects to send in drawings for the competition that is to be held, and in view of the outcry there would certainly be if foreign contractors were invited to send in tenders for the building, to the detriment of the British workman, the Council evidently has peculiar ideas of the amount of consideration due to rich and poor."

Mr. William Woodward, F.R.I.B.A., F.S.I., writing to "The Standard" with reference to the subject, expresses his agreement with Mr. Horace T. Bonner, whose letter we referred to in our issue of last week, that every competitor should be placed upon an equal footing. He equally objects, with Mr. Bonner, to what he calls "the forcing of our Institute upon the attentions of the London County Council." He thinks that the perfectly fair course to adopt is to allow all British architects to compete in the preliminary competition; then to select from that a certain number to compete in the final struggle. It would be manifestly unjust to allow men who have dubbed themselves 'eminent architects' (nobody else has) to step in, and, perhaps, annex the best ideas of the 'uneminent' strugglers for fame, receive the 200 guineas for the operation, and then get before the assessors with all the ballast they can provide to assist them." Finally, Mr. Woodward adds that he sees no reasonable objection can be taken to the constitution of the assessors.

Model Cottages for Warwickshire.

Miss Edith Bradley, warden of the women's horticultural instruction centre at Providence House, Bredons Norton, announces that with a view to erecting some model cottages on her estate, Miss Z. M. Woodhull wishes to offer two prizes for the best and most suitable model (plaster or wood) of—(*a*) a detached cottage (brick or stone), to cost £300 to £400 when erected, site being given; (*b*) a pair of cottages to cost from £500 to £600. Each cottage must contain three bedrooms and bath-room, living-room and parlour, kitchen, scullery, and offices. The first prize is £15, the second £10. As an undertaking will be given that the cottages will be erected at Bredons Norton, after the two prize models, within six months after the Agricultural, Market Gardeners' and Cottagers' Industrial Show for Bredons Norton and District on August 21st, at which the models must be exhibited, the competition is worthy of attention.

Bethania Church, Maesteg.

Bethania Church, Maesteg, require plans for the extension of their hall and chapel. So commences an announcement in the local papers addressed "To Architects." The plans, *with terms for carrying out the work*, are to be sent in not later than the 18th inst. The first announcement did not appear until the 21st ult. This interesting competition is for extensions of Bethania Hall and Chapel (Baptist) and is being conducted on those strictly economic lines which seem to belong inevitably to works of this description. There are no conditions worthy of the name. Some of the requirements are stated in writing upon a sheet of note paper, others are to be explained upon the ground. It is evidently intended that the architectural treatment of the exterior shall be informal, for "the front is to be taken down and rebuilt in rock work with two or three entrances, *No Tower*." There is no professional assessor, no premiums, no undertaking that the author of the selected design will be entrusted with the work, and no statement of cost. The best rock work design at the lowest terms will, no doubt, win; but it was hardly necessary for Bethania Church to address their advertisement to architects, and, it is to be hoped, the promoters of the competition will not be a prey to the delusion that architects have taken any part in the proceedings. The promoters have shown much wisdom in choosing the rock work style for the treatment of the designs, for this is a style which may be handled with facility by any aspirant after fame upon the lowest cash terms.

List of Competitions Open.

DATE OF DELIVERY	COMPETITION.
—	COTTAGE HOSPITAL, LYDNEY. Cost £1.000. Premiums of £5 and £2. Particulars from T. A. H. Smith, hon. secretary Hospital Commitee, Lydney, Glos.
—	MODEL VILLAGE at Brodsworth, near Doncaster, consisting of 500 cottages, club house, and shops. Design of cottages to be submitted with plan of model village, which will cover about 70 acres. Particulars from the Brodsworth Main Colliery Co., Ltd., Duckmanton, near Chesterfield.
Aug. 18	CHURCH EXTENSION, MAESTEG, Particulars from T. Rees, secretary Bethania Chapel, Maesteg, Mon.
Aug. 21	CEMETERY AND CARETAKER'S HOUSE, STEWARTON. Particulars from James Kerr, clerk to Parish Council, Stewarton, R.S.O., Aryshire.
Sept. 20	SCHOOL AT SUNDERLAND. Limited, to local architects. Premiums of £5o, £20 and £10. Particulars from John W. Moncur, borough engineer, Town Hall, Sunderland.
Sept. 21	Convalescent & Nurses' Home at Glossop. Premiums of £20 & £10. Particulars from Mr. T. W. Ellison, Town Clerk, Norfolk Chambers, Glossop.
Sept. 28	SEWAGE DISPOSAL SCHEME FOR ELLESMERE. Premium of £20. Particulars from R. E. Lloyd, Clerk to Urban District Council, Ellesmere.
Sept. 29	REBUILDING OF HENSHAW'S BLIND ASYLUM AT MANCHESTER. Limited to Manchester architects. Premiums £100, £50, and £25. Assessor, Mr. John Holden, F.R.I.B.A.
Oct 1	ALPHABET COMPETITION. Prizes of £20, £10 and £5. For particulars see "Architectural Review."

Views and Reviews.

Brick Bond.

Mr. Robert Williams has had a good deal of practice in Egypt, and he has published, for the information primarily of the bricklayers—native, French and English—in Egypt, this book on bond in brickwork. The lettering on the drawings and dimensions being printed in English, French and Arabic, it may find a vogue beyond Egypt itself. Mr. Williams refers, in his introduction, to the remains of the vast brick walls of Karnak and the extensive granaries of Thebes. These were constructed of sun-dried bricks made of Nile mud. He also reminds readers that building laws were in existence, at least, so far back as the time of Khammurabi, King of Babylon, 4,000 years ago. One of these laws directed that if the walls of a house fell and killed the inhabitant the builder of the wall should also be killed. There is no such severe law in Alexandria or in Egypt to-day. For the benefit of those architects who may have to practice in Egypt, Mr. Williams refers to a pocket book of Engineering Formulæ by Ibrahim Effendi Zaky, which is published in Arabic. This book illustrates building construction and bond in brickwork. The bricks used for the better work in Alexandria to-day are imported from Marseilles and measure 21½ by 10 by 6½ centimetres. The diagrams are drawn to a large scale and are therefore clear. Brickwork bond is, however, rather troublesome to work out from diagrams as ordinarily shown, and it would be preferable if the diagrams of different courses were printed on separate sheets of tracing paper so as to make it possible, by either laying them on top of each other or by having them bound permanently in this form, to show clearly the manner in which the succeeding courses break bond.

Notes on English Bond," by Robert Williams, F.R.I.B.A. Alexandria: Whitehead, Morris & Co. (Egypt), Ltd. London: B. T. Batsford; price 4/- net.

Current Market Prices.

MISCELLANEOUS.

		£	s.	d.	£	s.	d.
Castor Oil, French ...	per cwt.	1	10	0	1	2	0
Colza Oil, English ...	do.	1	8	6		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	15	0	2	17	0
Lead, white, ground, carbonate	per ton	16	0	0		—	
Do. red	do.	15	0	0	0	19	0
Linseed Oil, barrels ...	per cwt.	1	0	7½		—	
Petroleum, American ...	per gal.	0	0	6⅛	0	0	6¼
Do. Russian ...	do.	0	0	5⅝	0	0	5¾
Pitch	per barrel	0	9	0		—	
Shellac, orange	per cwt.	10	12	0		—	
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Town	per cwt.	1	7	6	1	8	6
Tar, Stockholm	per barrel	1	5	0		—	
Turpentine	per cwt.	2	3	4½		—	

METALS.

		£	s.	d.	£	s.	d.
Standard Copper	per ton	83	0	0	84	0	0
Do. Strong sheets ...	do.	96	0	0	97	0	0
Lead, soft foreign	do.	16	15	0	17	0	0
Do. English	do.	17	0	0	17	10	0
Do. pipes...	do.	19	15	0	20	0	0
Do. sheets	do.	19	7	6	19	10	0
Galvanised Corrugated sheets	do.	12	10	0	12	15	0
Spelter G.M.	do.	26	5	0	26	10	0
Angles, Scotland	do.	7	0	0	7	2	6
Bars, do.	do.	7	17	6	8	0	0
Marked bars, Staffs. ...	do.	8	10	0	8	12	6
Common bars do. ...	do.	6	7	6	6	10	0
Angles, M'boro.	do.	6	10	0	6	15	0
Joists do.	do.	6	5	0	6	10	0
Angles, Midlands	do.	6	15	0	6	17	6
Joists, Midlands	do.	6	17	6	7	0	0
Girder plates, Midlands ...	do.	7	10	0	7	12	6
Angles, Foreign, c.i.f. Thames	do.	6	7	6	6	10	0
Tees do. do. do.	do.	6	10	0	6	12	6
Joists, Foreign, c.i.f. Thames	do.	6	2	6	6	5	0
Channels do. do. do.	do.	6	7	6	6	10	0
Plates do. do. do.	do.	6	15	0	7	0	0
Tin, Foreign	do.	169	0	0	170	0	0
Do. English ingots ...	do.	169	0	0	170	0	0
Zinc, sheets, Silesian ...	do.	30	10	0	31	0	0

TIMBER.

SOFT WOODS.

		£	*s.*	*d.*	£	*s*	*d.*
Deals, Archangel, Yellow, 2nd, 3×11	per std.	14	0	0		—	
Do. do. do. do. 3×9	do.	12	10	0		—	
Do. do. do. 3rd, 3×11	do.	9	15	0		—	
Do. do. do. do. 3×9	do.	10	5	0		—	
Do. do. Yellow (Tchovdinoff's) 3rd, 4×11	do.	12	10	0		—	
Do. Blankaholm, Yellow, 1st, 4×8	do.	10	10	0		—	
Do. do. do. do. 4×7	do.	9	15	0		—	
Do. do. do. do. 4×6	do.	10	0	0		—	
Do. Mesane, Yellow, 5th, 3×9	do.	9	10	0		—	
Do. Montreal, Spruce, 2nd, 3×9	do.	10	5	0		—	
Do. Onega, Yellow, 2nd, 3×9	do.	15	5	0		—	
Do. Petschora, Yellow, 3rd, 3×11	do.	10	10	0		—	
Do. Quebec, Spruce 1st, 3×9	do.	11	5	0	11	10	0
Do. do do. (dry) 2nd. 3×7	do.	9	0	0		—	
Do. do. Red Pine (dry), unsorted, 3×11	do.	8	15	0	9	0	0
Do. do. do. do. (do.) do. 3×9	do.	9	0	0		—	
Do. St. Petersburg, Yellow, unsorted, 3×8	do.	9	15	0		—	
Battens, Archangel, Yellow (Tchovdinoff's), 3rd, 1×7	do.	10	5	0	10	10	0
Do. Fredriksstad, White, unsorted, 2×4	do.	8	10	0		—	
Do. Horneborg, Yellow and White, 2×6	do.	6	5	0		—	
Do. do. do. do. 2×4	do.	8	0	0		—	
Do. Gefle, Yellow, 1st, 1½×11	do.	13	15	0		—	
Do. do. do. (planed) 2nd, 1½×11	do.	11	10	0		—	
Do, Mesane, Yellow, 5th, 2×9	do.	9	0	0		—	
Do. Sandarne, white (planed) 1st, 1¼×9	do.	11	0	0		—	
Do. do. do. (do.) 2nd, 1×9	do.	9	10	0		—	
Do. Skelleftea, Yellow 2nd, 3×4½	do.	8	15	0		—	
Do. St. Petersburg, Yellow, unsorted, 2½×5	do.	9	0	0		—	
Do. do. do. do. 2×4	do.	9	15	0		—	
Do. do. do. do. 2×3	do.	9	10	0		—	
Flooring Boards, Dal. 2nd, Dram, Yellow, unsorted, 1×7	do.	0	9	9		—	
Do. do. do. do. 1×6½	do.	0	9	3		—	
Do. do. do. do. 1×6	do.	0	11	3		—	
Do. do. Skonvik Yellow, 1st, 1×6	do.	0	11	6		—	
Do. do. do. do. 1×6	do.	0	11	6		—	
Do. do. do. do. 2nd 1×6	do.	0	10	9		—	
Do. do. Gothenburg, Yellow, 3rd, 1×7	do.	0	10	0		—	

Complete List of Contracts Open.

WITH a few exceptions, news of Contracts Open are not repeated after they have been published once in these columns, so that readers will find particulars in our previous issues of other contracts that still remain open.

Unless expressly stated to the contrary, all deposits required for bills of quantities, &c., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair-wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

August 10. Cranworth.—*Proposed alterations* to Cranworth School. Tenders are required for the above, not later than August 10. Plans and specifications may be seen at the School any day after school hours. Tenders should be addressed to the Rev. A. Tayler Hodgson, Cranworth Rectory, marked on the outside, "Tender for Alterations."

August 10. Cwm.—*Erection of a house and surgery* at Cwm, for the Ebbw Vale Doctor's Fund Committee. Plans and specification may be seen and further particulars obtained at the office of H. Waters, architect, Beaufort, Mon. Sealed tenders, endorsed "Tenders for House and Surgery," are to be in the hands of T. J. Rees, secretary, 27, Alexandra Street, Ebbw Vale, on or before August 10.

August 10. Strathspey.—*Mason, carpenter, slater, plumber and lath, plaster and concrete works of electrical power house, motor house, and men servants' house, to be erected at Dalchroy, Advie, Strathspey*, for G. F. M'Corquodale, Esq. Plans and specifications can be seen with A. Maitland & Sons, architects, or James Gilbert, Seafield Estate Office, Grantown-on-Spey, and tenders to be lodged with the architects, on or before August 10.

August 11. Aberfan.—*Erection of hall at Aberfan* for the Trustees of the Methodist Church. Plans and specifications can be seen at the office of W. Dowdeswell, architect, Treharris. Tenders, endorsed "Hall," to be sent to the Rev. Moses Davies, Aberfan Road, Aberfan, on or before August 11.

August 11. Tregavara.—*Addition to the Wesleyan Sunday School* at Tregavara, in the parish of Madron. The plans and specifications may be seen at the office of the architect, Victoria Square. Sealed tenders, endorsed "Tender for Tregavara Sunday School," to be sent to J. Caldwell, Victoria Square, Penzance, on or before August 11.

August 11. Seaford, Sussex—*Boarding house proposed to be built at Seaford*, for the Seaford West Co., Ltd. Names of intending contractors to be submitted to W. Lambe, Estate Office, Claremont Road, Seaford, from whom schedules of quantities may be obtained in due course on a deposit of £3 3s., sent to the above address, sealed and endorsed "Tender for Boarding-house," not later than August 11.

August 11. Camborne.—*Erection and completion of the proposed residence at Basset Road, Camborne*, for John Whilworth, Esq., according to plans and specification, which may be seen by appointment at the offices of S. Hill, architect, Green Lane, Redruth, from whom all particulars relating to the work may be obtained. Sealed endorsed tenders are to be sent to the proprietor, Lloyd's Bank, Camborne, on or before August 11.

August 11. Braemar.—*Executing the mason, carpenter, smith, slater, plumber, plasterer, glazier and painter works, electric light wiring and fittings, electric bells and window blinds, of proposed rebuilding of the west wing of the Fife Arms Hotel, Braemar*. The plans and conditions of contract may be seen with, and schedules of quantities obtained from Kelly & Nicol, architects, 367, Union Street, Aberdeen. Sealed tenders are to be lodged with W. Macintosh, Fife Estate Office, Banff, on or before August 11.

August 11. Whitburn.—*Erection of a new house to be built at Whitburn* on a site adjoining their Whitburn branch store. Plans may be inspected and bills of quantities obtained on application to the Secretary at the Marsden Stores, Marsden, between 2 p.m. and 5 p.m. Sealed tenders, endorsed "House, Whitburn," must be delivered at the Marsden Stores not later than August 11, addressed to the Secretary of the Marsden Industrial and Provident Society, Ltd., Marsden.

August 13. Pontlottyn.—*Erection of two houses at Farm Road*, Pontlottyn, for Messrs. Lewis & Morgan, Pontlottyn. Plans and specifications may be seen of P. V. Jones, architect and surveyor, Hengoed, via Cardiff. Endorsed tenders to be sent to him on or before August 13.

August 14. Dublin.—*Erection of a dwelling house and out-offices*, to be built at Cookstown, Tallaght, Co. Dublin, in accordance with the drawings and specification of Doolin, Butler & Donnelly, architects, Dawson Chambers, Dublin. Drawings, &c., can be seen at the architects' office. Tenders to be delivered to the architects on or before August 14.

August 15. Bishop's Stortford.—*Erection of buildings and foundation for* carburetted water gas plant for the Bishop's Stortford and District Gas Company. Copies of drawings and specifications can be btained from J. W. Portass, Gas Works, Bishop's Stortford, on payment of £1 1s. Sealed tenders ddressed to the Chairman of the Gas Company, and ndorsed "Tender for Carburetted Water Gas Buildngs," must be delivered at the Company's Office, 16, Water Lane, Bishop's Stortford, not later than August 15.

August 15. Lostock Hall, near Preston.—*Erection of a new Public Elementary School* at Lostock Hall, near Preston. The plans may be seen and ills of quantities obtained at the office of Henry Littler, ounty architect, 16, Ribblesdale Place, Preston, by payment of a deposit of £2. Tenders must be delivered efore 12 o'clock noon on August 15, 1906, sealed and ndorsed, to W. S. Woodcock, Council Offices, Bamber ridge, near Preston.

August 16. Antwerp.—*Reconstruction of the Government Bonded Warehouses*, known as the "Nord-Ancien and Nord-Nouveau." The specification ("*Cahier des charges*," No 1,144), relating to the contract may be obtained from the Hôtel de Ville, Antwerp, at a cost of 2 francs. All tenders should be sent in sealed registered envelopes, addressed "A Monsieur le Bourgmestre en l'Hôtel de Ville d'Anvers," and should reach the Hôtel de Ville not later than August 16. A deposit of £1,000 is required to qualify any tender. A copy of the specification may be seen at the offices of the Commercial Intelligence Branch of the Board of Trade, 73 Basinghall Street, London, E.C.

Aug. 17. St. Austell.—*Erecting new secondary schools* at St. Austell, according to plans and specifications prepared by B. C. Andrew, architect to the committee, Biddick's Court, St. Austell, at whose office the plans may be seen, and all information obtained. Sealed endorsed tenders to be sent to F. R. Pascoe, secretary. Education Office, Truro, on or before August 17.

August 17. Seacombe.—*Erection of public swimming baths* at the Guinea Gap, Seacombe, for the Wallasey Urban District Council. Drawings and specifications may be seen on application to W. H. Travers, engineer and surveyor, Public Offices, Egremont, Cheshire, and bills of quantities will be supplied on payment of a sum of £3. Tenders, enclosed in official envelopes, to be forwarded per post, so as to reach H. W. Cook, clerk and solicitor, Public Offices, Egremont, Cheshire, not later than August 17.

August 18. Belfast.—*Extensions to the premises of Messrs. R. Watson & Co., of Belfast, Ltd.*, of Donegall Street, according to the plans, specification, and conditions of contract to be seen of W. J. Fennell, architect, 2, Wellington Place, Belfast. Bills of quantities can be obtained from M'Carthy & Brookes, surveyors, Scottish Provident Buildings. Tenders to be sent to the architect on or before August 18.

August 21. Sheffield.—*Underground conveniences adjoining the Town Hall in Surrey Street* for the Health Committee. Specification and plans may be seen and quantities obtained at the office of C. F. Wike, C.E., city surveyor, Town Hall, Sheffield, on payment of £1 1s. Tenders, endorsed "Town Hall Conveniences," are to be sent in not later than 6 p.m. on August 21, addressed to "The Chairman and Members of the Health Committee, City Surveyor's office, Town Hall, Sheffield." A fair wages clause.

August 24. London, S.E.—*Erection of a new sorting office at Greenwich* for the Commissioners of H.M. Works and Public Buildings. Drawings, specification, and a copy of the conditions and form of contract may be seen on application to J. Wager H.M. Office of Works, Storey's Gate, S.W. Bills of quantities and forms of tender may be obtained at the under-mentioned address on payment of £1 1s. Tenders must be delivered before 12 o'clock noon on August 24, addressed to the Secretary, H.M. Office of Works, &c., Storey's Gate, London, S.W., and endorsed "Tender for Greenwich Sorting Office."

August 25. Newport.—*Additions and alterations* for the Isle of Wight County Education Committee at the Technical Institute, Newport. Plans and specifications may be seen at the County Education Offices, Newport, I.W., or at the office of the architect, 5, St. Thomas's Street, Ryde, I.W., where all information may be obtained. Sealed tenders, endorsed "Technical Institute," must reach F. G. Flux, County Education Offices, Newport, I.W., on or before August 25.

August 25. Edinburgh.—*Additions to the Royal Victoria Hospital for Consumption, Edinburgh*. Applications for schedules must be lodged with Sydney Mitchell & Wilson, architects, 13, Young Street, Edinburgh. Schedules will be forwarded as soon as they are ready, and tenders must be lodged with the architects not later than August 25.

Sept. 5. Manchester.—*Erection of the Domett Street Municipal School, Blackley, Manchester*. Plans may be seen and a copy of the bills of quantities (including specification) may be obtained at the Education Offices, Deansgate, Manchester, on a deposit of £2 2s. Tenders, on the official forms, and enclosed in the envelopes provided, must be delivered not later than September 5. Cheques to be made payable to the Accountant, Education Offices, Deansgate, Manchester.

Sept. 5. Manchester.—*Alterations and additions to the Abbott Street Municipal School, Rochdale Road, Manchester*. Plans may be seen and a copy of the bill of quantities (including specification) may be obtained at the Education Offices, Deansgate, Manchester, on a deposit of £2 2s. Tenders, on the official forms and enclosed in the envelopes provided, must be delivered not later than Sept. 5. Cheques to be made payable to the Accountant, Education Offices, Deansgate, Manchester.

ENGINEERING.

August 9. Bolton.—*Two Lancashire boilers* for the Electricity Committee of the Bolton Corporation Specification and form of tender may be had on application to A. A. Day, A.M.I.C.E., M.I.E.E., borough electrical engineer, Spa Road, Bolton. Tenders, endorsed "Tender for Boilers," to be delivered not later than 12 o'clock noon, August 9, addressed to the Chairman of the Electricity Committee, Town Clerk's Office, Town Hall, Bolton.

August 9. Cuckfield.—*Lining their existing filters* at Balcombe waterworks with bitumen sheeting protected by brick walls and concrete floor, for the Rural District Council. Specification çan be obtained at the Waterworks Office, and the work seen and particulars obtained on application to the Waterworks Manager. Sealed tenders should reach D. Rankine, Waterworks Engineer, Waterworks Offices, Haywards Heath, not later than August 9.

August 9. Painswick.—*Supplying materials and constructing a reservoir* at Painswick. Also for the providing and laying of about 9,163 yards of 6in., 4in., C.I. mains, and 1½in., 1in., and ¾in. galvanised piping, together with the necessary bends, t's, valves, &c., from Cashes Green to Painswick, Gloucestershire, for the Stroud Water Co., in accordance with plans and specifications, which may be inspected at the Company's office, 13, Kendrick Street, Stroud, on Mondays and Fridays. Tenders, to be endorsed "Extension to Painswick," are to be sent to the Secretary of the Company, 181, Queen Victoria Street, London, on or before August 9.

August 11. Stockport.—*One water-tube boiler, with superheater and stoker*, for their electricity works, Millgate, Stockport. Specifications and full particulars may be obtained on application to R. Lomax, acting borough electrical engineer, Electricity offices, Stockport. Intending contractors will be required to deposit the sum of £1 1s. for the specification, &c. Tenders, addressed "Chairman, Electricity Committee, Electricity Supply Works, Millgate, Stockport," and endorsed "Boiler," must be delivered on or before noon on August 11. Fair wages clause.

August 13. Saskatchewan (Canada).—*Suppy of all material and the construction of eight concrete piers and two abutments for a traffic bridge* over the Saskatchewan River at Battleford, Sask. About 5,000 cubic yds. of concrete will be required in the work. Address, T. J. Robinson, Public Works, Regina, Sask.

August 13. Dover.—*Constructing, delivering, and setting one Lancashire Boiler*, including the removal of two of the existing boilers, at the Waterworks, Castle Hill, Dover. The specification and form of tender may be obtained on payment of £2 2s., and the drawing and general conditions of contract inspected at the Office of W. C. Hawke, C.E., borough engineer, Maison Dieu House, Biggin Street, Dover. Tenders, endorsed "Tender for Boiler," to be sent to W. Knocker, Town Clerk's Office, Castle Hill House, Dover, on or before August 13.

August 13. Dudley.—*Supplying and laying feeder and distributor cables*. All tenders must be for the complete work as specified. Specifications, general conditions and forms of tender may be obtained at the offices of R. P. Wilson, consulting engineer, 66, Victoria Street, Westminster, on payment of the sum of £3 3s. The tenders must be sent in on the official forms and all instructions contained therein must be complied with, All tenders (endorsed Section C2, "Cables") must be addressed to the Chairman of the Electric Lighting Committee and delivered at the Town Hall, Dudley, not later than 12 noon August 13.

August 13. Winchester.—*Reconstructing Blackwater Bridge* (in brick and concrete) in the New Fores. Drawing, specification, and conditions of contract, and all other necessary information on application at the office of W. J. Taylor, county surveyor, The Castle, Winchester, between the hours of 9 a.m. and 5 p.m. (Saturdays 9 a.m. and 1 p.m.) A deposit of £3 3s. will be required for a copy of the drawing and specification, &c. Deposits must be made by cheque, payable to Hants County Council and crossed Bank of England, or particulars will not be sent. Tenders, endorsed "Blackwater Bridge," must be on forms supplied by the County Surveyor, and be delivered to H. Barber, clerk of the County Council, The Castle, Winchester, before 10 o'clock a.m, on August 13.

August 13. Dublin.—*Calorifiers, drying horses, economiser, and masonry work* in connection with the steam generating apparatus and hot water supply at the Baths and Wash Houses, Tara Street, Dublin, in accordance with plans and specification, copies of which may be inspected at the Office of the City Architect, Municipal Buildings, Cork Hill, Dublin, daily from 11 a.m. to 4 p.m., Saturdays excepted. Copies of the plan, specification, and form of tender may be obtained in the City Treasurer's Office, on lodgment of £3. Sealed tenders, addressed to the Chairman of the Public Health Committee, are to be delivered at the Office of the Public Health Committee, Municipal Buildings, Cork Hill, not later than 4 p.m. on August 13. Tenders must contain the names and signatures of two solvent sureties, willing to be bound jointly and severally with the contractor in the sum of £100 for the due fulfilment of the contract. Parties tendering will be required to agree to the conditions that no tender shall be amended or withdrawn before the expiration of a period of six weeks from the date of delivery to the Committee. as well as to the ordinary code of conditions governing Corporation contracts generally, so far as they apply to the present work. The contractor whose tender is accepted will be required to pay the cost of the deed of contract, which will be measured at £5 5s.

August 15. Leeds.—*Steam, feed-water, exhaust, overflow, blow-off, and other pipes, valves, &c.*, in connection with a steam turbo-generator of 3,000 kilowatts, for the Electricity Committee of the Leeds City Council. Copies of the general conditions, specification, and form of tender, may be obtained from H. Dickinson, Manager of the Department, 1, Whitehall

Road, Leeds, on payment of a deposit of £2 2s. Tenders must be in the form attached to the specification, and must be delivered to R. E. Fox, town clerk, Town Hall, Leeds, not later than 10 o'clock on August 15, in sealed envelopes endorsed, "Electric Lighting—Tender for Pipes, &c."

August 15. Blackpool.—*Excavation, brickwork, masonry, &c., exclusive only of steelwork, in connection with a new bridge over the L. & Y. and L. & N.W. Railway* at Lytham Road, Blackpool, for the Highways Committee. A copy of the specification, quantities, and form of tender can be obtained on deposit of £1 1s. Sealed tenders, endorsed "Tender No. 2, Lytham Road Bridge," addressed to the Chairman of the Highway Committee, care of J. S. Brodie, Town Hall, Blackpool, must be delivered not later than 10 a.m. on August 15. Fair wages clause.

August 15. Barking Town.—*The construction of Light Railways* as follows for the Urban District Council. Contract No. 1, Rails, fishplates, and bolts. Do., No. 2, Permanent-way construction. Do., No. 3, Overhead line equipment. Persons tendering are at liberty to tender for any of the contracts or for all of the contracts, but not for part only of one Contract. Copies of the specification, with forms of tender and general conditions, may be obtained of H. Hargreaves, clerk to the Council, Public Offices, Barking Essex, on depositing a cheque for £5 5s. Applicants to state the contract for which they propose tendering. The works are to be carried out in accordance with the plans and specifications prepared by Hawtayne & Zeden, consulting engineers to the Council, 9, Queen Street Place, London, E.C., where plans may be seen and from whom further information can be obtained. Fair wages clause. Tenders, sealed and marked "Tender for Light Railways," to be addressed to the Chairman of the Electricity and Tramways Committee, Council Offices, Barking Town, and to be delivered to H. Hargreaves, on or before 12 o'clock noon on August 15.

August 18. Penrith.—*Improvement of the arch of the Dyer's Beck Bridge, Lazonby, and removing and re-building about 25 roods of walling* for the Rural District Council. The Council's surveyor, Thomas Watson, Kirkoswald, will meet intending contractors on the place on August 10 & 11, at 10.30 a.m., when specifications may be obtained. Tenders to be sent to J. W. Smith, clerk, Penrith, on or before Aug. 18.

August 21. Caversham.—*Alterations to existing works and the erection of additional septic tanks and continuous filters* in connection with their Sewage Disposal Works for the Urban District Council. General conditions, specifications, bills of quantities, and forms of tender may be obtained and drawings inspected at the Surveyor's office, 11, Bridge Street, Caversham, upon receipt of a deposit of £2 2s. Sealed tenders, endorsed "Caversham Sewage Disposal Works—Contract No. 2, "must be delivered to A. J. Smith, engineer and surveyor, Council Offices, 11, Bridge Street, Caversham, not later than August 21.

August 28. Fairfield.—*Construction of a concrete storage reservoir* at Turner Lodge, Fairfield, near Buxton, to hold 4,000,000 gallons. Drawings may be seen, and copy of specification, bill of quantities, and form of tender obtained at the offices of Swann and Brady, engineers, Town Hall, Chapel-en-le-Frith, via Stockport, on payment of £2 2s. Sealed tenders, endorsed "Tender for Reservoir," to be delivered to C. Slater, Council Offices, Fairfield, Derbyshire, on or before August 28.

Sept. 1. Glasgow.—*Supply, delivery, and erection, under one contract of the whole of the machinery and accessories required for the mechanical equipment of the machinery buildings* at Shieldhall out-fall works. Specifications and forms of tender may be had on application at the office of Public Works, City Chambers, 64, Cockrane Street, Glasgow, by depositing the sum of £10 10s. Plans and drawings may be seen and further particulars obtained at the office of W. D. Hamilton, Consulting Engineer, 59, Bath Street, Glasgow. Tenders, marked outside "Tender for Sewage Disposal Machinery, Shieldhall," must be lodged with A. W. Myles, Town Clerk, City Chambers, Glasgow, on or before September 1.

Sept. 4. Lancaster. — *Proposed re-construction of steam heating arrangements* and hot water service at County Lunatic Asylum, Lancaster. Tenders to be sent by September 4th (extended date) to J. T. Cheetham, clerk and steward.

Sept. 24. Jassy—Roumania.—*Water supply and sewerage of the City of Jassy.*—The estimated cost is as follows: Water Supply: For Earthworks, Subterranean Galleries, c., 271,486.40f.; Iron Mains, &c., from the source to the City, a distance of 91 kilometres, 6,470,000.00f.; Distribution in the City, 1,159,914.79f.; for Reservoirs in the City, 646,000.00f.; Total, 8,547,401.19f. Sewerage: For Main Sewers, Gullies, &c., total, 1,887,607.20f. The works will be let in one contract only, but separate tenders must be submitted for each work, showing the percentage over or under schedule prices. A guarantee of 4 per cent. of the total value must be deposited with the tenders, and an additional 2 per cent. on the signing of the contract. Payments will be made monthly in Roumanian money, on materials delivered and works completed. Plans and specifications may be seen, and all further information obtained at the Chief Engineer's Office, Town Hall, Jassy. Tenders to be delivered on or before September 24.

Sept. 28. South Shields.—*Warming and ventilation, on the Plenum system*, of a block of four school departments, accommodating a total of 1,950 scholars, to be erected on the site of the Mowbray Council School, South Shields, subject to the approval of the plans for the same by the Board of Education and the Local Government Board. The plans may be inspected and further particulars will be supplied at the offices of Henry Grieves, A.R.I.B.A., architect, Albany Chambers, King Street, South Shields, to whom draft schemes and estimates must be delivered not later than September 28.

IRON AND STEEL.

August 10. Manchester.—*Smith and ironfounders' work required in strengthening the roof of Smithfield Market.* Drawings may be seen and bill of quantities and specification obtained at the office of the City Architect, Town Hall, upon payment of £1 1s. Sealed tenders, enclosed in the official envelope, to be delivered at the above office not later than 9 a.m. on August 10.

August 15. Blackpool.—*Supply, delivery, and erection complete of all necessary steelwork* in connection with a new bridge over the L. & Y., and L. & N.-W. Railway at Lytham Road, Blackpool. A copy of the specification, quantities, and form of tender can be obtained on a deposit of £1 1s. Sealed tenders, endorsed "Tender No. 1—Lytham Road Bridge," addressed to the Chairman of the Highway Committee, care of J. S. Brodie, Town Hall, Blackpool, must be delivered not later than 10 a.m. on August 15.

August 16. Desborough.—*Supply* of about 260yds. of 6in., 400yds. of 4in., and 120yds. of 3in. c.i. pipes, also quantity of flanged special castings for the Urban District Council. Apply Surveyor, Council Offices.

August 20. London, S.W.—*Supply, delivery, and erection complete, at the depot Queen's Road, Wimbledon, of a cart shed*, about 165ft. long by 30ft. span, with open sides, and consisting of galvanised corrugated iron roofing, steel roof trusses, and rolled steel stanchions, for the Corporation of Wimbledon. Detailed plans and specification may be inspected and forms of tender obtained on application to the Borough Engineer and Surveyor, Town Hall, Wimbledon. Sealed tenders, on the forms and enclosed in the envelopes provided, to be delivered at the Town Hall on or before noon on August 20.

No date. Swansea.—*Three pairs of steel gates, together with three pairs of direct-acting hydraulic presses* for opening and closing the same, with all necessary valves, pipes, and connections for the Swansea Harbour Trustees. Drawings may be inspected between 11 a.m. and 4 p.m. at the office of the Trustees' Engineer, A. O. Schenk, M. Inst. C.E., Harbour Offices, Swansea and copies of the drawings, specification, conditions, and forms of and instructions for tender may be obtained of T. Strick, clerk, Harbour Offices, Swansea, on payment of £5 5s.

PAINTING AND PLUMBING.

August 10. Aldershot.—*Painting* sewer ventilating columns for the Urban District Council. Specifications may be obtained from the Surveyor, Municipal Buildings, to whom tenders must be sent by August 10.

August 13. Exeter.—*Painting, &c., at No. 1, Higher Summerlands, Exeter.* Specifications may be seen and full particulars obtained at the offices of R. M. Challice, architect, 14, Bedford Circus, Exeter. Sealed and endorsed tenders must be sent to A. Snell, clerk to the Guardians, New Buildings, Castle Street, on or before August 13.

August 14. Hull.—*Painting the various properties belonging to the Hull Charterhouse Estate.* Copies of the specification can be obtained of J. Watson, Cogan Chambers, Hull, and tenders, endorsed "Tender for Painting," to be sent in to him on or before August 14.

ROADS AND CARTAGE.

August 10. Hale.—*Making-up of Ollerbarrow Road, Hale*, under the Public Health Act, 1875, and under two separate contracts for the Urban District Council. Plans and specifications can be seen, and bill of quantities and forms of tender can be obtained on the payment of a deposit of £1 1s., at the office of the Council's Surveyor, F. E. Boaz, any day during the usual office hours. Tenders and priced bills of quantities are to be received by J. G. Whyatt, Clerk to the Council, Ashley Road, Hale, Cheshire, not later than noon on August 10, in accordance with the specifications, and in envelopes which will be supplied.

August 11. Alton.—*Supply of 630 tons of Welsh (Moel-y-Gest) granite, 2-in. gauge, 45 tons of Welsh granite siftings*, to be delivered at Alton Station (L. & S.W.R.) in quantities of 35 tons per day. Delivery to commence on October 20. Tenders to be sent to W. B. Trimmer, Clerk to the Council, Alton, on or before August 11, marked "Tenders for Basalt."

August 11. South Shields.—*Constructional work and paving thereto for the carrying out of the permanent way and track*, including steel rails, points, crossings and other auxiliary work for the Boldon Lane and Hudson Street Extension of the South Shields Corporation Tramways, 3 furs. 1·20 chs. double lines, equal to about 6 furs. 2·40 chs. single track for the Tramways Committee. Copies of the specification and quantities, including conditions and form of tender, and also forms of contract can be obtained, and the general and detail drawings seen, at the office of S. E. Burgess, M.Inst.C.E., borough engineer and surveyor, Chapter Row, from whom all further information may be obtained. Tenders, on forms supplied, sealed and endorsed "Tender for Tramways Permanent Way, Boldon Lane Extension," must be delivered to J. M. Hayton, Court Buildings, South Shields, on or before 12 noon, on August 11.

August 14. Hampton.—*Making-up and paving of Warfield Road, Hampton*, for the Urban District Council. Plans and sections may be seen, and copies of the specification, bills of quantities, and forms of tender obtained on payment of £2 2s. Fair wages clause. Sealed tenders, endorsed "Tender for Private Street Works, to be delivered to the clerk, Public Offices, Hampton, Middlesex, not later than 5 p.m. on August 14.

August 14. Leeds.—*Paving and flagging of the following streets:*—Cross Flatts Crescent, Cross Flatts Terrace, Back Cross Flatts Place, Cross Flatts Place, Cross Flatts Parade, Cross Flatts Grove (top portion), Cross Flatts Drive, Westover Mount, and Back Roman Place. Also for the making of ashpalt footpaths and granite macadam roadway in Roman View, and the making of asphalt footpaths and tarmacadam roads in Roman Grove, Roman Place, and Lidgett Walk. Drawings may be seen at the City Engineer's office, Municipal Buildings. Forms of tender and bills of quantities may be obtained, and copies of the documents forming the contract inspected, on application at the Highways Office, 155, Kirkstall Road. Sealed tenders, endorsed "Tender for Private Street Works," and addressed to the Highways Committee, must be delivered at the Town Clerk's Office, Town Hall, Leeds, not later than 10 a.m. on August 14.

August 22. Watford.—*Making-up the following roads:*—Sussex Road, part III. (267yds. in length); Mildred Avenue (690yds. in length), for the Urban District Council. Plans, sections and specifications may be seen, and forms of tender obtained on application to D. Waterhouse, surveyor. Tenders, duly sealed and endorsed, "Tender for Private Street Works," to reach H. M. Turner, Clerk to the Council, 14, High Street, Watford, not later than 12 o'clock noon on August 22.

August 25. Bedwellty.—*Construction of a new road* across the Landslip near New Tredegar, for the Urban District Council. Plans and specification may be seen and forms of tender obtained on application to J. H. Lewis, Assoc.M.Inst.C.E., Council's surveyor, Blackwood, Mon., upon payment of a fee of £1 1s. The surveyor will meet intending contractors on the site by appointment. The contractor whose tender is accepted will be required to enter into a contract and bond, with two sureties, for the due and faithful performance thereof, and to pay the cost of same, amounting to £3, to include the necessary stamp duties. Sealed tenders, endorsed "Tender for New Road," to be delivered to T. J. Thomas, clerk to the Council, Bargoed, Glams., on or before August 25.

August 31. London, N.E.—*Alterations and additions to the permanent way* for the Walthamstow Urban District Council. Persons desirous of submitting tenders may obtain drawings, conditions of contract, specification, and form of tender from G. W. Holmes, A.M.I.C.E., Town Hall, Walthamstow, on payment of £5 as a deposit. The form of tender and schedule must be properly and fully filled in and enclosed with the specification in a sealed envelope, marked on the outside "Tender for Alterations and Additions to Permanent Way," and delivered to C. S. Watson, Town Hall, Walthamstow, not later than August 31. Fair wages clause.

Sept. 6. Brighton.—*Supply of dressed granite kerb and channel* as follows:—5,000ft. run 12in. by 6in. granite flat kerb; 2,000ft. run 6in. by 10in. granite edge kerb; 7,000ft. run 12in. by 6in. granite flat channel. The specification and form of tender may be obtained on application at the office of the borough surveyor at the Town Hall, Brighton. Sealed tenders, addressed to H. Talbot, and endorsed, "Tender for Granite Kerb," must be left at Town Hall before 10 o'clock in the forenoon on September 6.

Sept. 10. London, N.—*Sewering, levelling, paving, metalling, kerbing, channelling, and making good avenue mews, Briston Grove, and Warner Road* (1st section), Hornsey, for the Borough of Hornsey. Forms of tender, &c., and particulars can be obtained from E. J. Lovegrove, borough engineer and surveyor, Municipal Offices, Highgate, on any morning between 10 and 12 o'clock. Tenders must be on the prescribed form, and delivered or sent by post (sealed and endorsed), so as to be received in the Town Clerk's office by 4 p.m. September 10.

SANITARY.

August 13. Bollington.—*Construction of the sewerage of Kerridge* for the Urban District Council. The works comprise about 1,853 yards of 7-in. and 8-in. stoneware pipe sewers, together with manholes, lampholes, and other appurtenant works. Plans may be seen and quantities and form of tender may be obtained at the office of W. H, Radford, C.E,, engineer, Albion Chambers, King Street, Nottingham, on deposit of £2 2s. A copy of the plans may also be seen at the office of S. Knight, clerk, Council Offices, Bollington. Sealed and endorsed tenders to be sent in to S. Knight on or before August 13

August 14. Spain. — *Execution of drainage works*, in accordance with conditions set forth in the "Gaceta," at the upset price of 102,907 pesetas (about £3,690). A deposit of 5,145 pesetas (about £184) is required to qualify any tender. Tenders will be opened on August 14 at the "Casa Consistorial, 5 Plaza de la Villa, Madrid."

August 17. High Wycombe.—*Refuse destructor.* Forms of tender, conditions, and plan of site may be obtained on deposit of £2. Tenders, sealed, endorsed "Destructor," and addressed to Chairman of Destructor Committee, to be delivered to I. J. Rushbrooke, borough surveyor and waterworks engineer, 77, Easton Street, High Wycombe, not later than noon on August 17

August 22. Watford.—*Construction of about 570 lin. yards of 9-in. stoneware pipe sewers and stormwater drain, with the necessary manholes, &c.* Persons desirous of contracting for the work may see the drawings, form of contract, specifications, &c., at the offices of the Council, 14, High Street, Watford, between the hours of 9.30 a.m. and 1 p.m. A copy of the schedule of works (quantities) and a form of tender can be obtained at the offices of the Council. Sealed tenders, addressed to H. M. Turner, clerk to the Council, Council Offices, and endorsed "Tender for Sewerage," must be delivered under cover to him at Watford not ater than August 22.

August 25. Kirkleavington.—*Providing and laying of about 1,018 lineal yards of 6-in. sewers*, together with the necessary manholes, flushing manholes, settling tank, and laying out filtration area, and other works in connection therewith, at Kirkleavington, in the County of York, for the Stokesley Rural District Council. The drawings, specification, &c., may be seen of W. Richardson, clerk to the Council, Stokesley, R.S.O., Yorkshire, from 10 a.m. to 4 p.m. each day except Wednesday. Copies of specification, quantities, and form of tender may be obtained from Fairbank and Son, Engineers, Lendal Chambers, York, on deposit of £2 2s. Sealed tenders, endorsed "Tender for Kirkleavington Sewerage, Contract A," must reach W. Richardson, on or before 10 a.m. on August 25.

Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, *Great New Street, Fetter Lane, E.C*

Information from accredited sources should be sent to The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Attercliffe (Sheffield).—For the erection of a new sorting office at Attercliffe, Sheffield, for the Commissioners of H.M. Works and Public Buildings:—

J. E. Green	£2,960	1	8
J. Fidler Ltd....	1,640	0	0
W. & A. Forsdike	1,580	0	0
G. Longden & Son	1,475	0	0
H. Boot & Son	1,450	0	0
T. Gray & Son	1,410	0	0
Ash, Son, & Biggin *	1,345	0	0
J. Greenwood	1,342	0	0

* Accepted.

Bromley (Kent).—For certain works of sewering, levelling, paving, metalling, channelling, and making good streets known as Albert Road, Devonshire Square, and Sandford Road, for the Town Council:—

Albert Road.

G. G. Rayner, Croydon	£1,063	0	0
W. Shepherd & Sons, Teddington, S.W....	1,040	4	5
Mowlem & Co., Westminster ...	982	0	0
Fry Bros., Greenwich...	928	10	0
F. G. Porter, Leyton, Essex ...	906	1	9
Free & Son, Maidenhead	897	9	3
E. & E. Iles, Wimbledon	887	1	8
Peill & Sons, Bromley	741	18	0
Davies, Ball & Co.,* Letchworth ...	733	13	0

* Accepted.

Devonshire Square.

W. Shepherd & Sons, Teddington, S.W....	£258	12	4
G. G. Rayner, Croydon	255	17	4
Free & Son, Maidenhead	242	11	3
Fry Bros., Greenwich...	241	1	3
Mowlem & Co., Westminster ...	239	0	0
F. G. Porter, Leyton, Essex ...	228	10	8
E. & E. Iles, Wimbledon	222	19	0
Peill & Sons, Bromley	209	4	6
Davies, Ball & Co.,* Letchworth ...	195	19	6

* Accepted.

Sandford Road.

G. G. Rayner, Croydon	£1,685	13	9
W. Shepherd & Sons, Teddington, S.W.	1,625	10	3
Mowlem & Co., Westminster ...	1,516	0	0
Fry Bros., Greenwich...	1,462	12	9
E. & E. Iles, Wimbledon	1,352	4	3
F. G. Porter, Leyton, Essex ...	1,351	10	7
Free & Son, Maidenhead	1,350	14	11
Peill & Sons, Bromley	1,288	17	0
Davies, Ball & Co.,* Letchworth ...	1,258	7	0

* Accepted.

Cottingham.—Accepted for the construction of a covered concrete service reservoir at Keldgate, Cottingham, for the Hull Water and Gas Committee:—

T. C. Starkey, Hull	£23,495	7	6

Cowes (Isle of Wight).—For the construction and erection of a steel bridge over the Isle of Wight Railway, for the Cowes U. D. C., Mr. John W. Webster, engineer:—

Playfair & Toole, Southampton ...	£1,612	0	0
F. Grace, Southampton	1,600	0	0
J. Meader, Cowes	1,588	0	0
H. E. Day, Cowes	1,545	0	0
R. H. B. Neal, Ltd., Plymouth ...	1,476	0	0
W. G. Goodenough,* Cowes	1,395	15	0

* Accepted.

Hereford.—For the erection of a new rectory at Byton, Hereford, for the Rev. T. M. Newbery. Mr. Ernest G. Davies, M.S.A., architect, 7, Bridge Street, Hereford, and at Monmouth:—

W. C. Bolt	£1,300	0	0
W. Cadwallader, Knighton	1,296	10	7
Barker & Sons, Loughborough ...	1,262	19	0
Griffiths & Mantle, Presteign	1,161	0	0
C. Cooke	£1,130	0	0
R. L. Friend	1,100	0	0
W. Powell	1,069	1	6
E. W. Wilks	1,030	0	0
J. H. Davies,* Leominster	989	18	6

Rest of Hereford.

* Accepted.

London.—For the supply and fitting of a new boiler to the fire-float "Alpha," for the London County Council:—

J. I. Thornycroft & Co., Chiswick	£1,775
Stirling Boiler Co., Motherwell...	1,150
A. G. Mumford,* Colchester	1,126

* Recommended for acceptance.

London.—For the construction of an electricity sub-station at Holborn, for the London County Council:—

G. Munday & Son, London	£6,855
H. Lovatt Ltd., London and Wolverhampton	6,713
C. Wall Ltd.,* Grays	6,440

* Recommended for acceptance.

London, E.—For the erection of a school for mentally defective children at Poplar, for the London County Council Education Committee. Revised tenders on amended specification:—

Griggs & Son, Cubitt Town	£4,102	0	3
G. Parker, Peckham	3,831	16	4
Staines & Son, Great Eastern Street	3,775	10	0
R. Elvey & Son, Southend	3,679	4	0
W. J. Clemens, Stratford...	3,613	5	10
F. & T. Thorne, Isle of Dogs	3,447	6	6
J. & M. Patrick, Wandsworth ...	3,307	0	0
W. H. Hyde, Norwood Junction ...	3,202	14	0
Martin, Wells & Co., Vauxhall ...	3,266	11	9
J. & C. Bowyer,* Westow Street, Upper Norwood	3,118	10	11

* Recommended for acceptance.

London, N.E.—For works of kerbing, channelling, paving, making-up, &c., at Mount Pleasant Lane, Upper Clapton, between Upper Clapton Road and Mount Pleasant Hill, for the Hackney Borough Council. Mr. Norman Scorgie, borough engineer and surveyor:—

W. Griffiths & Co., 35-39, Hamilton House, Bishopsgate Street Without, E.C....	£1,074	9	5
G. J. Anderson, 26, North Street, Poplar, E.	1,040	8	9
T. Adams, 131, Stamford Hill, N....	1,019	8	2
A. T. Catley, 23, Lloyd Square, W.C....	1,017	0	0
G. Porter,* 2, Arthur Street, Well Street, Hackney, N.E.	986	5	7

* Accepted.

London, S.E.—For the construction of an underground convenience at Kennington Gate, for the Lambeth Borough Council. Mr. Henry Edwards, borough engineer:—

	Builders' work.				Sanitary Engineering and Plumbing.		
Doulton & Co., Lambeth, S.E.	£3,100	0	0		£306	0	0
W. M. Glendinning, Brixton, S.W.... ...	3,060	0	0	...	400	0	0
Davis, Bennett & Co., Horseferry Road, S.W.	2,880	0	0	...	248	0	0
F. Winkle & Co., Stoke-on-Trent	2,870	0	0	...	245	0	0
Higgs & Randall, Chiswick, W.	2,787	10	8	...	188	12	2
W. H. Hyde, Norwood Junction, S.E.... ...	2,545	0	0	...	328	0	0
Mellowes & Co., Sheffield	2,519	0	0	...	178	0	0
B. E, Nightingale. Albert Embankment	2,450	0	0	...	292	0	0
C. Dearing & Son, Islington, N.	2,411	0	0	...	235	0	0
G. Jennings Limited, Lambeth Palace Road, S.E.	2,402	15	9	...	311	6	0
E. Wall, Tooting, S.W.	2,300	0	0	...	286	0	0
Spencer, Santo & Co.,* 259, Warwick Road, Kensington Road, W.	2,300	0	0	...	220	0	0
G. & D. Musgrave & Co., St. Martin's Lane, W.C.	—			...	250	1	8

* Accepted.

London, S.E.—For laying 3,000 yards of water-main from Plumstead Common to Woolwich Common Reservoir, for the Metropolitan Water Board:

W. Griffiths & Co.	£1,575	0	0
Kirk & Randall	1,387	10	0
E. & E. Iles	1,250	0	0
J. Mowlem & Co.	1,237	10	0
T. Doewra & Sons	1,162	10	0
J. Aird & Son	1,100	0	0
A. E. Nunn	1,100	0	0
W. Dobson	1,087	10	0
Davies, Ball, & Co.	975	0	0
G. J. Anderson	950	0	0
T. C. Starkey...	937	10	0
T. Egan & Sons,* Manningham, Yorks	825	0	0

* Accepted.

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Brush Electrical Engineering Co.	£134,892	15	0
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C. Ford	65,910	2	2
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J. McManus, Hammersmith	£1,860
A. Leather, Wandsworth	1,584
W. Bain & Co., Coatbridge, N.B.	1,550
W. Harbrow, Bermondsey	1,479
T. J. Hawkins & Co.,* 109, Victoria Street, S.W.	1,447

* Recommended for acceptance.

Luton.—Accepted for the erection of a secondary school at Luton, for the Bedfordshire Education Committee:—A. Lewin & Sons, Albion Road, Kettering, £7,857.

Preston (Lancs.).—Accepted for the erection of a secondary school for girls in Moor Park Avenue, Preston, for the Corporation:—

T. Croft & Son, Victoria Street...	£9,381

Southampton.—Accepted for works in ferro-concrete, for the Harbour Board:—

D. G. Sommerville & Co.	£8,400

Surveyor's estimate, £8,000.

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R. C. Brebner & Co., Edinburgh ...	£6,752	6	1

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Bankruptcies.

Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—adjudication.

G. & M. T. Hill, painters, Carlisle. First meeting, O.R.'s, Carlisle, August 8, at 3.30. P.E., Carlisle C.C., August 8, at 11. R.O. July 27.

A. E. Oates, builder, South Shields, late Croft. P.E., Newcastle-on-Tyne C.C., August 9, at 11 R.O., July 23.

G. W. Barton, builder, Ashford. R.O., July 27.

R. & G. Brisley, builders and contractors, Dover. R.O., July 26.

A. Wilson, builder, Minster. R.O., July 26.

D. Berry, painter and decorator, Walkden. First meeting, O.R.'s, Manchester, August 8, at 2.30. P.E., Salford, C.C., September 11, at 10.30. R.O., July 27.

J. W. Brooks, plasterer and decorator, Eccles, R.O., July 23.

C. Chadwell, civil engineer and contractor, Blackburn. R.O., July 26.

Ralph Pownall, builder and timber merchant, Heywood. P.E., Bolton C.C., Sept. 19, at 5. R.O. July 23.

Coad Bros., builders, Finchley. Adj. July 21.

A. Levy, builder, Hornsey. First meeting, Bankruptcy Court, Aug. 8, at 12. P.E., do. Sept. 4, at 11. R.O., July 25.

W. J. Robinson, engineer, Twickenham and Richmond. Adj. July 23.

A. Pepper, carpenter and wheelwright, Fen End. R.O., July 26.

P. C. Hall, builder and contractor, Old Hill, Stafford. R. O. July 21.

J. H. Armitage, painter and paperhanger, Horbury, First meeting, O.R.'s Wakefield, Aug. 10, at 11. P.E., Wakefield C.C., Oct. 4, at 11. R.O., July 25.

Wilkinson Bros., joiners and builders, Bradford. First meeting, O.R.'s Bradford, Aug. 10, at 3. P.E., Bradford C.C., Aug. 15, at 10.

D. J. Jones, painter and decorator, Aberystwyth. R.O., July 23.

Brown Bros., builders and contractors, Pembroke Dock and Narbeth. P.E., Temperance Hall, Pembroke Dock, August 24, at 12.

G. Williams, late builder, Blaina. Liabilities, £160; assets, £30—deficiency £129.

W. Gibbs, builder and contractor, Charlwood. Liabilities, £700.

E. Mallin, builder, West Bromwich. Liabilities £1,200; deficiency, £2,200.

T. Williams, builder, Llwynypia. Gross liabilities, £513; deficiency, £383.

New Companies.

Wailes, Dove & Co. (1906), to take over the business carried on by Wailes, Dove & Co. Limited, at Newcastle-on-Tyne and elsewhere and to carry on the business of manufacturers of and dealers in enamels, solutions, tank top coverings, cements, paints, and compositions for the protection of steel, iron, stone and woodwork, &c. Capital, £70,000

New Coleshill Works Company, to acquire the business carried on by J. Swanne, at 23 and 24, Whittall-street, Birmingham, as the Coleshill Works Company, and to carry on the business of engineers, founders, &c. Capital, £2,000.

John Jones (Chelsea), to adopt an agreement with J. Jones to acquire the business carried on at the company's various branches as John Jones, and to carry on the business of engineers, builders, merchants, &c, Capital, £10,000.

Victor A. Smith & Co., to take over the business of builders' merchants carried on at Nottingham and elsewhere by a company of the same name, 3, City Buildings, Carrington Street. Nottingham, capital £12,000.

Concrete Building Co., to acquire the business carried on by J. Idiens at Evesham, Worcester, and elsewhere, to take over certain freehold land, buildings and hereditaments in Bidford, Warwick, and to carry on the business of builders, contractors, &c. Capital £10,000.

Chatburn and Co.—To acquire the business carried on as E. J. Chatburn at Harefield Road Works, Sheffield, and to carry on the business of joiners, timber merchants, &c. Capital £500.

Coming Events.

Saturday, August 11.

Northern Architectural Association.—Students' Sketching Club Excursion.

Monday to Saturday, August 13-18.

Architectural Association.—Annual Excursion.

Saturday, August 18.

Northern Architectural Association.—Visit to the Medical College and New Grammar School, Newcastle-on-Tyne.

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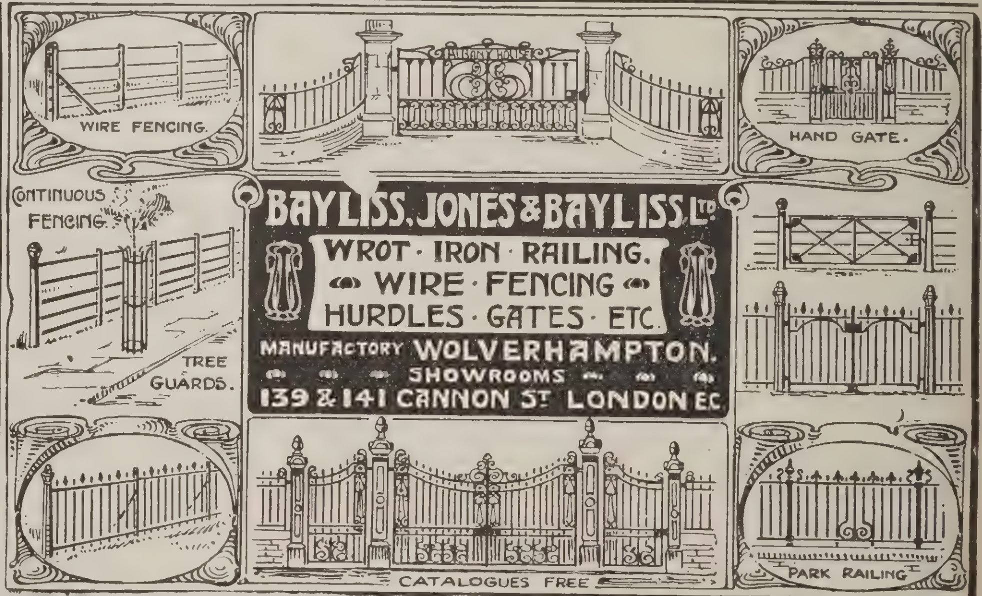
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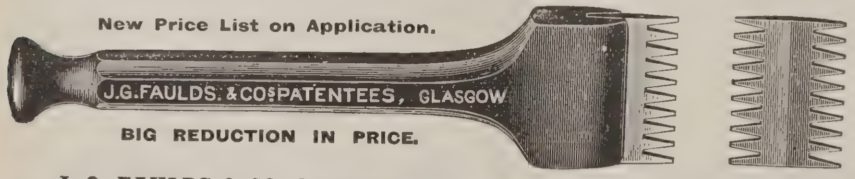

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THE BUILDERS' JOURNAL

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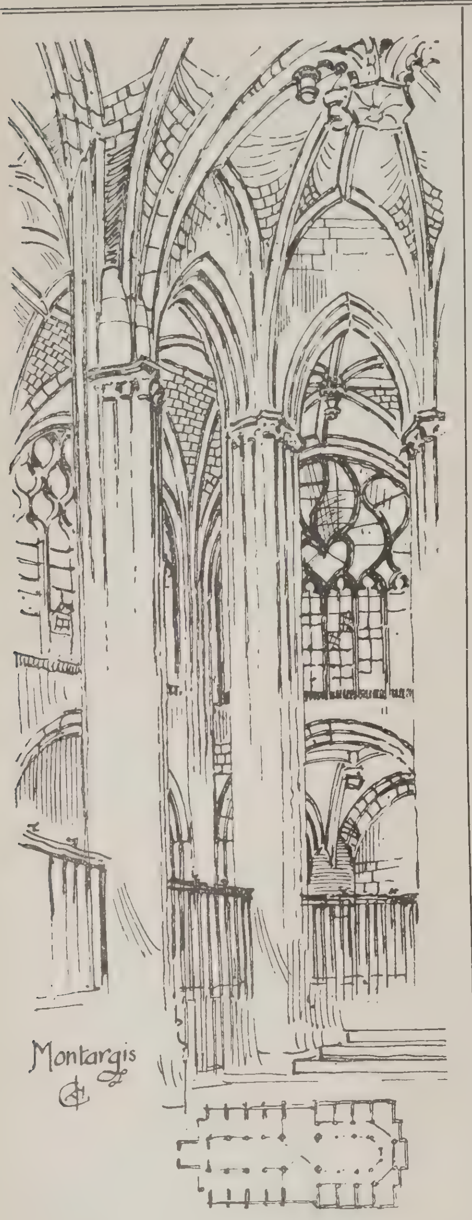
The Inner Nature of Strain. THE ultimate laws of stress and strain are subjects of interest to all concerned with construction; and, therefore, the contribution to the molecular theory of the inner structure of metals by Professor J. A. Ewing, LL.D., F.R.S.. M.I.C.E., in his presidential address to the Engineering Section of the British Association was distinctly welcome. It certainly marks an advance in the direction of a more rational understanding of the nature of the phenomena, it points the way to a simplification of the analysis of stresses and strains in structures, and it removes some of the ignorance we are accustomed to gloss over with factors of safety. Professor Ewing and Mr. Rosenhain, some years ago, showed how stresses in metals produced changes in their crystalline structure, and, working upon this line, Professor Ewing is able to state a fair working hypothesis. Briefly stated, his theory is as follows: Metals are congeries of a multitude of grains, everyone of which is a crystal, although the boundaries of each grain have none of the characteristics of geometrical regularity which one is apt to look for in a crystal, but the grain is a true crystal for all that. Its boundaries have been determined by the accident of its growth in relation to the simultaneous growth of neighbouring grains. Within each grain however, the growth is regular. Professor Ewing uses the simile of a nursery in which several children start at random piling bricks side by side, each in geometrical regularity of orientation until each pile meets other advancing piles, until the whole space is filled. The whole solid mass he conceives as containing as many grains as there have been nuclei from which the growth began. In general, quick cooling means that crystallisation starts from many nuclei, and the resulting grains are consequently small; with slow cooling a gross structure of large grains is obtained. The process of annealing consists in raising metals to temperatures at which recrystallisation may take place, though the metal remains solid while this internal rearrangement of its particles goes on. Now, when a piece of metal is strained beyond its limit of elasticity, the permanent set resulting is caused by the yielding that takes place by means of slips between one and another portion of each crystal grain. In other words, the plasticity which a metal possesses is due to the possibility of shear on certain planes in the crystal that are called "cleavage" or "gliding" planes. When metals are strained they first pass an elastic stage where there is no permanent set; beyond this they slip. Professor Ewing suggests that this may be explained by assuming the molecules of a metal to possess magnetic polarity equally in three directions defined by rectangular axes. He assumes the molecule has six poles—three positive and three negative—and that these repel the like and attract the unlike poles of other molecules. The molecules have envelopes which may turn on one another without friction. Crystal building consists, therefore, in bringing molecules into conjunction so that they shall be in a position of maximum stability under their mutual attractions. Professor Ewing showed by means of models and diagrams how molecules in a group might be displaced from the position of maximum stability and yet possess some stability. Straining action in the elastic stage, Professor Ewing suggests, is similar to displacing such systems by sliding molecules on each other a small way, insufficient to break bond. Beyond the elastic stage he suggests the molecules step forward along the plane of sliding, so producing permanent set, and in settling down again the chances are against their taking up their normal orientation. The molecular constitution of the metal in the region adjacent to a plane of slip is now uncertain and patchy, including parts whose stability is less than normal. A touch would make them tumble into positions of greater stability. This is what we find in reality—at the critical point there is a big yield which will not be stopped by reducing the amount of the straining force. A slow, creeping action continues after the straining force has done its main work, which Professor Ewing ascribes to this breaking up of the more unstable groups formed during the first stage of the slip. These unstable groups will prevent the metal recovering its perfect elasticity until it has had a long rest or been annealed. Professor Ewing also shows how the theory will account for the fatigue of elasticity when a straining action is frequently repeated. Experiments show this action to begin with slight slip on surfaces where the strain locally exceeds the elastic limit. An alternating stress makes the surfaces slip backwards and forwards sufficient to cause them to lose their crystalline grouping, and so lose the cohesion due to strict alignment of molecular polarity. He suggests that whereas in normal crystallisation each molecule touches six neighbours, under strong compelling forces the molecules may be piled up pyramidally, so that each molecule touches twelve others. This would mean that increase of density and rarification took place locally. This would account for increase of density in wire drawing and for the development of cracks through alternations of stress. Such theoretical reasoning gives us a clearer notion of strains resulting from stresses in structures. Molecular conceptions are pretty certain to be very different to reality, but we must make assumptions for the purpose of analysis, and Professor Ewing's is so simple as to suggest its sufficient accuracy as a preliminary to future investigation.



Montargis

St Remy Dieppe.

SOME NOTES ON TROYES AND ITS CHURCHES.

By C. A. N.

(PART II.)

(Concluded from page 65, No 600)

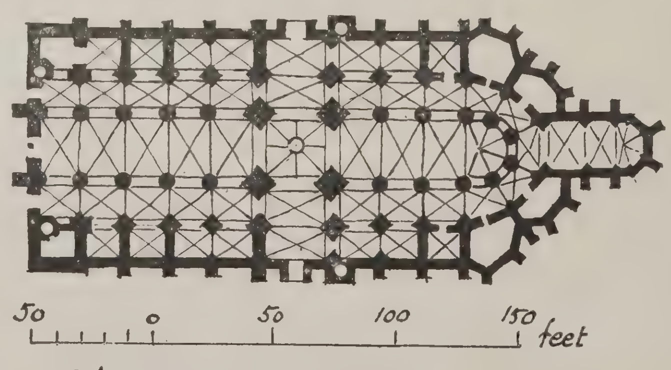
Like our own perpendicular, the Flamboyant style in the hands of a commonplace artist is very often ungraceful and capricious—it is so in many French churches both in the towns and in the villages, but in the hands of a master it may become a style of the utmost beauty and refinement, as for example, in the rood-loft of the Madeleine and the west front of the cathedral.

The choir of St. Jean and the churches of St. Remy, St. Nizier, St. Nicholas, St. Martin, and St. Pantaléon at Troyes, illustrate very completely the transition from Flamboyant to Renaissance ideas in this particular part of France, where Gothic traditions died hard. Here we have in St. Martin's a church begun upon essentially Gothic lines in the middle of the sixteenth and completed, according to the original designs, in the seventeenth century, while even the eighteenth-century clearstory of St. Pantaléon is far more Gothic than Classic in all essentials.

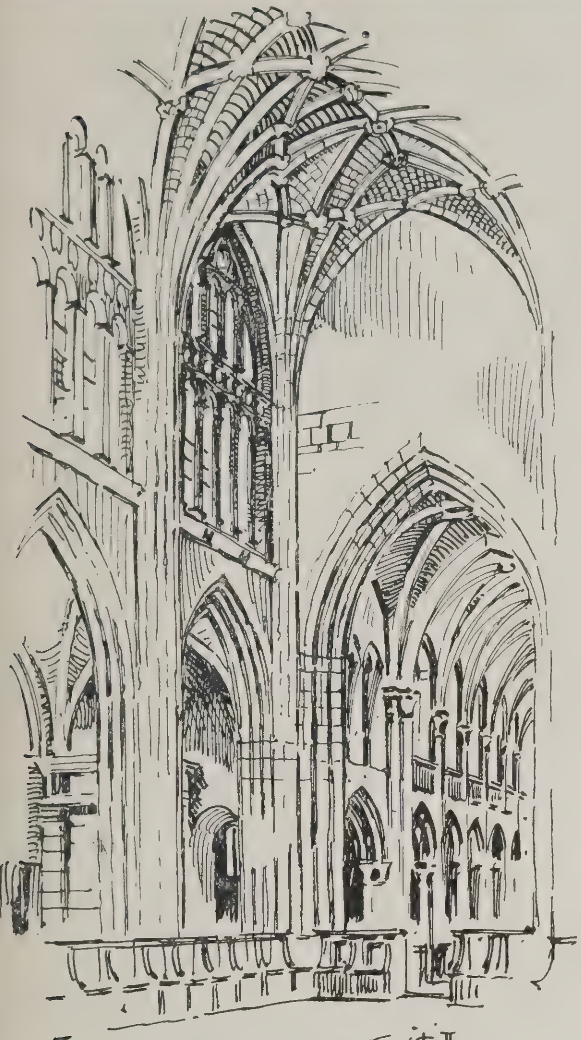
In other parts of northern France we find similar survivals of Gothic ideas in the churches that were built before, under the influence of the Jesuits, the native building tradition was displaced in favour of a more cosmopolitan architectural style founded upon the debased Italian rococo work of Bernini and his followers. A good specimen of Gothic survival is the cathedral at Orleans, the rebuilding of which was begun in the seventeenth century at the charges of King Henry IV., in whose reign certain parts of the Paris Louvre were being built with great two storeyed pilasters in the style of St. Peter's at Rome. At Dieppe the church of St. Remi, begun in 1522, was not finished till 1651; its impressive vaulted interior is almost purely Gothic in detail, excepting the moulded capitals of the round nave columns, and the transept was rebuilt as late as 1743 in the same style as the rest. St. Eustáche at Paris is rather earlier in date, but its detail is more classical and the medieval constructive system has been forgotten or else abandoned by its builders. The Renaissance churches at Troyes resemble more closely the contemporary work at La Ferté near Le Mans, particularly in the arcaded traceries of their clearstories, and the chevet of the church at Montargis near Sens is of somewhat similar character. This church is not very often visited by travellers, but it is certainly of considerable interest. It has a late twelfth-century vaulted nave of four bays with aisles, clearstory, and short transept. The choir is sixteenth and seventeenth-century work, with aisles of its full height and low chapels beyond, under large clearstory windows. The clearstory follows the lines of the apse and the effect of its wide windows seen through the tall narrow arches of the ambulatory is very striking. As in several of the Troyes churches, the chapels are enclosed in a rectangular wall following the line of the street, so as to avoid curtailing the length of the main avenue of the church. The detail is inferior to that of contemporary work at Troyes, but the general arrangement is interesting and suggestive.

To return to Troyes; in the sixteenth century a very lofty and imposing choir was added to the earlier and simpler nave of St. Jean's church. The outer walls of its chapels follow the street frontages without regard to the axis of the church, and in consequence there is much variety in the design of the flying buttresses and the treatment of the successive bays. Here the ground storey, with immense windows in the side chapels, is tolerably pure Flamboyant work; the clearstory and vaulting are Renaissance. A transept was begun but never completed, hardly any two bays of the vaulting are alike; in the south-east chapel the vault ribs form an open skeleton, the vault itself being a plain dome riding clear of the ribs. There is a little good seventeenth-century grisaille glass in the clearstory, and the eastern chapels contain some full coloured windows of the previous century. The effect of the apse is spoiled by a tall Rococo reredos, but the church contains a quantity of old woodwork, and its tall lantern-like choir forms a picturesque termination to the long, low, and somewhat dark nave.

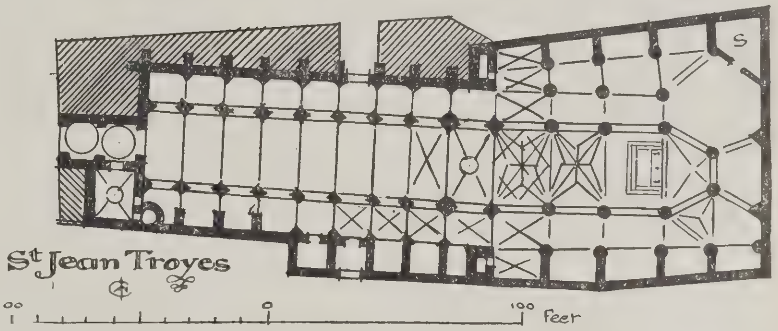
St. Remy, St. Nizier, and St. Martin, all good sized vaulted churches, were not completed until the end of the sixteenth century. The nave and crossing at St. Remy are fourteenth-century work, the choir and vaulting very late Flamboyant. St. Nizier is Flamboyant with a Renaissance clearstory and west end. St. Martin, which is entirely Renaissance, is in some respects the most interesting of these three churches. Their plans are alike in essentials, each of them has the flush transepts, and side chapels between the aisle buttresses which are characteristic of late Gothic town churches in France. Their chesets are all set out according to a method which was adopted by the builders of the church at Caudebec, near Rouen. The choirs end with an ordinary transverse vaulting rib, and beyond this is a three-sided apse surrounded by three approximately hexagonal chapels. The choirs of the Madeleine and St. Jean, and the somewhat smaller church of St. Nicholas, are planned in this fashion, with apses having three vaulting bays only instead of five or more, as in most French examples, and here, at Troyes, in the cathedral and St. Urbain's church. In vaulting a three-sided apse with ordinary radiating ribs, it is, of course, necessary to make some provision against the



St Remy Dieppe



St Jean Troyes



St Jean Troyes

westward thrust upon the keystone of the apse vault. The devices adopted in the cathedral and St. Urbain's have the effect of shortening the apparent length of the church, and the radiating ribs have the disadvantage of masking the clearstory windows of their apses. The Renaissance* builders managed to avoid both these difficulties by finishing their choirs with an ordinary rectangular vaulting bay and transverse arch and vaulting their apses with quadrilateral vaults of irregular plan with four main diagonal ribs, meeting in a keystone east of the chord of the apse. The easternmost pair of ribs being much shorter in span than the others and springing from a higher level, do not mask the central windows of their clearstories. The apse vault of St. Remy is simpler and even more ingenious than those of the other late churches in Troyes. Here a barrel vault commences at the chord of the apse, the springing of which would naturally rise along the canted bays, the crown remaining level. This barrel vault is cut into by "Welsh groins" over the side windows; the ribs at the angles of these groins abut upon a short segmental rib parallel with the east window, and, consequently, this apse has two keystones instead of only one.

The high vaults in the naves and transepts of these late churches are all of a uniform pattern. The ribs in each bay form a four-pointed star, the transverse arches are very deep and prominent, and the diagonals are slightly heavier than the intermediate and ridge ribs. The ridge ribs only occur between the main keystone and the intersections of the intermediate ribs and the vaults are considerably domed up, the central keystone being well above the point of the transverse arch in each bay. The division of the vaulting into bays is thus marked in an unusually prominent manner, and the general effect is thus entirely different from that of many English vaults of almost identical plan, in which the general surfaces are continuous and the ribs are all more or less in the same plane. The contrast is the more apparent from the method of filling in the vault cells adopted at Troyes, where each cell is closed in with small stones very much domed up, whereas in an English "lierne vault" the cells are almost always filled in with long flagstones. The fillings of the late vaults at Troyes are laid without much apparent system and some very unusual arrangements are found; in one instance the filling stones are laid in a spiral fashion ending in a keystone in the centre of the vault cell. Pendant keystones, which are common in Renaissance vaulting in other parts of France, are not much used in Troyes, probably on account of the scarcity of building stone of good scantling, but there is a rather fine example in the apse of St. Martin's Church. Although the high vaults of these churches are all very much alike, their aisles are often vaulted with ingenious, but

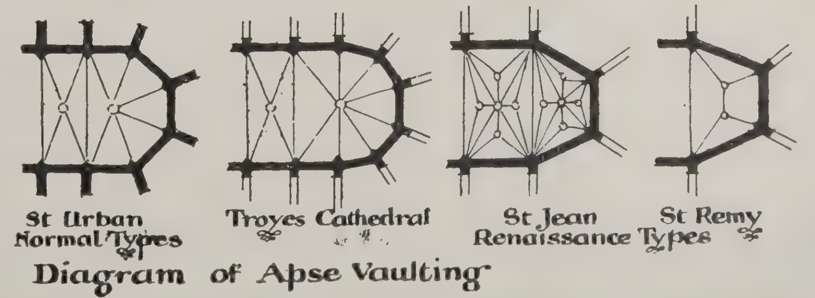


Diagram of Apse Vaulting

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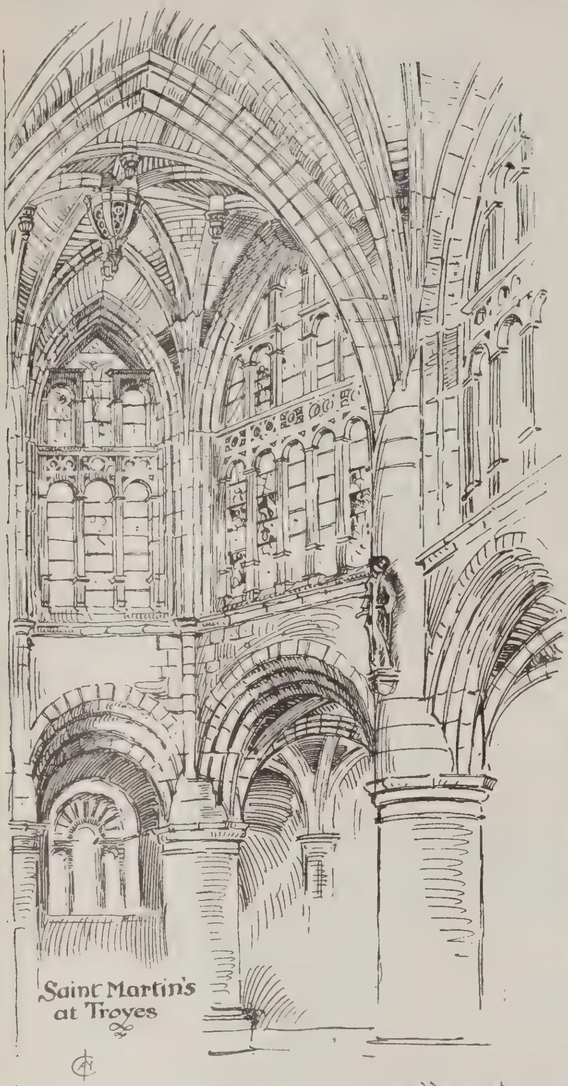
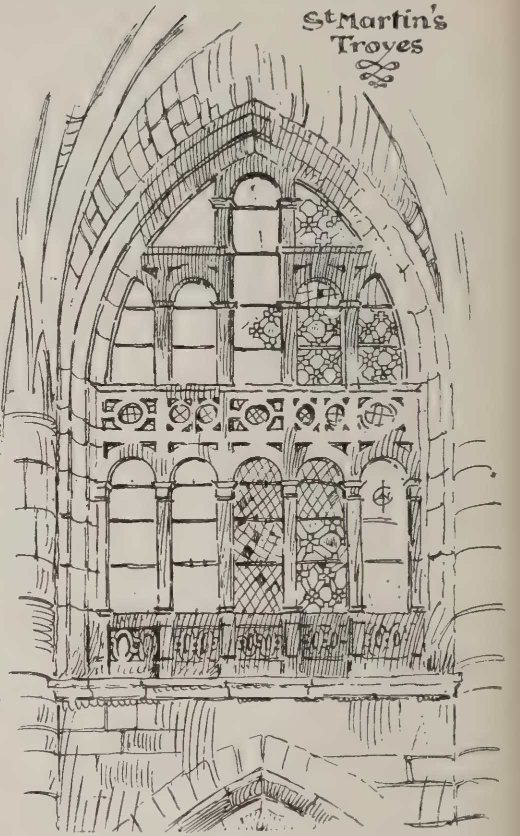
* The term "Renaissance" is here applied to the transitional style which survived in the provinces of northern France until the middle of the seventeenth century. The leading features of the churches of this age are almost invariably traditional as opposed to "foreign" or "classical."



Saint Martin's at Troyes

St Martin's Troyes

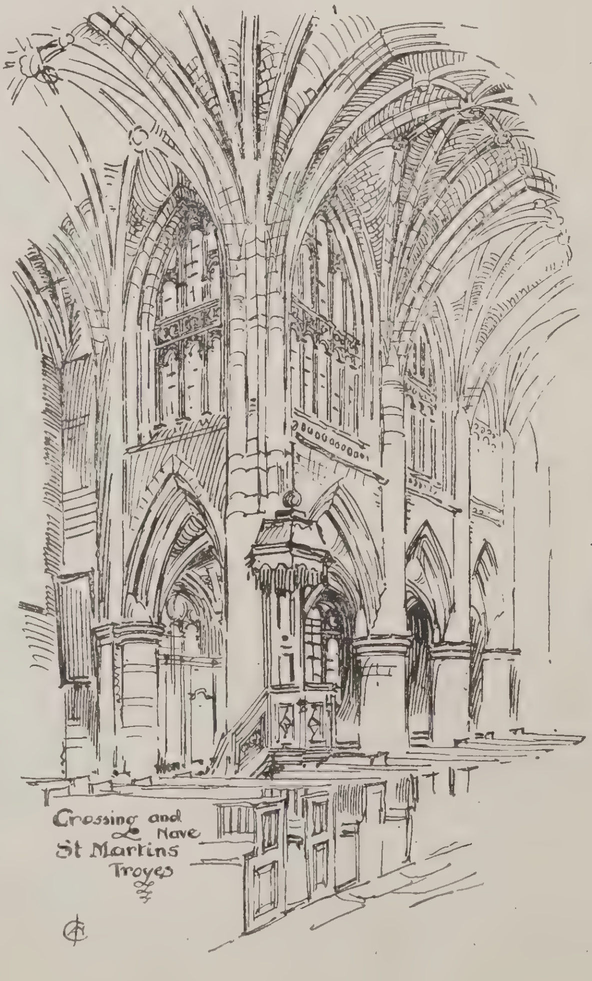
St Martin's Troyes



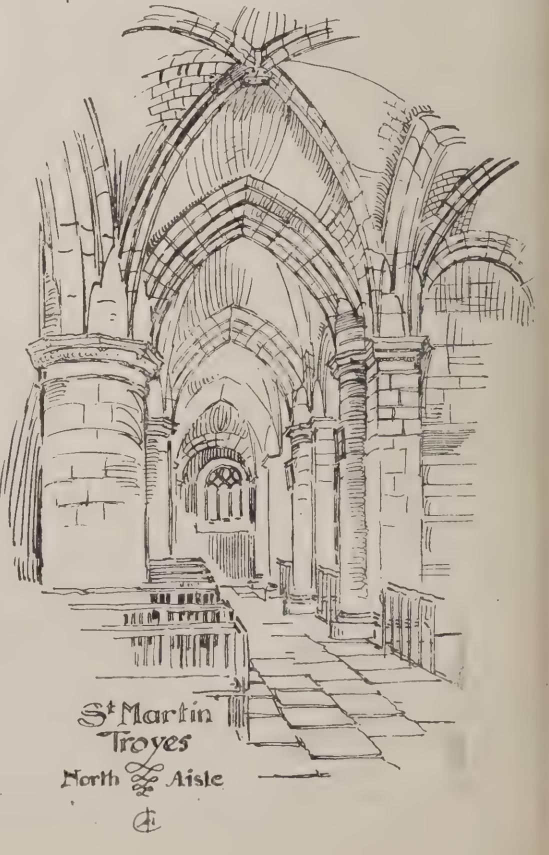
St Martin's Troyes

apparently somewhat purposeless, combinations of ribs according to the caprice of the individual builders. Thus at St. Pantaléon each oblong bay of the aisle is divided into two long triangles with a bold diagonal arch, the triangular compartments having each a tripartite vault with a keystone. The vaults of St. Martin's Church, which appear to be the most modern in Troyes, are more decidedly Gothic in character than many of the other examples. Here the aisle vaults are plain quadripartite and very much domed, almost "early" in effect. And in the high vaults, although the ribs are clumsily set out and intersect ungracefully at the springers, yet they are built in the early Gothic manner with the lower joints horizontal up to the level at which the ribs diverge sufficiently to clear each other.

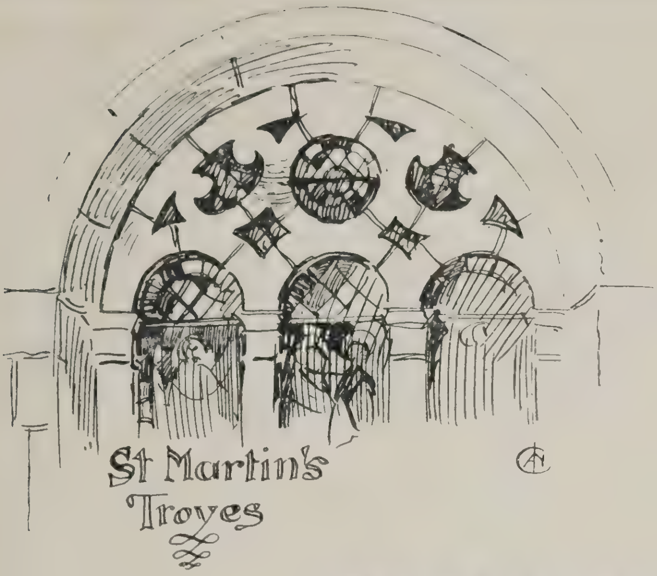
Almost all the late churches at Troyes stand well, and have escaped any serious distortion on account of settlements. St. Nicholas is, however, an exception to the general rule. It is vaulted on the same plan as the others, but with round instead of pointed arches, and, as is also the case at Saint Eustáche, at Paris, the circular vaults have bulged the clearstories and caused some very unsightly settlements. The fact is, of course, that the semi-circular form is unsuitable for the transverse ribs of a Gothic vault, because it generates diagonals of a weak, flattened, semi-elliptical shape, and because an arch of low curvature exerts a considerable thrust in proportion to the span, while the least

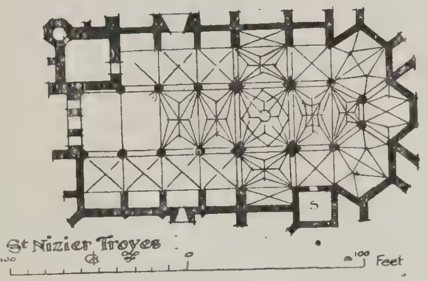


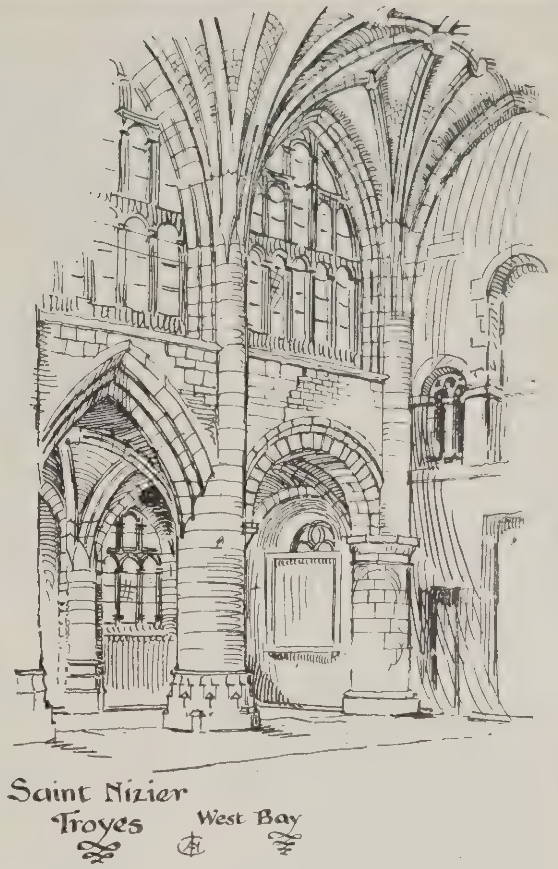
Crossing and Nave St Martins Troyes



St Martin Troyes North Aisle

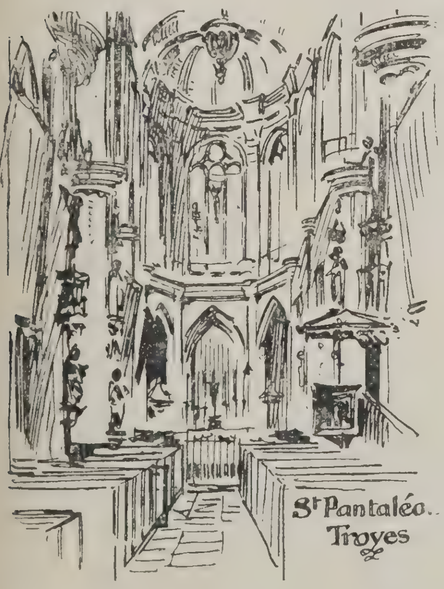


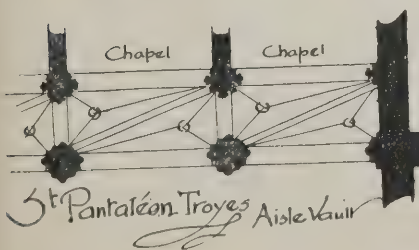




settlement necessarily causes a marked depression at the crown and a proportionate rise at the haunches, whereas a slight settlement in a pointed arch is far less noticeable, partly because the two halves of the arch more or less pivot upon the springers, and so accommodate themselves to any slight increase of span caused by the yielding of the abutments, partly also because slight irregularities of form are less evident in an intentionally broken curve than in a simple mathematical figure, such as the semi-circle or the ellipse.

The church of St. Nicholas is, however, a fine and interesting one in spite of its poor construction. Its apse would be similar to those which have been last described, but the ambulatory and chapels are cut off by a flat wall immediately behind the east window of the clearstory. There is thus no central chapel behind the high altar, and the two side chapels are of very irregular plan. At the west end is a very late two-storeyed Narthex, the upper stage of which forms a Calvary, and is approached from a large flight of steps occupying the greater part of the south aisle of the nave. In the north aisle is a curious temple-like structure representing the Holy Sepulchre—a winding staircase in this aisle is carried upon a corbelling of curiously interpenetrated Flamboyant mouldings finished with a kind of flourish—where they meet the wall, and, as in most of the churches of Troyes, there is some good late glass.





The larger village churches in the neighbourhood, such as those of Pont St. Marie, St. Savine and St. André, are built on a uniform plan and date from the fifteenth and sixteenth centuries. They have nave and aisles of equal height, vaulted from round pillars without capitals, flush transepts, polygonal apses to their choirs, and chapels between the buttresses of their aisles. Pont St. Marie has a stone tower with slated spire at the north-west corner, St. Savine a timber central saddleback tower, St. André a flèche. These churches are gloomy and not particularly interesting, though they contain some old glass and some picturesque seventeenth and eighteenth century fittings. At St. Savine, for example, several of the chapels retain their old altars, above one of which is a sixteenth century painted retable* on which stand three old painted images. St. André, too, has an old retable with carved bulging columns, not unlike English Elizabethan work, in its south-east chapel, and over the north-east altar in the same church some old Gothic tabernacle work has been incorporated in a modern retable. Here, too, the pulpit is late Gothic woodwork, and some sixteenth century paintings, which apparently once served as retables to the lesser altars, are preserved in the north aisle of the nave. Pont St. Marie church is less interesting than the others, but the vaulting is prettily treated in the north aisle, and the gables of the west front and the transepts have overhanging timber work like many of the old houses in the city.

All these churches have bits of Renaissance work generally about the doorways, contrasting quaintly but not unpleasantly with the Flamboyant detail of the surrounding features. Like most of the old churches in the district they are all three filled with eighteenth century pews of dark brown woodwork.

The church of St. Pantaléon in the Rue de St. Paul ends the list of the ancient churches of Troyes. Begun in the year 1516, upon the site of an older wooden church, it was probably injured by a disastrous fire in 1524. The work was recommenced in 1536, but was carried on in a very leisurely fashion, and not completed for over a century. Its plan is of the usual local type, rectangular in outline with chapels between the buttresses and flush transepts; on all four sides the church abuts upon narrow streets, and the east wall forms a tangent to the curve of the apse, as is the case at St. Nicholas. The church seems to have been temporarily roofed in at the level of the aisle vaults, the lower stage of the work being of late Gothic character with pillars of wavy section, capriciously planned vaulting in the aisles, and Flamboyant traceries in the windows. Above the arches, a heavy classic cornice runs right round the interior, and is bowed round the vaulting shafts; this cornice forms a gallery and is provided with an iron railing. The vaulting shafts run up between tall round-headed clearstory windows to the wall plate, where they terminate in coarse Corinthian capitals at the angles of the crossing and carry a stone entablature somewhat similar to the balcony below. The apse clearstory is circular, the lower stage being polygonal; the round-headed windows have Renaissance traceries and Corinthian pilasters in

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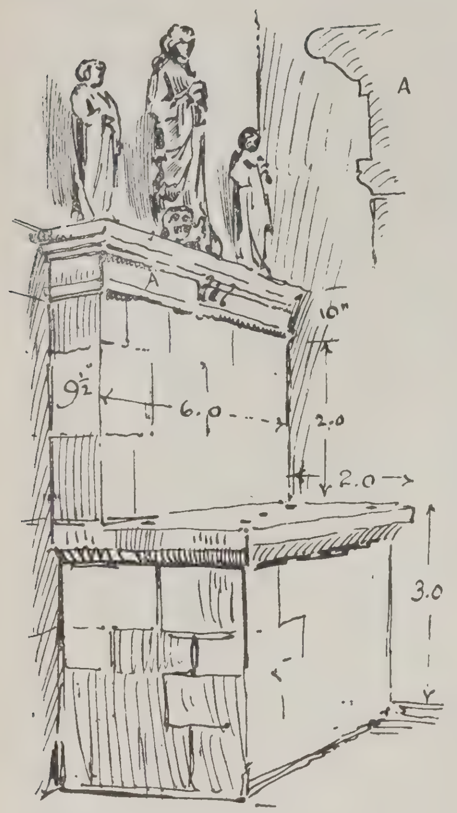
* The term "retable" is used in its proper sense denoting a "reredos" and not a ledge for ornaments



17th Cent. Altar
St Savine
Troyes

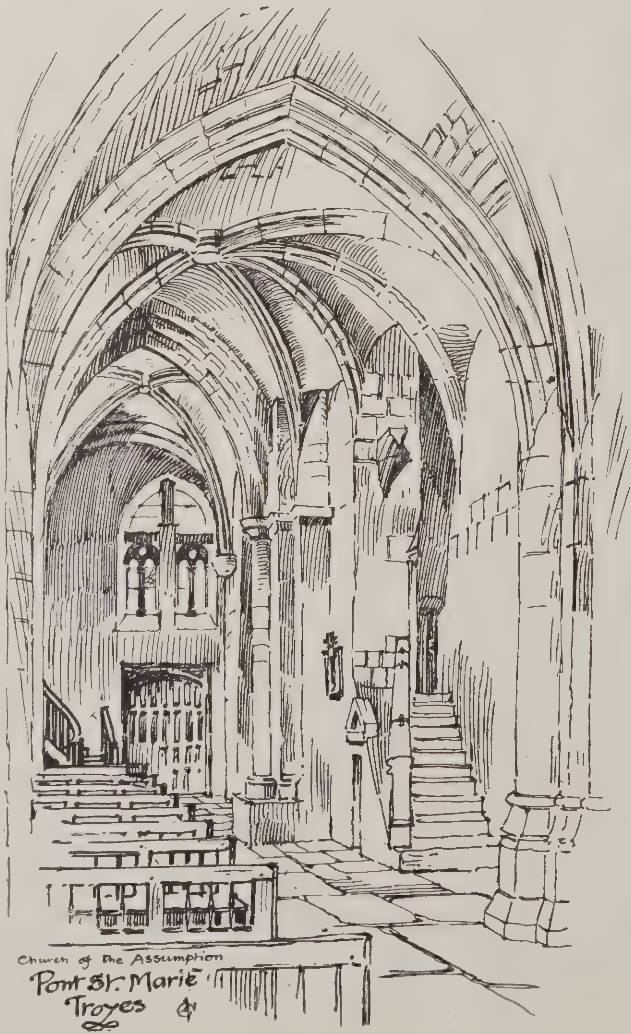
place of vaulting shafts. The church was designed for vaulting, and flying buttresses were commenced, but never completed; the present ceiling is a ribbed barrel of oak, with a semi-dome over the apse and a groin at the crossing. It has a large and elaborately-carved oak pendant in the apse, and is now of a soft greyish colour which tones very well with its surroundings.

The general proportions of the church are very tall and narrow, especially in the transept, where it is possible to shake hands across the projecting balconies. Upon the piers are a double series of stone statues under very delicate and rich canopies, the upper series of figures being on a smaller scale than the lower ones, and under the pier arches large oil paintings are hung between beams reaching from pillar to pillar. The position of these paintings is most unusual, and, although they have no great merit in themselves they contribute a good deal to the effectiveness of the interior by partially screening the aisle windows and giving the nave the effect of being lighted almost entirely from above.

Several of the chapels contain nice pieces of tabernacle work and sculpture, the most interesting being a group in the south-west chapel, formerly the oratory of the Shoemakers' Guild, representing St. Crispin at his trade, with several other figures. This is carved in the round, nearly life-size, and painted; it stands under a very pretty Gothic canopy over the site of the former altar of the chapel. The west bay of the south aisle is occupied with a large Calvary group, not very old, but of some interest. On the west wall is a staircase and a Gothic gallery, on the balustrade of which are two half-length figures of high priests watching the scene below.

In such a church as this, where so much old work has been spared, it is disappointing that the rood-loft has been destroyed and that the altars are all modernised. Unhappily, there is scarcely an important church in France which retains its rood-loft; scarcely an altar which has not been rebuilt or else mutilated so as to accord with the theatrical ideals introduced by the Jesuits of the seventeenth or eighteenth centuries.

So we may take our leave of the churches of Troyes in thankfulness that they have at least been spared the crowning degradation of a garnishing of medieval stencil work and that the Calvary at St. Pantaléon has not been cleared away to make room for a grotto of Lourdes.



Church of the Assumption
Pont St. Marie
Troyes

Views and Reviews.

Small Houses.

The author of this little book has set before him the tasks, firstly, of compiling a guide for the client to the line of thought generally adopted by the architectural profession on the subject of building a home, and secondly, limiting the discussion to houses costing not more than £1,000 each. The book, as expressly stated in the preface, is not intended to be for architects or for speculators, but for those who wish to build for themselves. The author, who is an architect, says, "It has ever been the case since the architect became a professional man, and ceased to employ his own mason, that one of his chief difficulties has been to impart to his client a proper understanding of the building he proposes to erect. Plans and elevations give a diagram of the dry bones; a perspective view may give the general outline, but neither of these will carry any conviction to the lay mind without some vision of life as it will be in the completed building, or unless each drawing and architectural conversation carries with it the scent of real bricks and mortar. The result of this difficulty has been twofold. On one side it has spread an unwholesome view of what domestic architecture means, and on the other side it has produced apathy, and eventually ignorance, on the whole subject." The book must, of course, be judged from the standpoint from which it is written, and, so far, we think that it is, on the whole, to be commended. Certainly, the illustrations contained in the book cannot be taken exception to. They are all houses that are simple in design and well proportioned. Several well-known architects have provided illustrations of houses designed by themselves, such as Mr. Guy Dawber, Mr. E. J. May, and Mr. Ernest Newton. The author discusses sites, planning, exterior effects and materials, interior effects, and kitchen quarters in a series of chapters, following which there is a chapter on pipes and electric wiring, the last information being contributed by the Rev. J. S. Martin, formerly engaged as an electric light and telephone foreman under a London firm of engineers. The concluding chapter is one on the alteration of old houses. From this summary of the contents the character of the book is obvious. The author has written the book in a clear, straightforward style, easily understandable by the client, and it will form interesting reading to architects, for, although almost all the author has to say is commonplace information to professional readers, it may serve to remind them of some points that are apt to get lost sight of, and perhaps offer a few hints. In the appendix the Royal Institute of British Architects' schedule of fees is given so that clients may be in a position to know what they are expected to pay an architect.

"The Small House: its Architecture and Surroundings," by Arthur Martin. London: Alston Rivers, Ltd. Price 2/- net.

Mr. Walter Emden, J.P., the well-known West End architect, who has now retired from business, has presented his business to his four principal assistants—namely, Mr. S. H. Egan, Mr. W. S. Emden, Mr. A. J. Croughton, and Mr. T. C. Ovenston, who will now carry on business at the same address under the name of Messrs. Emden, Egan, & Co.

Correspondence.

"A Preliminary to Registration."

To the Editor of THE BUILDERS' JOURNAL.

SIR,—In your comments upon a letter from me which lately appeared in the *Freeman's Journal* you seem to take exception to my praising the action of the Chief Secretary, Mr. Bryce, in adding a clause to the new Labourers (Ireland) Act, requiring that persons appointed as architects, engineers, surveyors, or clerks of works shall satisfy the Local Government Board of their fitness for their respective positions. I ventured to deprecate the action of the *Freeman's Journal* in denouncing the Chief Secretary for introducing this small measure of justice. You go on to regret that the duty of determining whether a man is qualified or not should fall upon a department llke the Local Government Board. I am quite in agreement with you that that Board would not be a suitable examining machinery for such a purpose; but they already have powers to determine whether a dispensary doctor or a midwife is qualifield or not. The Board conducts no examination, they simply determine on the testimonies of study before them whether such candidates are genuine practitioners or simply quacks. The only difference is that while with doctors or midwives there is a recognised minimum standard, in architecture there is none. Perforce, then, the Board will have to adopt a rough and ready standard of its own. I quite agree with you that in the absence of a recognised diploma of some sort it would be better to delegate the duty of sifting the pretentions of candidates to some better qualified body, such as the Institute of Architects. Failing that, however, Mr. Bryce's clause is a most valuable concession if the Local Government Board administer it with firmness and decision.

It is evident from the tone of your remarks that you in England have little conception of the extent to which men who have never studied architecture for a single hour engage, and often successfully from a financial point of view, in architecture, in the provinces particularly.

I have before me a cutting from a provincial paper which records the election of an "engineer" to a certain rural District Council. Tenders were invited for the post, and the two lowest were respectively £25 and £14! Both gentlemen had backers on the Board, but the strongest recommendation put forward for the £14 man was that he was "the son of an extensive ratepayer," and by another backer "that he was a young man seeking an opening." The merits or qualifications of the candidates were apparently never even mentioned! and the £14 man was duly elected. It must be remembered, too, that in provincial Ireland the term engineer comprehends architect and surveyor as well. The candidate elected will in this case, in all probability, have to do any and every kind of work usually done by engineers, architects or surveyors to such bodies, including most likely the supervision of a large number of cottages built under the Labourers Act. Of the abilities of this particular gentleman I know nothing, but a man who offers to undertake the duties of such a post for £14 a year does not rate the value of his professional services, it must be admitted, at an exorbitant price. Such cases are, however, common enough.

I will only add that the Labourers Act, although it has received the Royal Assent, will not come into force until April 1st next (auspicious date!), and meanwhile the Local Government Board, the sanctioning authority, have no power to veto, even the most glaring jobs.—Yours etc.,

R. M. BUTLER, Architect.

DUBLIN.

[The Board can only enquire into a proposed architect's experience, but this will play into the hands of established architects, and not afford a young man qualified, but with little or no practice, a chance. The only logical course is to require an examination diploma.—ED., B.J.].

A Correction.

In the letter addressed to us by Messrs. Young & Hall, and published on p. 65 of our issue for last week, a word was omitted by the printer in the seventh line from the end. It should have read: "There are always two kinds of cases which could *not* be removed."

IN PARLIAMENT.

(By our Press Gallery Representative.)

Regent Street Quadrant.

In the House of Commons Mr. Fell asked the Secretary to the Treasury whether it was proposed by the Commissioners of Woods and Forests to rebuild Regent Street with a colonnade on each side; and, seeing that the original colonnade in the Quadrant was removed as it was found to be objectionable and to render the shops too dark, and that colonnades were out of place in this dull climate, and were never built now even in the City of Paris, whether he will give this proposal his most serious consideration before agreeing to it.

Mr. M'Kenna in reply said he understood that there was no intention of rebuilding the street with a colonnade.

The Millbank Art Gallery.

Mr. P. W. Wilson asked the First Commissioner of Works, whether it was proposed to utilise the space behind the National Gallery of Art, at Millbank, for the purpose of building a new Stationery Office or other Government office; and, seeing that such building, if erected, would render it impossible to make additions to the Art Gallery, which was becoming overcrowded with pictures, whether he would consider the advisability of reserving this ground for the extension of the Gallery.

Mr. Harcourt said that the reply to the first paragraph was in the affirmative. In accordance with the scheme sanctioned by his predecessor, it was proposed to build the Stationery Office upon the vacant land behind the National Gallery of Art, at Millbank. The extensions originally contemplated when the site was offered by the Government to Sir Henry Tate in 1893 had already been made. He would make inquiry as to the future needs of the Gallery, and would reconsider the matter before next year's estimates were framed. He might mention that some space was still reserved for the purposes of the Gallery.

Westminster County Court.

Mr. Nield asked the First Commissioner of Works whether it was intended to rebuild the Westminster County Court, and if so, when such works of rebuilding were likely to be commenced; whether plans had been prepared of the proposed works, and if the same had been approved by the local authority and by the judge and officials of the court; and if not, whether such approval would be required before the building was commenced.

Mr. Harcourt said the reply to the first paragraph was in the affirmative. The work of rebuilding would be begun so soon as the contract could be made. Sketch plans had been prepared and had been seen by the judge and registrar of the court, and the building would be carried out as far as possible to meet their wishes. He was unable to give any undertaking such as was suggested in the concluding paragraph of the question. The local authority had no jurisdiction.

Phoenix Park Glass Houses.

Mr. Field asked the Chief Secretary for Ireland whether he could state under what circumstances contracts for the erection of glass houses in the Phœnix Park, Dublin, were given to a Scotch firm, and whether Irish firms were invited to tender for the erection of these houses.

Mr. M'Kenna in reply stated that these houses were urgently required and that the work was of a special character as regarded the design, the details of construction and the arrangements for ventilation. In these circumstances the Board gave the contract, after being satisfied that the terms were reasonable, to a firm of well-known specialists in this kind of work, who had executed contracts in the past to the Board's entire satisfaction. There were considerable building works in connection with the erection of the glass houses, and these, he understood, had been carried out, either by Dublin contractors, after tender, or by the Board's workmen.

Foreign Cement.

Mr. John Ward asked the President of the Board of Trade whether he could give the number of tons of foreign cement imported into the United Kingdom in 1905, and the countries from which such cement came; also whether he could give the names of the firms in this country to whom the cement was consigned, the ports at which it was unloaded and stored, and the work upon which such cement was used; whether he was aware that the great bulk of such imported cement was retailed as British Portland cement; and what action, if any, he proposed to take to protect the public from fraud of this character.

Mr. Lloyd-George replied in the following terms:—A statement has been prepared and will be communicated to the hon. member giving all the information available as to the quantity of cement imported from foreign countries into the United Kingdom at the various ports during 1905. The names of the ultimate consignees of the cement cannot be given, as the law only requires the names of the importers or agents to be furnished in the "entries." Imported Portland cement bearing marks implying that the goods are of British manufacture would be required to have these marks duly qualified, so as to afford a definite indication of the country of origin, in accordance with the requirements of Section 16 of the Merchandise Marks Act, 1887. As to retail sale, a false trade description would appear to be applied if foreign Portland cement were retailed as British, and it would be open to anyone aggrieved to take action under the Act referred to.

THE TIMBER TRADE.

London Market in July.

The record of the wood trade during July may be considered satisfactory on the whole, in that buyers in the country generally have found a readier market than usual for their early purchases, and have confidence enough in the future to contract for their late summer and autumn requirements at the higher range of prices now current. This does not apply to the London trade, where the demand still compares most unfavourably with that of 1905, and the deliveries have fallen off no less than 21,000 standards in all for the first seven months of this year. In consequence of this heavy reduction in the demand, merchants have, of course, done a smaller business, but the course of the markets abroad has helped them to some extent, and the trade has been sounder and more remunerative than in some years of big figures. Messrs. Churchill & Sim think that freights are inclined to stiffen a little as autumn insurance rates come nearer, and tonnage is not quite so freely offered.

Messrs. Denny, Mott & Dickson, Ltd., report on Baltic and White Sea goods as follows:—"Business in July has shown some improvement, and as such increase in turnover has been accompanied by a hardening in prices, the outlook is somewhat more satisfactory. Floorings and small-sized scantlings are in demand, and the prices of these show a decided improvement."

The abstract of dock stock, consumption, &c., for July, published by Messrs. Foy, Morgan & Co., is given in the table at the foot of this page.

Dock Stock.

The stock of wood in the public docks on July 31st was:—

	Pieces.
Foreign deals and ends - - - -	1,216,000
Do. battens - - - -	1,427,000
Pine deals and battens - - -	628,000
Spruce do. do. - - -	538,000
Boards, rough - - - -	2,774,000
Do. prepared - - -	5,957,000

totalling 12,540,000 pieces, as against 14,707,000 in 1905, 17,004,000 in 1904, and 17,129,000 in 1903.

In other kinds the stock was as follows:—

Foreign wainscot logs - -	306 pieces.
Do. oak timber - -	359 loads.
Do. fir timber - -	1,703 do.
Do. Oregon pine, &c., spars and masts - -	4,070 do.
Colonial oak timber - -	834 do.
Do. birch timber and planks -	3,983 do.
Do. elm and ash timber -	941 do.
Do. yellow pine - -	704 do.
Do. red pine - - -	32 do.
United States pitch-pine timber	17,277 do.
Do. do. deals -	18,000 pieces.
East India teak - - -	7,592 loads.

Deliveries.

The deliveries have been—

	First seven months. Pieces.	July. Pieces.
Foreign deals and ends -	1,817,000	245,000
Do. battens - -	2,993,000	367,000
Pine deals and battens -	608,000	82,000
Spruce do. do. -	667,000	73,000
Boards, rough - -	2,956,000	398,000
Do. prepared - -	8,010,000	1,163,000
Total - -	17,051,000	2,328,000

The deliveries from ship to craft have been—

	First seven months. P.s.h.	July. P.s.h.
Deals and battens - -	53,993	22,331
Boards - -	12,343	3,129
Total - -	66,336	25,460

Soft Woods.

Sweden.—The importation of Swedish deals in July has been an average one, though larger than in 1905. Battens and prepared boards have also come forward rather more freely, but except for the latter, and for the smaller sizes of scantlings, prices have not responded to the higher levels current at the shipping ports. A fair amount of progress can be recorded during the month in the distribution of what remains for summer and early autumn delivery, but London buyers are inclined to wait for an improvement in the conditions here before entering into further purchases, especially in view of the higher figures which they will have to pay for their stock. There has been little indication of any favourable movement in the South African market, but the decision of the Government in regard to the future political status of the new Colonies will, at all events, clear the air a little, and a return to settled conditions should stimulate business to some extent later on.

From Norway a large supply of floorings has brought the importation up to beyond last year's figures. Norwegian shippers have taken full advantage of the improved prices current in London, although these do not yet compare with those obtainable elsewhere.

Russia.—The supply of Russian deals has been smaller than usual, but ample for the present demands made upon it. Prices in London have not improved during the month except for battens, which are decidedly scarce for shipment. The business for forward delivery has been small and mostly confined to filling up parcels at the full current prices. Shipments continue regularly and with no recurrence of labour troubles so far.

From Finland an average importation, with a fair inquiry for battens, and an eager demand for scantlings, is the record for July. Prices for the latter have moved up a point or two, and the prospective supply of them is small.

From Prussia, in the absence of demand the stock of fir timber has slightly increased, but importation has been on a small scale, and quotations at present are very firm in sympathy with the high cost of pitch pine. Oak has not been in good demand, and the stock is the smallest seen here for many years.

As regards Canada, pine deals have arrived freely during July, but the demand for them continues slow, especially for the higher grades, unless of undoubted quality. Spruce has been in fair demand and with a small importation prices are here and there inclined to harden. The cost of both pine and spruce deals has discouraged new business for forward delivery, but the stock is at present ample for the trade's requirements. Birch planks have been moving slowly and prices show signs of drooping for some sizes which have come forward too freely. The demand for sawn pitch pine continues good, a fair quantity has gone into consumption during the month, and there are signs of a further improvement in the demand. The position of the market has been more settled owing to the renewed firmness of prices at the shipping ports, and the broadening of the demans outside Europe. The importation of deald and boards was considerable in July, and prices are not quite up to the level of the previous month.

Hard Woods.

Mahogany.—The chief feature in this market is the small stock. Messrs. Denny, Mott & Dickson, Ltd., had stated that Cuba wood is very bare in supply, and has risen in price. Tobasco is also short and has hardened. Any revival in the sluggish consumption would cause a very perceptible all round rise in values, seeing that stocks are so bare, whilst forward supplies, as far as can be judged, will be light. Churchill & Sim are also in agreement with this judgment. They state that at the auctions last month the attendance was large, competition active and prices generally had a higher tone. "The arrivals have been very light, and this market is now in the exceptional position of there not being a single entire cargo of mahogany unsold, and it is consequently very favourably placed to receive fresh imports, which are much needed."

Teak.—The most noticeable feature of the market, Messrs. Denny, Mott & Dickson state, has been the pressure to realise Java wood of inferior quality and specification. This description of wood has accumulated in stock, owing to unsuitable shipments having been rushed forward in the expectation that the high prices required for the reduced importations of Burmah and Bangkok wood would ensure an outlet for any kind of cheap teak. Teak, however, is now too expensive to be used for other than high-class work where suitable quality and sizes are imperative, and it is therefore bad policy for the shippers of a comparatively experimental wood like Java teak to handicap its undoubtedly useful qualities by sending forward consignments both inferior in quality and specification to those shipments which originally made the wood well worth the consideration of consumers as at least usefully supplementing the abnormally reduced supplies from Burmah and Siam. Rangoon and Moulmein importations for last month were small, and fell short of the consumption, which, however, was very restricted. Prices remain very firm for first-class wood, but second-class logs are difficult to sell, as the same reasoning applies to inferior Indian wood as to the inferior Java wood.

ABSTRACT OF STOCK, CONSUMPTION, &C., IN LONDON DOCKS, FOR JULY.

All Docks.	Deals (Fir).	Battens (Fir).	Pine.	Spruce.	Pitch-pine Deals.	Deals and Battens in Aggregate.	Rough Boards (All Countries).	Flooring.	Floated Timber.
	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Pieces	Pieces.	Pieces.	Loads.
Public dock stock - - -	1,098,601	1,606,702	621,773	538,030	17,613	3,882,719	2,773,452	5,975,096	24,500
Monthly public dock consumption - - - -	206,043	406,757	77,460	71,777	3,542	765,579	390,462	1,119,011	3,566
Overside stock - - -	412,086	813,514	154,920	143,554	—	1,524,074	780,924	369,274	—
Overside consumption (estimated of dock):— 98 per cent. Sawn / 63 ,, Planed	201,922	398,622	75,911	70,341	—	746,796	382,653	704,977	—
Duration of supply at same rate of consumption - -	3·70 months.	3·01 months.	5·06 months.	4·80 months.	4·97 months.	3·58 months.	4·60 months.	3·48 months.	6·87 months.

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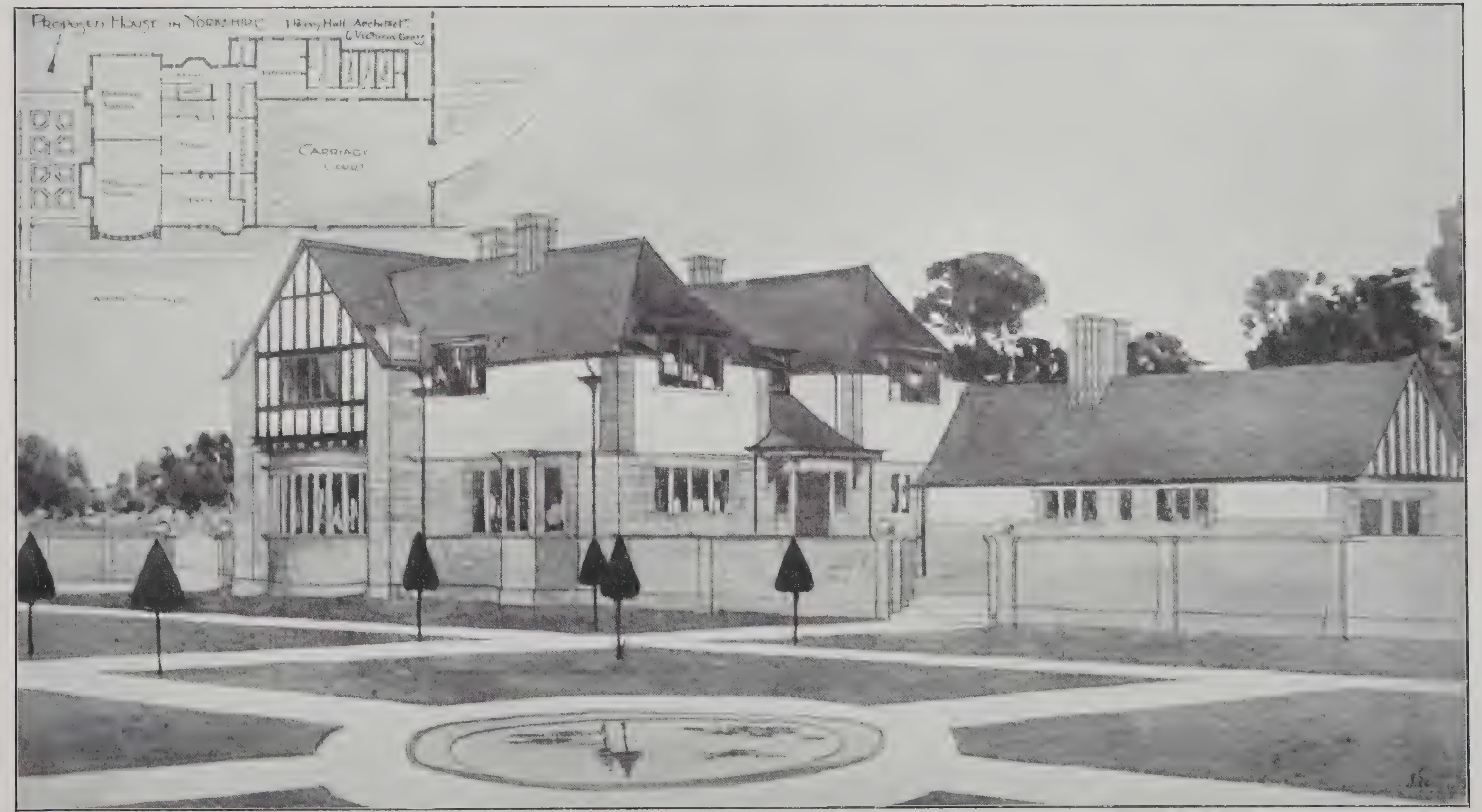

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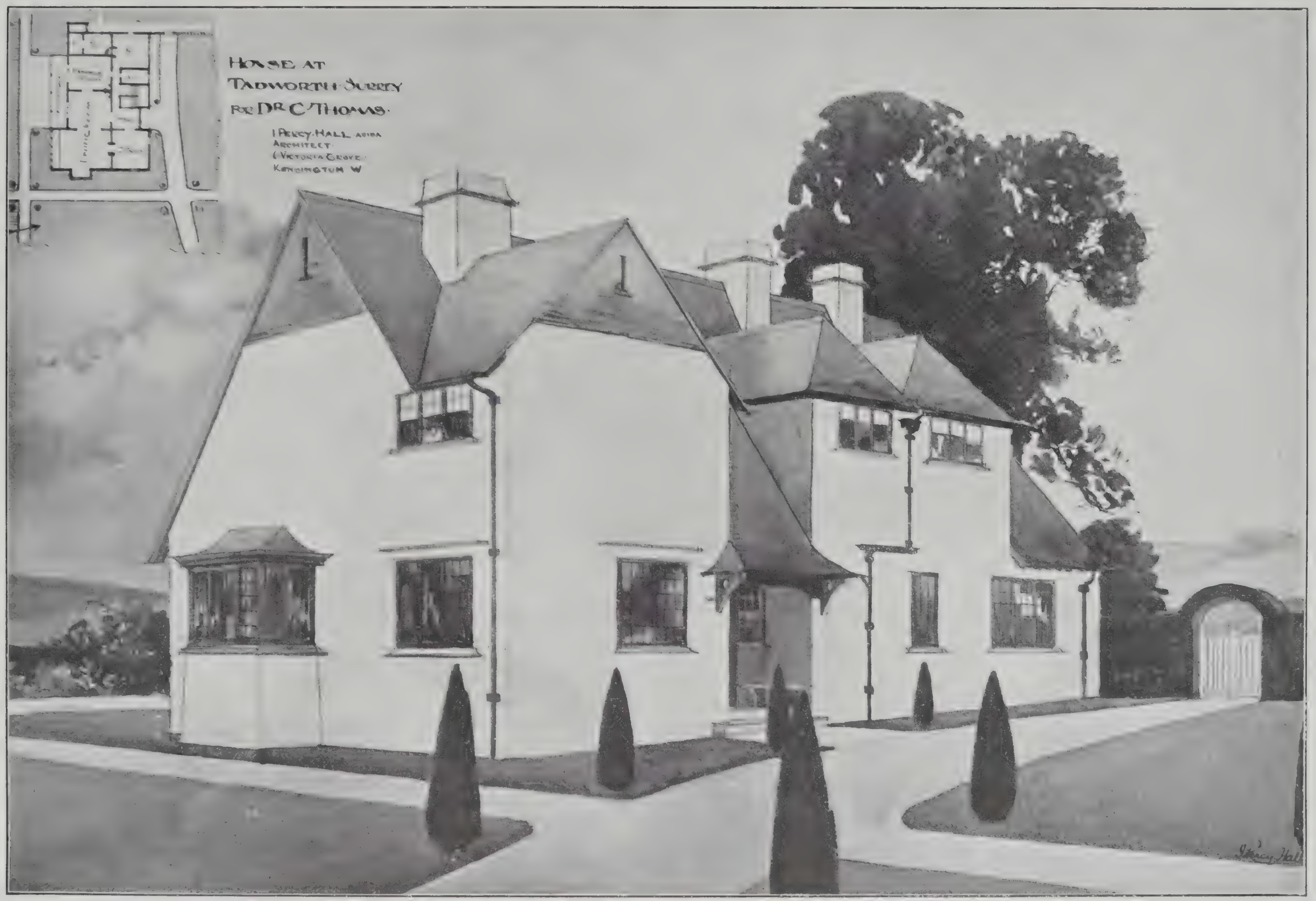

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Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional, or legal matters.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Fire-Resisting Floor for Stable.

LONDON, S.E. — BUILDER writes: "Kindly give me scantlings of a 'fire-resisting floor' for a first-floor stable, 27ft. clear span, for *heavy* horses. Also what is the angle and construction of the *run up* for the horses (5ft. wide)?"

The arrangement of the main girders and small cross joists is shown in the part plan Fig. 1. Allowing a load of, say, 3 cwt. per ft. super, including weight of girder and floor, each girder will have to carry, say, 32 tons, requiring two British standard beams (B.S.B. 23), 14ins. by 6ins. by 46lbs. Each of the small joists will have to carry a load of, say, 2½ tons requiring a (B.S.B. 6), 5-in. by 3-in. by 11lbs. joist. Piers 18ins. by 9ins. will be required under the main girders. A section through one of the main girders is shown in Fig. 2, with alternative methods of casing in the joists. The "run-up" for horses to first floor stable should not be steeper than 22½ degrees.

HENRY ADAMS.

Hipped Roof With Stone Slates.

LONDON.—B. P. writes: "(1) Please tell me how best to construct a roof shown (sketch not reproduced) of 26ft. span, pitch 55°, length 51ft., hipped at both ends, covered with extra thick Westmoreland slates (12 cwts. to the square), with rafters at 15° centres spiked at foot to joists at floor level? The chief difficulty is how to support the purlins at the hips. They should take a central position, but a post taken vertically down at this point will entirely cut up the attic bedrooms.

"(2) Can you tell where I can obtain in the neighbourhood of Byfleet (near Woking) stone that could be used for exterior rubble walling, and what quarry would you recommend anywhere in the South of England—but as near Byfleet as possible—where stone slates for roofing can be procured?"

(1) The type of roof shown is very defective as against wind pressure, but there ought to be no more difficulty in putting uprights to the hip and jack rafters than to the others in a similar position, as the wedge end of the floor could not be utilised if they were omitted. The points of support should come under the purlins. (2) Kentish Rag would be an excellent stone for the exterior rubble walling. Stone slates for roofing may be obtained from Stow-in-the-Wold, Somersetshire, but they are rather thick and heavy.

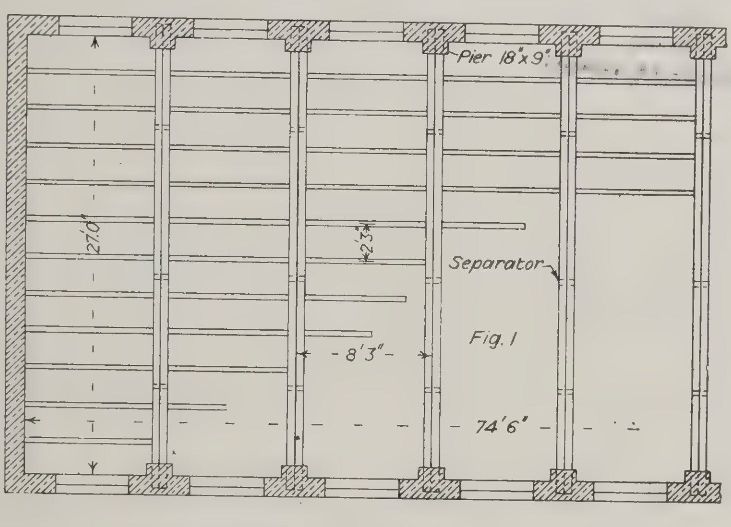
HENRY ADAMS.

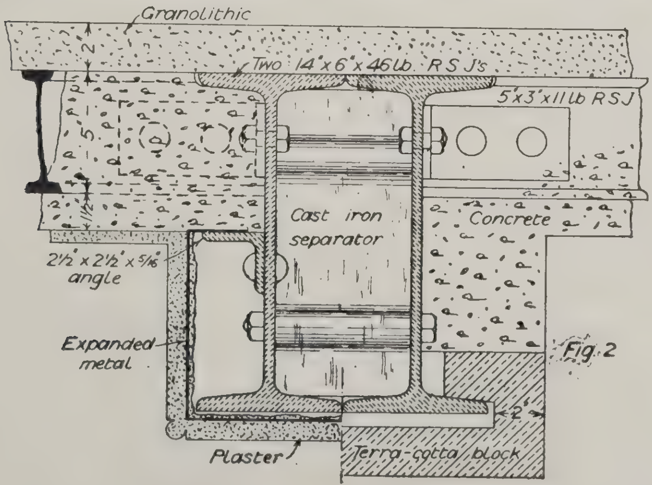
Wood Floor Covered with Cement.

HARROGATE.—A. I. writes: "What is a simple method of testing the stability and weight-bearing capacity of an old wood floor. This, the first floor, is covered with a thin layer of cement about 2ins. or 3ins. thick. Will this have the effect of rotting or destroying the timbers in any way?"

It is not a good plan to cover wood floors with cement, as the free access of the air being prevented they are very apt to rot, the same as when covered with linoleum or oilcloth. The parts likely to go first are the corners of the room. It is rather difficult to ascertain the condition of the floor without removing some of the cement or some of the lath and plaster from the ceiling below. A rough test may be made by measuring the deflection of the ceiling from the floor below when a load of 5cwts. is placed in the centre, and trying the deflection of a similar size floor without cement on it.

HENRY ADAMS.





FIRE-RESISTING FLOOR FOR STABLE.

Buildings near Banbury.

LONDON, S.E. — W. M. T. writes: "What are places best worth sketching within easy access of Banbury?"

At Banbury there are several old houses dating from 1570 to 1648. Two and a half miles south-west of Banbury is Broughton Castle, which is one of the most interesting houses in Oxfordshire, both as regards its history and its architecture. Its first appearance is that of an Elizabethan mansion, but a considerable portion dates from 1301 to 1307, inclusive of the hall, from which bays were thrown out in 1554, when Tudor windows were inserted instead of Gothic. The old battlements and lower part of the gatehouse and stables along the north side of the moat date from 1406, when permission to crenellate was granted by Henry IV. The castle contains many fine pictures and other art objects of great interest. One mile west is Tadmarton, with a small Decorated church, which has a lofty tower and sanctus-bell turret. Swalcliffe one mile west of Tadmarton has a fine church with Decorated exterior, and with Norman nave and Perpendicular tower. There is a good open tower roof, and the chancel screen retains much of its original painting and gilding. Three miles north-west of Banbury is Wroxton, containing an Augustinian priory and a Decorated church. A fine Transitional-Norman and Early English church is to be found at Alkerton. Between Banbury and Wroxton are the remains of Hanwell Castle, built in 1513, and an Early English Decorated church. Horley Church is of the Decorated period, but contain a beautiful Early English piscina, and Hornton Church in Transitional-Norman and Early English. Three miles north of Banbury is the village of Bowton Magna, which contains a desecrated church, now used partly as a dwelling house and partly as a school. It is Early Decorated in style, and retains its original roof. The east window contains good tracery. The piscina and locker remain in their original positions, and there is a beautiful Decorated window in the north wall.

H. Y. M.

Developing an Estate.

TAUNTON.—"ENQUIRER" writes: "A client is the owner of the property A, which abuts on, and is some feet higher than, the road, and is fenced in by a stone retaining wall. The width of the road from the base of the retaining wall to the other side is 26ft. 2in. There is a path on the opposite side of road, but none against the aforesaid retaining wall. We wish to develop our client's land as a building estate, but the Council will only pass the plans on the consideration that we make allowance for a 36ft. road. Can we be compelled to give up this land without receiving compensation ?"

If your client is laying out a *new* street he must take care that the total width is not less than 36ft. (carriage and footways together), but a sanitary authority has no power to call for the compulsory widening of an old roadway without compensation. I imagine that your client merely wishes to build upon land which has its frontage to an existing highway, and I therefore am of opinion the Council are not legally justified in asking him to sacrifice land for road widening. I advise you to ask under what by-laws or by what statutory powers they claim such a right. F.S.I.

EGYPTIAN ARCHITECTURE.

In the Anthropological Section of the British Association at York, last week, Professor W. M. Flinders Petrie delivered an address on the Hyksos and the work of the British School of Archæology in Egypt. The work of this British School during the past winter in Egypt had produced historical results as enlightening as any of recent years. For the first time they had been brought face to face with the Hyksos, or Shepherd Kings, in their own work. The city of Ramases, which the Israelites built, along with Pithom, had been made to tell its long history, and the town and temple of the High Priest Onias had been at last brought tangibly before them. The history and nature of the Hyksos conquest had long been debated. To the later Egyptians it was a mystery how such barbarians should have overrun their land; while to the modern students these people had been the subjects of many theories.

Professor Petrie described the great camp he had found at Tell el Yehudiyeh, twenty miles to the north of Cairo. It was certainly older than the 18th dynasty, and as certainly embanked by barbarian invaders, and with many graves inside and outside, all of Hyksos age, 2500 B.C. The camp was about 1,500ft. across; the bank was about 200ft. thick at the base, and was faced outside with a great slope of white stucco, 70ft. or 80ft. long, at an angle of about 40 degrees. But the makers knew nothing of brickwork, or even timber construction, and a gateway did not enter into their defensive system. Their only way into the camp was by a sloping road over 200ft. long, which rose up to the top of the bank. No such fortification was known before in Egypt. Within a year or two these defenders borrowed the walling from the Egyptians, and threw out flanking walls to defend the sloping entrance gangway and roadway more completely. Two or three generations later, when the stucco face was decayed, an entirely different system was adopted. They finally gave up the long slopes and archery defence, and made the skilled masons of Egypt build a great stone wall, with about 80,000 tons of the finest limestone, in large blocks from the Mokattam Hills, 25 miles distant. This wall was 45ft. high, 6ft. thick, and over a mile long; it was built outside of the bank, which thus ceased to have any slope and became a walled city. This probably was the celebrated Hyksos capital of Avaris.

The Hyksos Kings appeared to have been Semites, who came from the region between Syria and Mesopotamia, and pushed forward into Egypt and Cyprus.

Notes on Competitions

Lydney Cottage Hospital.

Premiums of £5 and £2 for designers placed first and second respectively, are offered by Lydney, in Gloucestershire, in a competition for a Cottage Hospital which is to cost £1,000. An additional £20 will be paid to the successful competitor *in the event of the building being erected from his plans.* "This is to include the said plans with full and adequate working drawings and specification. The said drawings and specifications to become the property of the Building Committee." This is most interesting. The only solid chances are the premiums, for the payment of the additional £20 to the successful competitor is dependent upon the caprice of the Building Committee, who, no doubt, will constitute themselves the sole judges of the fitness of the design for execution, which execution, it is evident, they intend to perform themselves. As may be assumed from conditions of this sort there is to be no professional assessor. It is lamentable that Lydney could not have found other means of having this trifling work carried out than by competition. Surely there are competent architects in Gloucestershire who would not consider a work of this size too small for acceptance.

The New County Hall, London.

Time does not dispel the unfavourable impression which has been caused by the decision of the London County Council to make the competition for its new premises an international affair, for each day brings its quota of opinion, expressed through media either personal or public, and mostly condemnatory. The subject is one which concerns Londoners in particular. To all who love the great city in which they work, and who bear their share of the cost of administration, the news must have come as a shock that the prize which they alone should have wrestled for is now to be the object of contest, not of the whole country, but of the whole world. No city has a greater number of architects qualified and competent to be entrusted with a work of this nature than has London. Nobody has better opportunities of studying the requirements of the plan than has a Londoner. No architectural treatment is more fitting than one that shall bear the stamp of local tradition. No one is more worthy to have a hand in this great work than he who has contributed, in whatever modicum, through the county rate, towards its cost. A County Hall is a particularly local institution. In a smaller town or city than London a competition is rendered advisable in inverse ratio to the number of competent architects practising in the vicinity. In spite of this there is a growing tendency to limit competitions to their own districts, as is evident to all who have studied recent invitations to architects to compete. There are some who may consider this idea of the reservation of London's Hall for London architects a narrow one. Assuming there to be arguments in favour of an extension of the field of limitation, surely there are few who would desire to see that limit extended beyond the shores of the British Isles. It has been argued that none but a Londoner or inhabitant of these islands would stand a ghost of a chance of success. If that be so, is it reasonable or fair to extend the limit beyond the sea line ? If the assessors perform their task conscientiously, and no one for a moment would suggest that they will not, there is the possibility of a foreign design being selected. The thought of London's Hall being carried out by anybody but a Britisher is appalling. Who is responsible for this state of affairs ? Two theories have been put forward: one, that the R.I.B.A. has had something to do with the matter, having been moved to generosity as a result of the Seventh International Congress of Architects; the other, that the superintending architect of the County Council, finding that the work was not to be his, advised that the field of competition should be as wide as possible. The first of these theories is obviously untenable, for the doings of the Institute are easily ascertainable; the second is improbable or should be regarded as such in the lack of evidence to the contrary. There seems little room for doubt that the County Council, upon the recommendation of its Establishment Committee, has acted upon its own initiative. It is a matter for regret that Sir Thomas Brooke-Hitching's voice was raised in vain when he championed the cause of British architects and instanced the many fine works they have produced.

List of Competitions Open.

DATE OF DELIVERY	COMPETITION.
—	PREMISES FOR LEVEN REFORM CO-OPERATIVE SOCIETY, LTD. Particulars from D. C. Wilson, sec., on Wednesdays and Saturdays.
—	MODEL VILLAGE at Brodsworth, near Doncaster, consisting of 500 cottages, club house, and shops. Design of cottages to be submitted with plan of model village, which will cover about 70 acres. Particulars from the Brodsworth Main Colliery Co., Ltd., Duckmanton, near Chesterfield.
Aug. 18	CHURCH EXTENSION, MAESTEG, Particulars from T. Rees, secretary Bethania Chapel, Maesteg, Mon.
Aug. 21	CEMETERY AND CARETAKER'S HOUSE, STEWARTON. Particulars from James Kerr, clerk to Parish Council, Stewarton, R.S.O., Aryshire.
Sept. 20	SCHOOL AT SUNDERLAND. Limited, to local architects. Premiums of £50, £20 and £10. Particulars from John W. Moncur, borough engineer, Town Hall, Sunderland.
Sept. 21	CONVALESCENT & NURSES' HOME AT GLOSSOP. Premiums of £20 & £10. Particulars from Mr. T. W. Ellison, Town Clerk, Norfolk Chambers, Glossop.
Sept. 28	SEWAGE DISPOSAL SCHEME FOR ELLESMERE. Premium of £20. Particulars from R. E. Lloyd, Clerk to Urban District Council, Ellesmere.
Sept. 29	REBUILDING OF HENSHAW'S BLIND ASYLUM AT MANCHESTER. Limited to Manchester architects. Premiums £100, £50, and £25. Assessor, Mr. John Holden, F.R.I.B.A.
Oct. 1	ALPHABET COMPETITION. Prizes of £20, £10 and £5. For particulars see "Architectural Review."

Our Plates

The house at Tadworth is built of brick, which is covered with rough cast. The roof is tiled with a dark red tile. The whole of the external wood-work is painted with green solignum and the internal woodwork with brown, except the living and dining rooms, which will be panelled in oak to the height of the doors, with a plaster frieze above in colour. Mr. J. J. Pink, of South Merstham, is the builder.

The house in Yorkshire will be built of local stone up to the string courses, and above the walls will be treated with rough cast and half timbering, the angles of the building being carried up in stone as pilasters. Westmoreland green slates will be used for the roof covering. The whole of the external wood-work will be of oak.

The architect of both houses is Mr. J. Percy Hall, A.R.I.B.A., of 6, Victoria Grove, Kensington, W.

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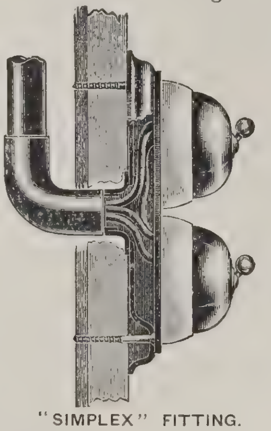
Electrical Notes.

Lifts.

Messrs. R. Waygood & Co., Ltd., of Falmouth Road, S.E., have recently published several pamphlets which it would be to the advantage of architects and others who have occasion to use lifts to study. This firm is noted for making both electric and hydraulic as well as hand-power lifts, and consequently they may be considered unbiased as to their relative merits, and to realise the possibilities of every variety of lift. They have no reason to advocate an expensive or inefficient lift of one kind because they specialise therein. One pamphlet embodies a contribution to the discussion as to the relative merits of electric and hydraulic power in the working of lifts and cranes. We notice particularly that the firm is paying special attention to the design of their lifts and lift enclosures. The cars are constructed of mahogany, teak, oak and other woods, and those of open ornamental ironwork are superior to the design we have unfortunately long been accustomed to. Another small pamphlet giving a list of the lifts for motor-cars, that have been constructed by Messrs. Waygood & Co. will be handy for those who wish to inspect such lifts, which are now becoming an important item for consideration in view of the increasing importance of the motor-car industry. Still another pamphlet deals with lifts or elevators on inclined rails, which form a feature of many of our sea-side towns for the conveyance of passengers up to the top of cliffs. This pamphlet has special reference to the two cliff lifts at Bournemouth, and to lift work generally in that town.

Conduits.

Messrs. Simplex Conduits, Ltd., have just issued a leaflet (No. 161) which deals with their new "Simplex" flush mounting boxes (patented). These are quite a novel departure in methods of mounting switches and other forms of electric lighting fixtures, and, as they are intended for concealed work, special attention has been paid in their design to reducing the depth dimension, thus minimising the channelling out of brickwork during erection. It will be found that to use these fittings in conjunction with a "Simplex" short-arm bend or tee gives the least possible depth dimension. They are finished in polished and lacquered brass, and the fact that they consist of a box in which slack wire may be coiled away and an artistic base on which the fitting may be mounted is a unique combination. We give a sectional view of the fitting herewith. In addition to the advantages enumerated above, the following claims are made:—(1) Wires totally enclosed in metal from beginning to end. (2) No plaster required to finish of walls. (3) Wireman cannot put fixing screws through circuit wires during erection. (4) Perfect insulation for switches, &c. (5) Neatest, strongest and most artistic method of mounting any form of electric light fixture.



"SIMPLEX" FITTING.

Bankruptcies.

Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver Adj.—adjudication.

DURING THE WEEK ending August 10th, thirteen failures in the building and timber trades in England and Wales weie gazetted.

R. & G. BRISLEY, builder and contractor, Dover. P.E., Guildhall, Canterbury, August 30, at 10.

J. W. BROOKS, plasterer and decorator, Eccles and Patricroft. P.E., Salford C.C., September 11, at 10.30.

E. TURNER, painter and decorator, Blackburn. P.E., Blackburn C.C., September 5, at 10.30.

COAD BROTHERS, builders, Finchley. P.E., Town Hall, Barnet, August 16, at 11.

MOIR & Co., timber merchants, Broxbourne. Adj., August 1.

C. FAIRBANK, builder, Birmingham. P.E., Birmingham C.C., August 27, at 2.

D. J. JONES, painter and decorator, Aberystwyth. First meeting, Town Hall, Aberystwyth, August 31, at 12.45 p.m. P.E., ditto at 12.30. Adj., August 1.

M. JENKINS, contractor, Port Talbot. Liabilities, £944; deficiency, £842.

BURGESS BROTHERS, builders, Westbury. Liabilities, £2,767; deficiency, £2,283.

J. W. HAWKINS, builder and auctioneer, London. Unsecured liabilities, £1,193; assets, £27.

C. W. CAMPION, plumber, Chelmsford. Liabilities, £2,696; assets, £666; deficiency, £2,029.

S. BOOTH, builders' merchant, Stockton Heath. Gross liabilities, £2,750.

J. SALTER, bricklayer, Attercliffe, late Wincobank. Liabilities, £224.

D. C. OAKLANDS, builder and haulier, Llantarnam Gross liabilities, £1,150; deficiency, £275.

"RALPH POWNALL," builders and timber merchants Heywood. Gross liabilities, £11,634; assets, £5,122.

Coming Events.

Monday to Saturday. August 13–18.

ARCHITECTURAL ASSOCIATION.—Annual Excursion.

Saturday, August 18.

NORTHERN ARCHITECTURAL ASSOCIATION.—Visit to the Medical College and New Grammar School, Newcastle-on-Tyne.

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"But it is not only cheap lamps that are a fertile cause of complaint, for we imagine that an electric bell that will not ring, or a telephone that refuses to act, is more annoying than a lamp that fails or blackens in a few days. . . . We are struck with the fact that there is only a matter of a few pence between the prices of the thoroughly reliable supplies listed (in the Ediswan Catalogue), and the showy but trumpery articles that are often offered as a cutting line. The recommendation of a satisfied customer is worth more than a very slightly increased profit, and one may feel perfect confidence in handling goods backed by so substantial a name as the Edison and Swan Co."

"Hardware Trades Journal."

July 27th, 1906.

Obituary.

Mr. Richard Grose, builder and undertaker, of Bodmin, died recently at the age of 72 years. Apart from his ordinary business he worked a quarry for building stone.

Mr. William Frederick Loxley, builder, of Oxford, died recently at the age of 52 years. A native of Shipston-on-Stour, he went to Oxford over 30 years ago, and for some years he had been a partner in the firm of Benfield & Loxley, builders, 106, Bullingdon Road. Among the many important contracts with which the deceased was associated may be mentioned the extension of the County Asylum at Littlemore, New College and St. John's College restoration, Magdalen School, and Lloyd's Bank Buildings.

Notes and News

A Disinfecting Station at Kensington has been erected at Wood Lane at a cost of about £7,000 from the designs of Mr William Weaver, former Borough engineer. The building contractors were Messrs. Hudson & Co., of Westminster, and the contractors for machinery &c., Messrs. Manlove, Alliott & Co., Ltd., of Nottingham.

A Correction.—Certain errors occurred in the answers to R.I.B.A. Exam. Questions in our last issue. On column 1 of page 69, in the answer to question 1 (b), for "area of bending" read "area of bearing." In column 1, page 70, in the answer to question 7, for $\frac{20 \times 20 \times 8 \times 62{\cdot}5}{112 \times 26}$ read $\frac{20 \times 20 \times 8 \times 62{\cdot}5}{112 \times 20}$. In the same column just below the above, for "each will carry half" read "each will carry $\frac{1}{9}$th of," &c. In column 3 of the same page, in reply to question 1 (3), for "portico" read "purlin."

Dangers of Building.—A departmental committee has been appointed by the Home Secretary to inquire into the dangers attendant on building operations, and to recommend regulations for safeguarding workmen. The members of the committee are Mr. William Dawkins Cramp, I.S.O., Deputy Chief Inspector of Factories (chairman), Mr. John Batchelor (Operative Bricklayers' Society), Mr. E. T. Jessup (Amalgamated Society of Carpenters and Joiners), Mr. William Shepherd (London Master Builders' Association) and Mr. Alexander H. Stenning (Surveyors' Institution). Mr. Leonard Ward, of the Home Office, will be secretary to the committee.

Glasgow Dean of Guild Court.—Mr. Thomas Mason, of Craigie Hall, Bellahouston, has been nominated for election as Lord Dean of Guild for Glasgow in the ensuing year. The election will take place in October. Along with Mr. John Morrison, Mr. Mason established in 1876 the firm of Messrs. Morrison & Mason, builders and contractors, who soon acquired a high reputation in England as well as throughout Scotland. Among the more prominent of the undertakings with which they have been entrusted may be mentioned the Glasgow Municipal Buildings, the canal line of the Glasgow and South-Western Railway, the Cathcart Railway, the new Glasgow Bridge, the tunnels and reservoirs at Craigmaddie in connection with the Glasgow water supply scheme, and the Thirlmere water supply scheme for Manchester.

Trade and Craft.

Bathrooms.

"Modern Bathrooms" is the title of a booklet illustrating a great variety of the famous "Standard" porcelain enamelled baths and one-piece lavatories, and containing useful advice with regard to planning and fitting a bathroom. A copy of "Modern Bathrooms" will be sent gratis and post free to architects, builders, or anyone interested in residence construction or refitting. "Standard" porcelain enamelled goods are so thoroughly reliable in material and in service, so artistic in finish and design—and withal so moderate in price—that their merits are worthy of consideration. Application for a copy of the booklet should be made to the Standard Sanitary Mfg. Co., Dept. G., 22, Holborn Viaduct, London, E.C., and ask for Booklet No. 7.

Waring's Annual Meeting.

At the ninth annual meeting of the shareholders in Waring & Gillow, Ltd., on August 2nd Mr. S. J. Waring, Junr., the chairman, said that 1905 was the best year which the company had yet had, not only as regards the volume of business done, but also as regards the profits earned, which were some £30,000 in excess of the preceding year. During the nine years of the company's existence there had been a continuous and unbroken record of increasing profits, in addition to their own reserve, which now amounted to £145,000. They were also building up ample reserves in Messrs. Hampton's, the Waring-White, and other subsidiary companies. Respecting the Waring-White Building Company, in which the company held a half interest, he thought it would be generally admitted, as proved by the actual results, that it was undoubtedly the most scientific and economical building organisation in Great Britain, and had met with a degree of success which was almost phenomenal. They had always been hampered in the past by the want of space in London, and a consequent lack of concentration, owing to the scattered position of their premises. This had now been rectified, and a building had been called into existence which was without parallel for its position, and the perfection of its goods, and the organization for conducting the business which it proposes to carry out. The question had been raised, would this new departure pay? Until now this had, of course, been a problematical point, but now they were in an assured position. They were able to tell, from the experience of the past several weeks in the new premises, that not only was success attained, but he might go further and say that the expansion in the general trade was already four times greater in volume than they had calculated would be sufficient to meet the increase in expenses. And this was not merely a spasmodic leap at the outset, but a gradual and steady weekly increase of business which set in from the opening week for sales. It had been charged against them as a fault that they had introduced American methods in building construction. From the commercial standpoint, however, the successful results and the large volume of business they had secured were a good answer; but he would go further and say that, from the most patriotic and higher national standpoint, it was imperative in these days of keen international competition to fit themselves for the great commercial race by adopting every useful method, be it American or German or Japanese, and by striving with every nerve to attain the greatest efficiency in order that they could retain their supremacy.

Colouring Concrete.

The natural grey colour of concrete does not generally meet with favour, and we all know of the efforts which are made to render it more pleasing by the incorporation of pigments with the cement and aggregate in the mixing. Now that concrete is coming into such increased favour for architectural purposes, the colouring of Portland cement concrete is likely to be increasingly in vogue. Of course it is possible to apply any colour in the way of distemper or paint after a job is completed, but for external purposes this is not lasting, and a building consequently becomes expensive in upkeep. The incorporation of pigments in the concrete in manufacture has not always been successful. It has often been overdone, the colours being too virulent, and the work becomes streaky and discoloured from the effects of rain and soot, while the colours often fade or discolour after a short period. The first two difficulties are overcome by the exercise of just a little commonsense and care, and are not traceable to inherent defects in the pigment. The last trouble, however, is caused by using an unsuitable pigment. There is lime in Portland cement which we all know destroys or seriously affects the colour of many pigments; others do not weather well. Of course, it is obviously foolish to expect a vegetable pigment to be of any service; if not destroyed by the cement, it will quickly lose its colour in the open air. The chemical action of the cement in setting is one which will affect all pigments except those which are inert, basic or alkaline. The oxides or iron are, on the whole, cheapest and most preferable. They should be obtained from a reliable manufacturer. Abroad, especially in Germany, Belgium and Scandinavia, artificial stone in various colours is largely manufactured, and also Dutch tiles and glazed roofing tiles are made with Portland cement coloured. In Italy, of course, the practice of colouring cement concrete has been practised for centuries. The importance of the industry abroad has led manufacturers to lay themselves out specially to manufacture colours suitable for the purpose. Such colours have been made for more than 100 years by the colour works of S. H. Cohn, of Berlin, who have recently opened a branch in England, at 27 and 28, King William Street, London, E.C. The advantages thus afforded manufacturers, architects, contractors and others of obtaining colours suitable for admixture with cements or lime will, no doubt, be appreciated.

Ruberoid.—Messrs. Robert W. Blackwell & Co., Ltd., have disposed of the departments of their business for the sale of Ruberoid roofing, dampcourses, "P. & B." building and insulating papers, and "Giant" building and damp-proof papers, to Messrs. the Ruberoid Co., Ltd., of Waterloo House, 81-83, Knightrider Street, London, E.C. Mr. Edgar R. James, late joint managing director of Messrs. Blackwell & Co., is managing director of the Ruberoid Co.

Complete List of Contracts Open.

WITH a few exceptions, news of Contracts Open are not repeated after they have been published once in these columns, so that readers will find particulars in our previous issues of other contracts that still remain open.

Unless expressly stated to the contrary, all deposits required for bills of quantities, &c., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair-wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

August 16. Dalton-le-Dale.—*Restoration of the Parish Church of Dalton-le-Dale*, near Sunderland. Intending contractors may inspect the plans and specification on application at "The Glebe House, Dalton-le-Dale," up to August 16, when tenders are to be sent to C. H. Fowler, architect, The College, Durham. Sole tenders only will be received. Quantities on written promise to submit a sole tender, may be obtained of W. Morton, quantity surveyor, 27, John Street, Sunderland.

August 16. Doddington.—*Alteration and enlargement of the County School* at Doddington, near Faversham, Kent. The enlargement will provide accommodation for about 38 children Drawings and specifications, prepared by W. H. Robinson, M.S.A. (architect to the Committee), may be inspected at the Office of the Committee, 44, Bedford Row, London, W C., between the hours of 10 a.m. and 4 p.m., or at the School. Any person desiring to tender and to receive a copy of the bills of quantities must send in his name to the Committee, accompanied with a deposit of £1. The contractor will be required to have the enlargement and alteration advanced sufficiently to enable the School being opened on the 2nd October, 1906. Tenders on the form supplied to be delivered to Miss Margaret Elvy, Champion Court, Newnham, Sittingbourne, not later than noon on August 16.

Aug. 17. St. Austell.—*Erecting new secondary schools* at St. Austell, according to plans and specifications prepared by B. C. Andrew, architect to the committee, Biddick's Court, St. Austell, at whose office the plans may be seen, and all information obtained. Sealed endorsed tenders to be sent to F. R. Pascoe, secretary, Education Office, Truro, on or before August 17.

August 17. Seacombe.—*Erection of public swimming baths* at the Guinea Gap, Seacombe, for the Wallasey Urban District Council. Drawings and specifications may be seen on application to W. H. Travers, engineer and surveyor, Public Offices, Egremont, Cheshire, and bills of quantities will be supplied on payment of a sum of £3. Tenders, enclosed in official envelopes, to be forwarded per post, so as to reach H. W. Cook, clerk and solicitor, Public Offices, Egremont, Cheshire, not later than August 17

August 17. Glasgow.—*(1) Mason and brick works: (2) wright and joiner works; (3) plasterer work: (4) plumber work; (5) slater and rough casting works: (6) painter work, in connection with the tenements proposed to be erected in Winning Row*. The plans may be seen and copies of the specification, schedule of quantities and form of tender obtained, on application at the office of the City Engineer, City Chambers, 64, Cochrane Street; and sealed tenders, marked "Improvements Department—Tenements Winning Row, Offer for," must be lodged with A. W. Myles, town clerk, City Chambers, Glasgow, not later than 10 a.m. on August 17.

August 17. Treorchy.—*Additions to No. 122, Bute Street*, Treorchy, for L. Lewis, butcher, with whom plans and specifications may be seen at 114, Bute Street, Treorchy. Sealed tenders to be sent to the proprietor on or before noon of August 17.

August 18. Belfast.—*Extensions to the premises of Messrs. R. Watson & Co., of Belfast, Ltd.*, of Donegall Street, according to the plans, specification, and conditions of contract to be seen of W. J. Fennell, architect, 2, Wellington Place, Belfast. Bills of quantities can be obtained from M'Carthy & Brookes, surveyors, Scottish Provident Buildings. Tenders to be sent to the architect on or before August 18.

August 20. Hitchin.—*Erection of new stables* at Victoria Road, Hitchin, for G. Maidment. Plans and specifications may be seen of J. Shilcock, architect, Hitchin, between the hours of 10 and 5 (except Saturday). Sealed and endorsed tenders to be sent to him on or before August 20, at 12 o'clock.

August 20. Rhymney.—*Erection of proposed villa residence at Rhymney for Councillor John Edwards*. Drawings and specifications may be seen, and further particulars obtained from James & Morgan, FF.R.I.B.A., architect, Charles Street Chambers, Cardiff. Tenders, sealed and endorsed, to be delivered to Councillor Edwards not later than Monday, August 20.

August 20. Blackdown. — *Erection of an engine house and pair of cottages at the pumping station, on Blackdown, near Haslemere.*—The specification and drawings can be seen and schedules of quantities and forms of tender can be obtained at the offices of R. B. Grantham & Son, 23, Northumberland Avenue, London, W.C., on payment of a deposit of £3 3s. Sealed tenders, which must be on the prescribed form, and endorsed "Haslemere Water Works," must be sent to F. Smallpeice, clerk to the Council, Guildford, on or before August 20.

August 20. Dublin.—*The following works in connection with the new motor-car shed at Amiens Street Terminus, Dublin*, for the Great Northern Railway Co. (Ireland). Contract No. 1: Three timber smoke troughs, each 126ft, long. Contract No. 2: Slating of roof. Parties wishing to tender for the works may see the respective drawings and specifications at the office of W. H. Mills, engineer-in-chief, Amiens Street, Dublin; or copies of them at the office of the District Engineer, Belfast; and can obtain at the said offices forms of tender for each contract on payment of 1s. each. Tenders made out on the forms supplied by the company, and endorsed respectively "Tender for Smoke Troughs" and "Tender for Slating," should be delivered to T. Morrison, Secretary's Office, Amiens Street Terminus, Dublin, not later than 10 a.m. on August 20.

August 20. Belfast.—*Erection of a new school and matron's residence* in Lancaster Street, Belfast, for the trustees of the ladies' industrial school. Bills of quantities may be obtained from A. Ferguson, Scottish Provident Buildings, on payment of a deposit of £2 2s. Plans and specification may be had of Blackwood and Jury, M.R.I.A., Architects, 41, Donegall Place, Belfast. Sealed and endorsed Tenders to be lodged with the Architects, on or before 5 o'clock on August 20.

August 21. Sheffield.—*Underground conveniences adjoining the town hall in Surrey Street* for the health committee. Specification and plans may be seen and quantities obtained at the office of F. Wike, C.E. city surveyor, town hall, Sheffield, on payment of £1 1s. Tenders, endorsed "Town Hall Conveniences" are to be sent in not later than 6 p.m. on Tuesday, August 21, addressed to "The Chairman and Members of the Health Committee, City Surveyor's Office, Town Hall, Sheffield." Fair wages clause.

August 21. Bangor.—*Erection of a New Free Library at Bangor, North Wales*. Bills of quantities may be obtained and plans and specification may be seen by application to Dixon & Potter, architects, 65, King Street, Manchester. A deposit of £2 will be required from each applicant for a copy of the quantities. Sealed tenders, endorsed "Free Library," to be sent not later than August 21, to the Chairman of the General Purposes Committee, Health Department, Municipal Offices, Bangor.

August 21. Caerphilly.—*Erection of a public slaughter-house and other contingent works at Taff's Well*. Plans and specifications may be seen and schedule of quantities and form of tender obtained at the Council Offices, Caerphilly, upon deposit of £2 2s. Tenders to be endorsed "Slaughter House" addressed to Chairman of Council and delivered at Council Offices, Caerphilly, not later than August 21.

August 21. Sheffield.—*Underground conveniences adjoining the Town Hall in Surrey Street* for the Health Committee. Specification and plans may be seen and quantities obtained at the office of C. F. Wike, C.E., city surveyor, Town Hall, Sheffield, on payment of £1 1s. Tenders, endorsed "Town Hall Conveniences," are to be sent in not later than 6 p.m. on August 21, addressed to "The Chairman and Members of the Health Committee, City Surveyor's office, Town Hall, Sheffield." A fair wages clause.

August 22.—London, N.—*Alterations at additional workhouse*, Hazelville Road, Hornsey Rise. N., lately known as the "Alexandra Orphanage," for the Guardians of the Poor. The specifications can be seen and all information obtained at the office of F. J. Smith, Esq., F.R.I.B.A., Parliament Mansions. Victoria Street, S.W., upon the payment of £5. Sealed tenders, upon the forms supplied, must be delivered to the Guardians, at their meeting to be held at the Board Room, 204, Hoxton Street, N., on August 22, at 5 p.m.

August 23. Bedale.—*Building New Wesleyan Sunday School*. Plans and specifications to be seen at the house of F. Gatenby, Bedale. Sealed tenders to be sent to Mr. Gatenby not later than August 23.

August 23. Manchester.—*Quantity of pointing at Workhouse*, Delaunays Road, Crumpsall, for the Preston Union. Specifications may be obtained at the Workhouse, between 10 and 12 o'clock. Tenders, endorsed "Tender for Pointing," to be addressed to E. W. Ogden, clerk to the Guardians, Union Offices, Cheetham Hill Road, Manchester, and delivered by 10 a.m. on August 23.

August 23. Mablethorpe.—*Additions to the Council School at Mablethorpe*. Bills of quantities and form of tender may be had on application to Scorer & Gamble, architects, Bank Street Chambers, Lincoln, and on payment to them of £1 1s. The drawings and conditions of contract may be inspected at the offices of the architects. Tenders must be delivered to S. M. Grant, secretary, 286, High Street, Lincoln, in the envelope provided for that purpose, before 10 a.m. on August 23.

August 23. Sutton-on-Sea.—*Demolition of the existing lifeboat house* adjoining the Promenade at Sutton-on-Sea, and the construction of an enlarged boathouse on the same site, for the Royal National Life-boat Institution. Contract drawings, terms and conditions of contract, and specification may be seen on application to B. Simons, hon. secretary, Sutton-on-Sea, or at the office of W. T. Douglass, engineer and architect to the Royal National Lifeboat Instituton, 15, Victoria Street, Westminster, London, S.W. Copies of the form of tender, conditions of contract, and bills of quantities may be obtained on application to the Engineer and Architect upon deposit of £1 1s. Copies of certain of the plans may be obtained from the Engineer and Architect on payment of 2s. 6d., which sum is non-returnable. Sealed tenders, which will only be received on the form supplied, endorsed "Tender for the Reconstruction of Lifeboat Station, Sutton-on-Sea," to be delivered to the Hon. Secretary at Willoughby, Alford, Lincolnshire, at or before 10 a.m. on August 23.

August 24. Glenkindie.—*Mason, carpenter, slater, plumber, plaster, and painter works of new schoolhouse to be erected at Glenkindie* for the Tawie parish school board. The plan and specifications can be seen with A. Taylor, Castle Cottage, Kildrummy, with whom sealed offers, endorsed "Tender for Schoolhouse," are to be lodged not later than August 24.

August 24. London, S.E.—*Erection of a new sorting office at Greenwich* for the Commissioners of H.M. Works and Public Buildings. Drawings, specification, and a copy of the conditions and form of contract may be seen on application to J. Wager H.M. Office of Works, Storey's Gate, S.W. Bills of quantities and forms of tender may be obtained at the under-mentioned address on payment of £1 1s. Tenders must be delivered before 12 o'clock noon on August 24, addressed to the Secretary, H.M. Office of Works, &c., Storey's Gate, London, S.W., and endorsed "Tender for Greenwich Sorting Office."

August 25. Swindon.—*Erection of schoolroom for Primitive Methodist trustees*, Upper Stratton, Swindon. Specifications and plans are deposited with S. Fry, 152, Cricklade Road, Swindon. Sealed tenders to be sent to M. Ford, the Farm, Upper Stratton, Swindon, not later than August 25.

August 25. Edinburgh.—*Additions to the Royal Victoria Hospital for Consumption, Edinburgh*. Applications for schedules must be lodged with Sydney Mitchell & Wilson, architects, 13, Young Street, Edinburgh. Schedules will be forwarded as soon as they are ready, and tenders must be lodged with the architects not later than August 25.

August 25. Abergavenny.—*Making additions and extensive improvements to the Cardiff Arms, Abergavenny: also for the building of new stores, stabling, and other works for the Hereford and Tredegar Brewery Co., Ltd., Hereford*. Plans and specifications may be seen and further particulars and forms of tender obtained of B, J. Francis, architect, Abergavenny. Tenders, sealed and endorsed, to be sent to the architect not later than August 25.

August 25. Newport.—*Additions and alterations* for the Isle of Wight County Education Committee at the Technical Institute, Newport. Plans and specifications may be seen at the County Education Offices, Newport, I.W., or at the office of the architect, 5, St. Thomas's Street, Ryde, I.W., where all information may be obtained. Sealed tenders, endorsed "Technical Institute," must reach F. G. Flux, County Education Offices, Newport, I.W., on or before August 25.

Sept. 3. Fife. — *Erection of joint infectious diseases hospital* near St. Michael's, Leuchars, Fife. Applications for schedules must be lodged with W. Carruthers Laidlaw, architect, 4, York Buildings, Edinburgh, from whom schedules can be obtained on payment of a deposit of £1. All tenders must be lodged with the architect not later than Sept. 3.

September 3. Castleblayney.—*Erection of a goods store (90ft. × 25ft.) and Office (20ft. × 14ft.)* of timber, with galvanised corrugated iron roof, &c., at their Castleblaney Station, for the Directors of the Great Northern Ry. Co. (Ireland). Parties wishing to tender may see the drawing and specification at the office of W. H. Mills, Engineer-in-Chief, Amiens Street Terminus, Dublin, or copies of them at the office of the District Engineer, Belfast, and forms of tender can be obtained at either of the said offices on payment of 1s. each. Tenders made out on the forms supplied by the Company, and endorsed "Tender for Goods Store," should be delivered to T. Morrison (Secretary), Secretary's Office, Amiens Street Terminus, Dublin, not later than 10 a.m. on September 3.

Sept. 4. Lochmaben.—*Erection of the Lochmaben Combination Hospital* for the Board of Directors. Plans may be seen with, and schedules obtained from F. Carruthers, Esq., architect, 35, Buccleuch Street, Dumfries, on payment of £1 1s. Mr. Carruthers will meet intending contractors at the Town Hall, Lochmaben, on August 28, between the hours of 11 a.m. and 3 p.m.; and all tenders must be lodged with John Ford Cormack, solicitor, Lockerbie, clerk to the Combination, on or before September 4.

Sept. 4. London, W.—*Execution of ordinary works and repairs to buildings, &c.*, in the charge of the Commissioners of His Majesty's Works and Public Buildings in the London district for three and a half years from October 1, 1906. The printed schedule, with form of tender, may be obtained at His Majesty's Office of Works, Storey's Gate, Westminster, between the hours of 11 a.m. and 5 p.m., upon payment of £1. Tenders must be delivered before 12 o'clock noon on Sept. 4, addressed to the Secretary, H.M. Office of Works, Storey's Gate, London, S.W., and endorsed "Tender for Ordinary Works and Repairs, London."

Sept. 5. Manchester. — *Erection of the Domett Street Municipal School, Blackley, Manchester*. Plans may be seen and a copy of the bills of quantities (including specification) may be obtained at the Education Offices, Deansgate, Manchester, on a deposit of £2 2s. Tenders, on the official forms, and enclosed in the envelopes provided, must be delivered not later than September 5. Cheques to be made payable to the Accountant, Education Offices, Deansgate, Manchester,

Sept. 5. Manchester.—*Alterations and additions to the Abbott Street Municipal School, Rochdale Road, Manchester*. Plans may be seen and a copy of the bill of quantities (including specification) may be obtained at the Education Offices, Deansgate, Manchester, on a deposit of £2 2s. Tenders, on the official forms and enclosed in the envelopes provided, must be delivered not later than Sept. 5. Cheques to be made payable to the Accountant, Education Offices, Deansgate, Manchester.

September 10. Salford.—*Extensions to car depot and workshops* for the Tramways Committee. Contract 145, constructional steelwork; contract 146, builders' work, in their erection and completion of extensions to the Central Car Depot, Frederick Road, Pendleton. Forms of tender and bills of quantities for either contract may be obtained on application to the General

Manager, Tramways Department, 32, Blackfriars Street, Salford, upon depositing a cheque for £2 2s. Plans can be inspected and further particulars obtained at the above-mentioned offices. Tenders endorsed "Steelwork" (or "Buiders' Work" as the case may be) "Car Depot Extensions," and addressed to the Chairman, Tramways Committee, Town Hall, Salford, must be delivered to L. C. Evans, town clerk, Town Hall, Salford, not later than 3 p.m. on September 10.

Sept. 11. Manchester.—*Execution of Alterations at the Benton Technical Institute* for the Lancs. Education Committee. The plans may be seen and bills of quantities obtained at the offices of J. W. Beaumont & Son, 10, St. James's Square, Manchester. Tenders must be delivered before 12 o'clock noon on September 11, sealed and endorsed, to W. F. Knott. Parish Offices, Ashton-under-Lyne.

Sept. 12. Merthyr Tydfil.—*Additions and improvements* to Bethesda Congregational Chapel, Merthyr Tydfil. The plans and specifications can be seen with Mr. Rees Jones, grocer, Bethesda Street. The tenders to be sent, sealed and endorsed, to J. Thomas, 90, Brecon Road, Merthyr Tydfil, not later than September 12.

Sept. 27. London, E. — *Additions and alterations in the building at the Electricity Works*, Osborn Street, Whitechapel, E. Persons tendering must submit the names and addresses of two substantial persons willing to be jointly and severally bound for the due and proper performance of the contract. Fair wages clause. The drawings may be seen and copies of the stipulations, specification, schedule, and form of tender may be obtained by applying to M. W. Jameson, A.M.Inst.C.E., borough engineer, 15, Great Alie Street, Whitechapel, E., between the hours of 10 a.m. and 12 noon, upon paying £5. Tenders, endorsed "Tenders for Additions to Electricity Buildings," should be sent to G. W. Clarke, town clerk, 15, Great Alie Street, Whitechapel. E., in the envelopes supplied, so as arrive at this office on before 12 o'clock noon on September 27.

No date. Belfast.—*Erection and completion of business premises in North Street, Belfast.*—The plans and specifications and all information can be obtained at the offices of J. J. M'Donnell, 27, Chichester Street, Belfast.

ENGINEERING.

August 18. Perigneux (France).—*Construction of an iron bridge* over the river Dronne at Saint Aulaye, 31,200 francs. Deposit, 1,000 francs. Specifications and forms of tender may be had on application to Prefecture de la Dordogne, Perigneux. Tenders must be delivered by August 18.

August 18. Penrith.—*Improvement of the arch of the Dyer's Beck Bridge, Lazonby, and removing and re-building about 25 roods of walling* for the Rural District Council. The Council's surveyor, Thomas Watson, Kirkoswald, will meet intending contractors on the place on August 10 & 11, at 10.30 a.m., when specifications may be obtained. Tenders to be sent to J. W. Smith, clerk, Penrith, on or before Aug. 18.

August 20. Lidgate.—*Rebuilding a bridge at Lidgate, Suffolk*, for the Moulton R.D.C. The plans and specifications can be seen at the offices of Holland & Sons, High Street, Newmarket. Sealed tenders to be sent to S. J. Ennison, clerk to the Council, Deva Chambers, Newmarket, not later than 10 o'clock in the forenoon of August 20, endorsed "Tender for Lidgate Bridge."

August 21. Belfast.—*Fitting up and Completing five baths and the heating by steam of a dormitory* at Girls' School department of the Workhouse, in accordance with plan and specification prepared by Young & Mackenzie, civil engineers, which can be seen at the Clerk's Office, Union Workhouse, Belfast Tenders, endorsed "Baths," to be lodged in the Tender-Box, Boardroom, before 12 o'clock noon on August 21. Security for the due performance of the contract will be required.

August 21. Caversham.—*Alterations to existing works and the erection of additional septic tanks and continuous filters* in connection with their Sewage Disposal Works for the Urban District Council. General conditions, specifications, bills of quantities, and forms of tender may be obtained and drawings inspected at the Surveyor's office, 11, Bridge Street, Caversham, upon receipt of a deposit of £2 2s. Sealed tenders, endorsed "Caversham Sewage Disposal Works—Contract No. 2, "must be delivered to A. J. Smith, engineer and surveyor, Council Offices, 11, Bridge Street, Caversham, not later than August 21.

August 22. Weston-super-Mare. — *Supply for the next six months* for the Weston-super-Mare and District Electric Supply Company, Ltd., of (1) feeder and distributor cables, (2) joint boxes, feeder pillars, and other accessories. Specifications may be obtained at the offices of the company, Locking Road, Weston-super-Mare, and must be forwarded to the same address not later than August 22.

August 23. Manchester. — *Erection of a Photometer House and extension of coal sheds at their Droylsden Station*. Specification, bill of quantities, and tender form may be obtained on application to C. Nickson, superintendent, Gas Offices, Town Hall, Manchester. The drawings may be seen and other information may be obtained on application to J. G. Newbigging, M.Inst.C.E., engineer, at his office, Rochdale Road Gas Works. Sealed tenders, enclosed in official envelope, and addressed to "The Chairman of the Gas Committee," Town Hall, Manchester, to be delivered not later than 10 a.m. on August 23.

August 24. Aberdeen.—*Construction of a timber jetty*, about 435 feet long and 30 feet wide, and relative works, on the South Side of Albert Basin, within the Port of Aberdeen. The contract drawings may be seen at the offices of R. G. Nicol, engineer, at the Engineer's Office, Aberdeen, between the hours of 10 a.m. and 4 p.m., and copies of the specification, schedule of quantities, and general plan and sections obtained on payment of £2 2s. Tenders, endorsed "Tender for Timber Jetty, Albert Basin," are to be lodged with the Engineer not later than 12 o'clock noon on August 24.

August 28. Fairfield.—*Construction of a concrete storage reservoir* at Turner Lodge, Fairfield, near Buxton, to hold 4,000,000 gallons. Drawings may be seen, and copy of specification, bill of quantities, and form of tender obtained at the offices of Swann and Brady, engineers, Town Hall, Chapel-en-le-Frith, via Stockport, on payment of £2 2s. Sealed tenders, endorsed "Tender for Reservoir," to be delivered to C. Slater, Council Offices, Fairfield, Derbyshire, on or before August 28.

August 28. London, S.E.—*Providing and fixing of abont 170 yards of 3 in. to 5 in. steam pipe with valves and accessories*, at Workhouse, Renfrew Road, Lower Kennington Lane, S.E., for the Guardians of the Poor of the Parish of Lambeth. Specification and form of tender can be obtained from George E. Arnold, consulting engineer to the Guardians, 195, Kennington Road, S.E., and form of contract can be seen at that address. Tenders must be sent by post not later than August 28, to W. Thurnall, clerk to the Guardians, Guardians' Board Room and Offices, Brook Street, Kennington Road, S.E., sealed and superscribed "Tender for Steam Pipes."

Sept. 1. Zamora (Spain).—*Construction of a bridge* over the Tera river, 117,609 pesetas. General information and specifications may be had on application to Conseil-General de la Province, Zamora. Tenders must be delivered by Sept. 1.

Sept. 1. Glasgow.—*Supply, delivery, and erection, under one contract, of the whole of the machinery and accessories required for the mechanical equipment of the machinery buildings* at Shieldhall out-fall works. Specifications and forms of tender may be had on application at the office of Public Works, City Chambers, 64, Cockrane Street, Glasgow, by depositing the sum of £10 10s. Plans and drawings may be seen and further particulars obtained at the office of W. D. Hamilton, Consulting Engineer, 59, Bath Street, Glasgow. Tenders, marked outside "Tender for Sewage Disposal Machinery, Shieldhall," must be lodged with A. W. Myles, Town Clerk, City Chambers, Glasgow, on or before September 1.

Sept. 4. Lancaster. — *Proposed re-construction of steam heating arrangements* and hot water service at County Lunatic Asylum, Lancaster. Tenders to be sent by September 4th (extended date) to J. T. Cheetham, clerk and steward.

Sept. 15. Handsworth.—*Supply and fixing* of the following for the Urban District Council:—Wiring, fittings, &c., for the electric lighting of the new Council schools, Canterbury Road, Handsworth; wiring, fittings, &c., for the electric lighting of the new Council schools, Westminster Road, Handsworth. Drawings, specifications, and conditions of contract may be obtained on and after Saturday, Sept. 1, from F. A. Nixon, electrical engineer, Generating Station, Soho Road, Handsworth, on payment on £1 1s, All drawings, specification and conditions of contract must be forwarded with tender. Tenders, on the prescribed form, must be forwarded in the endorsed envelope supplied for that purpose, and should be delivered at the Education Offices not later than Sept. 15. Fair wages clause.

Sept. 24. Jassy—Roumania.—*Water supply and sewerage of the City of Jassy.*—The estimated cost is as follows: Water Supply: For Earthworks, Subterranean Galleries, c., 271,486.40f.; Iron Mains, &c., from the source to the City, a distance of 91 kilometres, 6,470,000.00f.; Distribution in the City, 1,159,914.79f.; for Reservoirs in the City, 646,000.00f.; Total, 8,547,401.19f. Sewerage: For Main Sewers, Gullies, &c., total, 1,887,607.20f. The works will be let in one contract only, but separate tenders must be submitted for each work, showing the percentage over or under schedule prices. A guarantee of 4 per cent. of the total value must be deposited with the tenders, and an additional 2 per cent. on the signing of the contract. Payments will be made monthly in Roumanian money, on materials delivered and works completed. Plans and specifications may be seen, and all further information obtained at the Chief Engineer's Office, Town Hall, Jassy. Tenders to be delivered on or before September 24.

Sept. 28. South Shields.—*Warming and ventilation, on the Plenum system*, of a block of four school departments, accommodating a total of 1,950 scholars, to be erected on the site of the Mowbray Council School, South Shields, subject to the approval of the plans for the same by the Board of Education and the Local Government Board. The plans may be inspected and further particulars will be supplied at the offices of Henry Grieves, A.R.I.B.A., architect, Albany Chambers, King Street, South Shields, to whom draft schemes and estimates must be delivered not later than September 28.

IRON AND STEEL.

August 20. London, S.W.—*Supply, delivery, and erection complete, at the depot Queen's Road, Wimbledon, of a cart shed*, about 165ft. long by 30ft. span, with open sides, and consisting of galvanised corrugated iron roofing, steel roof trusses, and rolled steel stanchions, for the Corporation of Wimbledon. Detailed plans and specification may be inspected and forms of tender obtained on application to the Borough Engineer and Surveyor, Town Hall, Wimbledon. Sealed tenders, on the forms and enclosed in the envelopes provided, to be delivered at the Town Hall on or before noon on August 20.

August 23. Hague (Holland).—*Supply of iron-work for two bridges* and springs for railway carriages. Specifications, &c., may be obtained on application to Minister for the Colonies, The Hague. Tenders must be delivered by August 23.

PAINTING AND PLUMBING.

August 18. Kirkcaldy.—*Painter work at the Cottage Hospital* for the Managers of the Kirkcaldy Cottage Hospital. Copies of the specification can be obtained upon application to W. L. Macindoe, hon. secretary-treasurer, where tenders are to be left not later than August 18.

August 20. Dartford.—*Painting and colouring the exterior of certain of the Workhouse Buildings and Children's Home, Manor Gate*, in accordance with a specification which may be seen at the office of Tait & Hobbs, Architects, Dartford, or the Master of the Workhouse. Tenders to be delivered, endorsed, "Tender for Painting," to J. C. Hayward, Clerk, Union Offices, Dartford, on or before August 20.

Aug. 22. Sheffield.—*Painting the wood and iron work* outside certain of the buildings at the Workhouse at Fir Vale, in accordance with a specification prepared by the Clerk of Works, which may be seen and further particulars obtained on application at the Workhouse. The work will be divided into three sections, which must be tendered for separately. Fair wages clause. Tenders, marked "Painting," must be sent to A. E. Booker, clerk to the Guardians, Union Offices, Westbar, Sheffield, before 12 o'clock noon on August 22.

August 23. London, S.E.—*Cleaning, painting, colouring, and general repairs to the Relief Office and Dispensary, Royal Hill, Greenwich*, for the Guardians of the Greenwich Union. Copy of the specification will be furnished upon application to Louis Jacob, A.R.I.B.A., architect and surveyor, Globe Chambers. 493 New Cross Road, and payment of £1 deposit. Tenders to be sealed and endorsed "Tender for Painting, &c., Relief Office," directed to S. Saw and delivered at the Guardians' Offices, Greenwich Union, S.E., before August 23, on which day the same will be opened at a meeting of the Guardians.

August 25. Berwick-on-Tweed.—*Painting Certain farm buildings on the Corporation Estate.* For particulars apply to W. J. Bolam, Land Steward's Office, 42, Hide Hill, Berwick-on-Tweed, with whom tenders (to be sealed and marked "Tender for Painting") must be lodged on or before August 25.

ROADS AND CARTAGE.

August 16. Chelmsford.—*Steam rolling about 2,500 cub. yds. of road metal*—the work to be tendered for by contract, for the Rural District Council. Specification and quantities may be obtained from F. E. H. Powell, surveyor of highways, Avenue Chambers, Market Road, Chelmsford. Tenders, marked "Steam Rolling," must reach him on or before August 16.

August 17. Gillingham.—*Laying about 400 yards superficial of tar material footway and re-building wall on South side of High Street*, Gillingham. Specifications, &c., may be seen at Police Station, Gillingham, and tenders to be sent to the County Surveyor, Wimborne, on or before August 17.

August 20. Gosport. — *Making-up certain private streets known as White's Slip, Queen's Road, and Avenue Road.* Specifications may be seen and further particulars, with forms of tender, obtained at the Surveyor's office. Fair wages clause. Tenders endorsed "Tender for Private Streets," to be delivered to E. T. Palmer, clerk to the Council, Gosport, not later than noon on August 20.

August 21. London, W.—*Making-up Twyford Avenue from Creffield Road to the Great Western Railway.* Plans and specifications can be seen, and bills of quantities obtained, at 57, High Street, Acton, during office hours. Tenders to be delivered at the Council Offices, 242, High Street, Acton, W., not later than 3 p.m. on August 21. Canvassing the members of the Council, either directly or indirectly, for orders or contracts under offer will be deemed to be a disqualification.

August 22. Watford.—*Making-up the following roads:*—Sussex Road, part III. (267yds. in length); Mildred Avenue (690yds. in length), for the Urban District Council. Plans, sections and specifications may be seen, and forms of tender obtained on application to D. Waterhouse, surveyor. Tenders, duly sealed and endorsed, "Tender for Private Street Works," to reach H. M. Turner, Clerk to the Council, 14, High Street, Watford, not later than 12 o'clock noon on August 22.

August 23. Harrogate.—*Private street works* required in back roads off York Road. The specification may be seen and quantities obtained of F. Bagshaw, borough engineer and surveyor. Tenders must be submitted not later than 9 a.m. on August 23.

August 25.—Bromley.—*Supply of field-picked flints, granite, and ragstone of approved quality, and for the carting of gravel* for the Bromley Rural District Council from the date of the execution of the contract to the 30th September, 1907, for the under-mentioned Parishes: Chelsfield, Cudham, Downe, Farnborough, Hayes, Keston, Knockholt, Mottingham, North Cray, Orpington, St. Mary Cray, St. Paul's Cray, West Wickham. Separate tenders must be made in respect of each item as separately numbered on the form of tender relating to each parish. Tenders to be delivered to E. Hazlehurst, clerk to the Council, Park House, Bromley, Kent, prepaid not later than 1 o'clock on August 25. Forms of tender may be obtained at the offices of the Council, and no other forms will be accepted.

August 25. Bedwellty.—*Construction of a new road* across the Landslip near New Tredegar, for the Urban District Council. Plans and specification may be seen and forms of tender obtained on application to J. H. Lewis, Assoc.M.Inst.C.E., Council's surveyor, Blackwood, Mon., upon payment of a fee of £1 1s. The surveyor will meet intending contractors on the site by appointment. The contractor whose tender is accepted will be required to enter into a contract and bond, with two sureties, for the due and faithful performance thereof, and to pay the cost of same, amounting to £3, to include the necessary stamp duties. Sealed tenders, endorsed "Tender for New Road," to be delivered to T. J. Thomas, clerk to the Council, Bargoed, Glams., on or before August 25.

No Date. Steyning.—*Hire of two 10-ton Steam Road Rollers.* Particulars and forms of tender can be obtained from F. Slaughter, Surveyor to the Council High Street, Steyning.

Sept. 1. Loughton.—*Supply of the following* for the Urban District Council: — Granite, 300 tons, broken to 1½in., delivered in quantities as desired, free at Loughton or Chigwell Lane Railway Stations (G.E.R.): Gravel—500 yards clean gravel, delivered at Loughton when and where required; Hoggin and Destructor Clinker, 50 yards of each, delivered to Loughton Station in 5-ton truck loads. The District Surveyor to the Council will supply all information required. Tenders, marked on the outside "Materials," must be delivered to J. H. Hayward, Council Offices, Loughton, Essex, not later than 12 o'clock noon on September 1.

Sept. 10. London, N.—*Sewering, levelling, paving, metalling, kerbing, channelling, and making good avenue mews, Briston Grove, and Warner Road* (1st section), Hornsey. Forms of tender, &c., and particulars can be obtained from E. J. Lovegrove, borough engineer and surveyor, Municipal Offices, Highgate, on any morning between 10 and 12 o'clock. Tenders must be on the prescribed form, and delivered, or sent by post (sealed and endorsed), so as to be received in the Town Clerk's Office, 99, Southwood Lane, Highgate, N., by 4 p.m., September 10. Quantities, duly completed, must accompany the tenders.

Sept. 10. Harpenden.—*Draining, levelling, paving, metalling, kerbing, channelling and making good Douglas Road, Harpenden*, for the Urban District Council. Plans, sections, specifications of works and materials, and general conditions may be seen between the hours of 9,30 and 10.30 a.m., and bills of quantities and forms of tender may be obtained on deposit of cheque for £1 1s. upon application to John H. Leverton, surveyor, the Public Hall, Harpenden. Sealed tenders, together with fully-priced quantities, endorsed "Tender for Private Street Works," to be delivered to C. S. Tuckey, clerk to the Council, High Street, Harpenden, before noon on Sept. 10.

Sept. 12. Kingston-upon-Thames.—*Supply of 1,250 tons of Quenast, Guernsey or other granite suitable for road making*, the whole of such granite to be broken so as to pass through a ring having a 1½in. internal diameter. The above size will be strictly enforced. Tenders to be on forms to be obtained of the Borough Surveyor, at the Municipal Offices, where samples must be left. Sealed tenders, endorsed, to be delivered to H. A. Winser, Town Clerk's Office, Kingston-upon-Thames, on or before September 12.

SANITARY.

August 16. Morley.—*Construction of concrete sewage tanks and filter beds*, &c., at Springfield Mills, Morley. The plans and specifications may be seen and bills of quantities obtained at our offices until August 16, on which day tenders are to be delivered to Kirk & Sons, architects and surveyors, Dewsbury (free of charge), before 3 o'clock p.m.

August 18. Portsoy.—*Opening and re-filling of about four miles of pipe track: supplying, laying and jointing fireclay and iron pipes, from 5 to 16 inches in diameter: building of manholes, flushing tanks and other relative works.* Drawings and specifications may be seen with, and schedules of quantities obtained from, J. Young, town clerk, Portsoy, or from David J. Reid, civil engineer, Inverness. Sealed offers, marked "Tender for Drainage Works," to be lodged with the Town Clerk not later than August 18.

August 21. Uppingham.—*Laying about 550 yards of 9in. glazed stoneware pipe sewer*, with junctions, manholes, and ventilating shafts, at Glaston, in the above district, for the Uppingham Rural District Council. Forms of specification, with plan and section, may be seen by appointment with F. R. Chapman, A.R.S.I., sanitary surveyor, Glaston Road, Uppingham. Tenders to be sent to Mr. Oakley, clerk, Uppingham, on or before August 21 next, for the Council's acceptance.

August 25. Stansted.—*Provision, laying, and jointing about 641 yards of 9-in. stoneware sewer and about 1,254 yards of 6-in., together with all all manholes and lampholes*, for the Rural District Council, in accordance with the plans, sections, and detailed drawings prepared by the Surveyor. Plans and specifications may be seen at the Central Hall, Stansted, Essex, and further particulars to be obtained from E. J. Watts, surveyor, Thorley, Bishop's Stortford. Sealed tenders, endorsed "Stansted Sewers," to be delivered to A. G. Gwynn, Central Offices, North Street, Bishop's Stortford, not later than 12 o'clock noon on August 25.

August 28. Morecambe. — *Construction of certain intended stoneware and cast-iron pipe sewers* in connection with the sewerage works of the town of Morecambe, for the Borough Town Council, together with manholes, ventilators, connections, and other works, the whole to be let in one contract. Drawings and specification may be seen at the offices of Beesley, Son & Nicholls, MM.Inst.C.E., engineers, of 11, Victoria Street, Westminster, S.W., where also specification, bills of quantities, and forms of tender can be obtained on deposit of £5. Copies of the plans and specification may also be seen at Town Hall, Morecambe. Sealed tenders, addressed to W. Tilly, and endorsed "Sewerage Works, Contract No. 3," are to be delivered at the Town Hall, Morecambe, before 10 a.m. on August 28.

September 6. Surbiton, Surrey.—*Construction of main drainage works* for the Urban District Council, subject to the sanction of the Local Government Board. The drawings, specifications, bills of quantities, and forms of tender, may be inspected at the offices of Nicholson-Lailey, M.Inst.C.E., engineer, 53, Victoria Street, Westminster, between 10 a.m. and 5 p.m. (Saturdays excepted), until September 3. Tenders, sealed and endorsed "Surbiton Main Drainage," are to be addressed to F. J. Bell, deputy clerk, Surbiton Urban District Council Offices, Ewell Road, Surbiton, and delivered on September 6 by 12 o'clock noon. A deposit of £10 Bank of England note will be required.

TIMBER.

August 21. London, N.—*Supply of 100 fathoms of best yellow Baltic deal and batten ends*, to be delivered at the Edmonton Workhouse, for the Guardians. The firewood to be not less than 18ins. in length and all square edge. Anything under 18ins., round-edged pieces, or inferior wood will be rejected. The accepted firewood will be stacked by the Guardians, and only the measurement acknowledged after it has been examined and stacked on the premises at the Workhouse, Upper Edmonton. Sealed tenders, endorsed "Tender for Firewood," upon forms to be obtained from F. Shelton, clerk, Lower Tottenham, much reach him on or before August 21.

MISCELLANEOUS.

Sept. 11. Newcastle-on-Tyne. — *Supply of rails, points, and crossings, together with the necessary fishplates, tie-rods, bolts, and nuts*, in connection with the renewal and extension of a double junction in Northumberland and Blackett Streets for the Tramways Committee of the Corporation. Alternative offers are asked for—(1st) in hardened cast steel points and crossings and rolled steel rails; (2nd) in manganese steel throughout. Plans may be seen, and specifications, schedule of quantities and form of tender obtained, at the office of the City Engineer, Town Hall, Newcastle-upon-Tyne, on payment of £1 1s. Tenders, endorsed "Tender for renewal, &c., of Northumberland Street junction," and addressed to the Chairman of Tramways Committee, to be delivered at the City Engineer's office, on or before September 11.

August 20. London, E.C.—*Supply and delivery of red and white lead*, as per specification to be seen at the company's offices, for the Bengal and North Western Railway Company. Tenders, addressed to A. Izat, 237, Gresham House, Old Broad Street, E.C., and marked "Tender for Red and White Lead," are to be lodged not later than noon on August 20. For each specification a fee of 10s. will be charged.

TOO LATE FOR CLASSIFICATION.

August 18. Dunfermline.—*Painting proposed to be done in connection with* the Dunfermline Combination Poorhouse. Copies of specification and particulars of the work may be obtained from the Governor. Sealed offers, marked outside "Painting Work," to be lodged with J. Delvin on or before August 18.

August 20. Knaresborough.—*Painter's work required at the Infirmary for Females* for the Board of Guardians. Specification of the work required to be done may be had on application to the Workhouse Master. Tenders to be sent to J. Smith, clerk, Poor Law Offices, Knaresborough, not later than August 20, endorsed "Tender for Painting."

August 25. Bangour.—*Painter work of four closed Homes* at Bangour Village Asylum. The relative schedules may be obtained on application to H. J. Blanc, R.S.A., architect, 25, Rutland Square, Edinburgh, where specification and general conditions of contract, &c., will be exhibited. The schedules shall be priced and extended, and lodged with J. Kyd, clerk and treasurer, District Lunacy Board Offices, Castle Terrace, Edinburgh, not later than August 25, at 10 a.m., along with the tender. In the event of the contractor deciding not to tender after receipt of the documents, these are required to be returned.

August 27. Hawthorn.—*Erection of a Mission Hall* at Hawthorn, Pontypridd, for the Trustees of the English Baptist Church. Plans and specification may be seen of A. LL. Thomas, A.M.I.M.E., architect and engineer, Church Street Chambers, Pontypridd. Tenders to be sent to the Rev. E. Lewis, 89 Wood Road, Pontypridd, by August 27.

August 27. Knotty Ash.—*Erection at Highfield Infirmary, Knotty Ash, of laundry buildings*, according to plans and specifications, to be seen at the office of E. Kirby and W. E. Willink, architects, 5, Cook Street, Liverpool, between the hours of 10 o'clock a.m. and 5 o'clock p.m. Bills of quantities, conditions of contract, and forms of tender (upon which alone offers will be received) may be obtained at 5, Cook Street, on payment of a deposit of £2. Sealed tenders must be delivered to H. J. Hagger, vestry clerk, Parish Offices, Brownlow Hill, not later than August 27.

August 28. Ashford.—*Supplying abont 640 superficial yards of Kentish ragstone paving* for the Maidstone Ashford Cattle Market. Plans and specifications may be seen at the offices of A. J. Burrows, F.S.I., surveyor, Bank Street, Ashford. Tenders to be sent to F. Hughes-Hallett, secretary, Ashford, not later than August 28.

August 28. Ashford.—*Supplying and erecting about 325 feet run tubular iron fencing with cast iron standards and supplying and laying about 220 feet 1¼in. galvanised water pipe with hydrant* for the Maidstone Ashford cattle market. Plans and specifications may be seen at the offices of A. J. Burrows, F.S.I., surveyor, Bank Street, Ashford. Tenders are to be sent to F. Hughes-Hallett, secretary, Ashford, not later than August 28.

August 28. Eastby, near Skipton.—*Erection of an entrance lodge* at the Sanatorium, Eastby, near Skipton. Contractors desirous of tendering for this work are requested to forward their applications not later than August 18, along with a deposit of £1 1s., to F. Holland, engineer and architect to the Board, 11, Parkinson's Chambers, Hustlergate, Bradford. Particulars will be forwarded in due course. Drawings and specifications may be seen at the architect's offices. Sealed tenders, on separate forms of tender supplied, to be endorsed "Eastby," to be sent to G. M. Crowther, clerk to the Guardians, 22, Manor Row, Bradford, not later than 10 a.m. on August 28.

August 31. Cadiz, Ohio.—*17,700 square yards more or less, of street paving with brick.* Sealed proposals will be received by the Clerk of the Village of Cadiz, Ohio, until 12 o'clock noon, August 31. Plans and specifications can be seen and forms of proposals obtained at the office of the Village Clerk, or the Engineers, The Riggs-Sherman Co., 613, Nasby Building, Toledo, Ohio.

Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, *Great New Street, Fetter Lane, E.C.*

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Basford (Notts).—For the construction of 3½ miles of 9-in. sewers and disposal works in the parish of Brinsley, for the Basford R.D.C. Mr. S. Maylan, engineer and surveyor:—

R. H. B. Neale, Plymouth	£5,109	0	0
Hewett & Sons, Barking	4,281	19	10
J. H. Macdonald, Oxford	4,273	0	0
W. H. Worthington, Manchester	4,267	19	2
T. H. Harper, Carlton	4,260	0	0
Cope & Raynor	4,222	15	0
Lock, Andrews & Price, Nottingham	4,139	0	0
Johnson & Langley, Leicester	4,107	14	6
A. J. Cottle, Rotherham	4,088	12	5
Bentley & Lock, Leicester	4,026	3	10
H. Bennett, Mansfield	3,950	4	10
Crane & Co., Nottingham	3,733	0	0
Lane Bros., Mansfield	3,700	7	5
Hooper, Neary & Co., Greenwich	3,698	0	0
Mackay & Son, Edinburgh	3,674	18	5
S. Loach, Carlton	3,558	5	0
H. H. Barry, Radcliffe-on-Trent	3,409	15	6
Thraves & Sons, Stapleford	3,373	0	0
Cox & Co., Mill House, Ilkeston	3,290	18	8
H. E. Buckley, Bradford	3,287	1	5
Harris Bros., Leeds	3,200	0	0
J. H. Wood,* Leeds	3,115	0	0

*Accepted.

Gloucester.—Accepted for heating and ventilation of new Council Schools, Derby Road, Gloucester, for the Gloucestershire Education Committee. Mr. E. J. Cullis, A.M.I.C.E., engineer.

Beaven & Sons, Ltd., Gloucester	£1,280

Hereford.—For the construction of a block of five cottages in Gwynne Street, Hereford, for Mrs. Lucy Dutton:—

Messrs. W. Bowers & Co.	£1,060	0	0
C. Cooke	1,045	0	0
E. W. Wilks	1,037	10	0
J. T. Jones	1,005	0	0
W. Powell	998	0	0
T. Hiles	994	10	0
R. Taylor.*	950	0	0

(All of Hereford.)
*Accepted.

London, E.C.—For the rebuilding of No. 33, Fish Street Hill, E.C. Messrs. McKilliam & Procter, architects, 83, St. Paul's Churchyard, London, E.C. Architects' estimate, £1,200. Quantities by the architects.

				Time. Months.
Messrs. J. Cannon	£1,418	17	6	7
,, H. J. Green & Co.	1,380	0	0	3½
,, Battley, Sons & Holness	1,336	0	0	4
,, T. Lapthorne & Co.	1,278	0	0	3½
,, J. Greenwood & Co.	1,229	0	0	4½
,, Braid, Pater & Co.	1,226	0	0	3
,, Peacock Brothers*	1,217	0	0	3
,, Courtney & Fairbairn	1,200	0	0	4

* The tender of Messrs. Peacock Brothers accepted on account of time.

London, S.E.—For the demolition of Bexley House, London Street, and erecting on the site a branch library, for the Greenwich Borough Council. Messrs. Willis & Anderson, architects, 4 and 5, Adam Street, Adelphi, W.C.:—

F. Webster & Son	£6,782	0	0
E Mills	6,622	0	0
F. & T. Thome	6,236	0	0
J. T. Shorter & Co.	6,200	0	0
H. L. Holloway	6,200	0	0
A. N. Coles	6,192	0	0
W. Lawrence & Son	6,144	0	0
F. & F. H. Higgs	5,987	6	0
E. Thomas & J. Edge	5,953	0	0
Patman & Fotheringham	5,943	0	0
H. Kent	5,930	0	0
T. G. Sharpington	5,928	0	0
G. Parker	5,879	0	0
W. Mills	5,640	0	0
Hooper, Neary & Co.	5,432	18	0
F. J. Gorham,* Point Hill, Greenwich	5,234	0	0

*Provisionally accepted.

London, W.—Accepted for the construction of an underground convenience adjoining Uxbridge Road and within Kensington Gardens, for the Paddington B.C. Mr. E. B. Newton, A.M.I.C.E., F.S.I., borough surveyor:—

Spencer, Santo & Co., Warwick Road, Kensington, W.	£2,527	0	0

Market Harborough.—For the construction of a Baptist Church. Geo. Baines & Son, architects, 5, Clements Inn, Strand, London, W.C.:—

Walter Lawrence & Son	£2,744	0	0
G. E. Wallis & Son	2,632	0	0
Linnell & Son	2,618	3	6
Battley, Sons & Holness	2,347	0	0
Clark & Garrett	2,340	0	0
Thos. Herbert	2,335	0	0
E. Brown & Son	2,330	0	0
A. P. Hawtin	2,270	0	0
Geo. Henson & Son	2,257	0	0
Thos. Hickman	2,237	10	0
Hy. Green	2,180	0	0
A. J. Chown	2,094	18	6
Hy. Herbert & Sons,* Millstone Lane, Leicester	2,050	0	0

*Accepted with modification.

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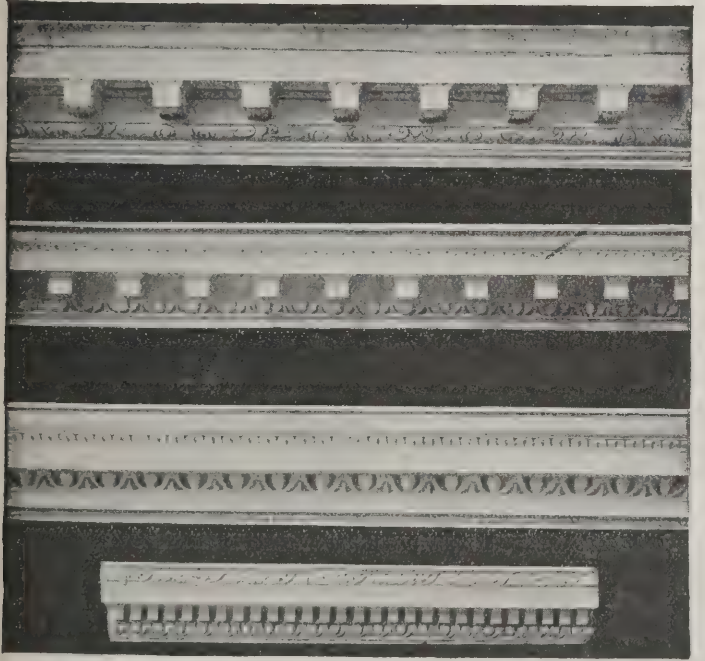

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MISCELLANEOUS.

		£ s. d.	£ s. d.
Castor Oil, French ...	per cwt.	1 10 0	1 2 0
Colza Oil, English ...	do.	1 7 0	—
Copperas	per ton	2 0 0	—
Lard Oil	per cwt.	2 15 0	2 17 0
Lead, white, ground, carbonate	per ton	16 0 0	—
Do. red	do.	15 0 0	19 0 0
Linseed Oil, barrels ...	per cwt.	1 0 4½	—
Petroleum, American ...	per gal.	0 0 6⅜	0 0 6½
Do. Russian ...	do.	0 0 5⅞	0 0 6
Pitch	per barrel	0 9 0	—
Shellac, orange	per cwt.	10 15 0	—
Soda, crystals	per ton	3 2 6	3 5 0
Tallow, Town	per cwt.	1 7 6	1 8 6
Tar, Stockholm	per barrel	1 5 0	—
Turpentine	per cwt.	2 5 0	—

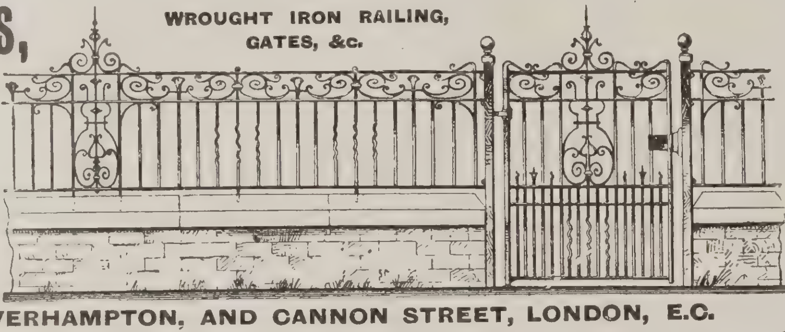
METALS.

		£ s. d.	£ s. d.
Standard Copper	per ton	83 0 0	84 0 0
Do. Strong sheets ...	do.	95 0 0	96 0 0
Lead, soft foreign	do.	16 15 0	17 0 0
Do. English	do.	17 0 0	17 10 0
Do. pipes...	do.	19 15 0	20 0 0
Do. sheets	do.	19 7 6	19 10 0
Galvanised Corrugated sheets	do.	12 10 0	12 15 0
Spelter G.M.	do.	26 15 0	27 0 0
Angles, Scotland	do.	7 0 0	7 2 6
Bars, do.	do.	7 17 6	8 0 0
Marked bars, Staffs. ...	do.	8 10 0	8 12 6
Common bars do. ...	do.	6 5 0	6 10 0
Angles, M'boro.	do.	6 10 0	6 15 0
Joists do.	do.	6 5 0	6 7 6
Angles, Midlands	do.	6 15 0	6 17 6
Joists, Midlands	do.	6 17 6	7 0 0
Girder plates, Midlands ...	do.	7 10 0	7 12 6
Angles, Foreign, c.i.f. Thames	do.	6 7 6	6 10 0
Tees do. do. do.	do.	6 10 0	6 12 6
Joists, Foreign, c.i.f. Thames	do.	6 2 6	6 5 0
Channels do. do. do.	do.	6 7 6	6 10 0
Plates do. do. do.	do.	6 15 0	7 0 0
Tin, Foreign	do.	179 0 0	180 0 0
Do. English ingots ...	do.	179 0 0	180 0 0
Zinc, sheets, Silesian ...	do.	30 10 0	31 0 0

TIMBER.

Soft Woods.

		£ s. d.	*£ s d.*
Deals, Archangel, Yellow, 2nd, 3×9	per std.	15 5 0	—
Do. do. do. 3rd, 3×9	do.	11 10 0	—
Do. Abo, Yellow and white 2½×7	do.	6 17 6	—
Do. Batskarsnas, Yellow, 2nd, 3×9	do.	10 5 0	—
Do. St. Petersburg, Yellow, 1st, 3×9	do.	10 10 0	—
Do. do. do. do. 2½×7	do.	10 10 0	10 15 0
Do. do. do. 2nd, 3×9	do.	9 15 0	—
Do. do. do. do. 2½×7	do.	9 10 0	—
Do. Umba, 2nd. 3×11	do.	16 10 0	—
Battens, Blankaholm, Yellow, 1st. 2×9	do.	10 15 0	—
Do. do. do. 2nd, 2½×6	do.	9 0 0	—
Do. do do. 1st and 2nd. 2×4	do.	10 0 0	—
Do. Batskararsnas, Yellow, 2nd, 2×9	do.	10 10 0	—
Do, Dornsjo, White, 2nd, 1¼×9	do.	10 10 0	10 15 0
Do. do. do. 3rd, 1½×9	do.	9 0 0	—
Do. do. do. do. 1×9	do.	9 5 0	—
Do, Norrkoping Yellow, unsorted, 2×7	do.	9 15 0	—
Do, Ornskjoldsvik, Yellow and White, 5th, 2½×6½	do.	6 15 0	—
Do. Sandarne, white (planed) 1st, 1×9	do.	11 5 0	—
Do. Skonvik, white, unsorted, 1×9	do.	10 15 0	—
Do. St. Petersburg, Yellow, 1st, 2×7	do.	9 15 0	—
Do. do. do. 2nd, 2×7	do.	9 15 0	—
Do. do. do. 3rd, 2×3	do.	9 10 0	—
Do. Umba, Yellow, 2nd, 1½×5	do.	12 0 0	—
Do. do. do. do. 1¼×8	do.	11 10 0	—
Do. do. do. do. 1¼×6	do.	11 15 0	—
Do, do. do. do. 1×8	do.	12 10 0	—
Do, do. do. do. 1×7	do.	11 15 0	—
Do. do. do. 3rd, 1½×7	do.	9 5 0	—
Do. do. do. do. 1¼×7	do.	8 15 0	—
Do. do. do. 4th, 1¼×11	do.	8 10 0	—
Flooring Boards, Domsjo, Yellow, 2nd, 1¼×6	do.	0 13 6	0 13 9
Dô. do. do. do. 1×5½	do.	0 10 6	—
Do. do. do. do. 1×5½	do.	0 11 0	—
Do. Fredriksstad, Yellow, unsorted, 1×7	do.	0 10 3	—
Do. do. do. do. 1×6½	do.	0 10 0	—
Do. do. do. do. 1×6	do.	0 10 0	—
Do. Skonvik, Yellow, 1st. 1¼×6	do.	0 14 3	—
Do. do. do. do. 1¼×5½	do.	0 13 3	—
Do. do. do. ex. 1st, 1¼×5½	do.	0 14 6	—
Do. do. do. 2nd, 1¼×6	do.	0 13 3	0 13 6



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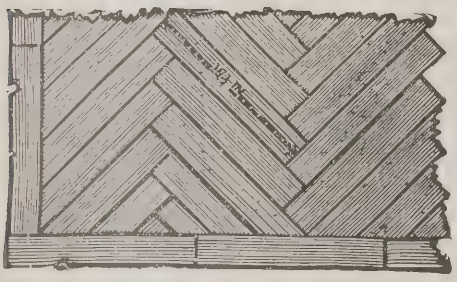

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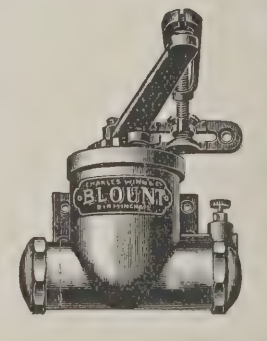

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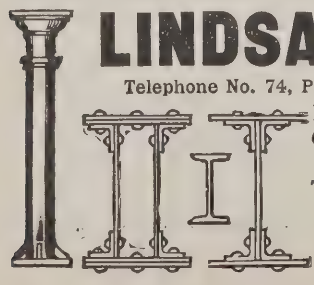

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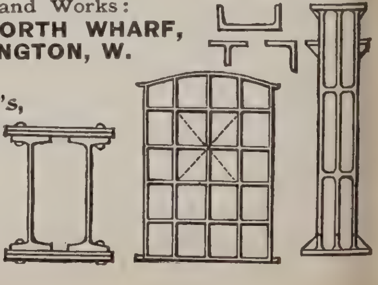


THE BUILDERS' JOURNAL
AND ARCHITECTURAL ENGINEER.

August 15, 1906.

CONCRETE AND STEEL SUPPLEMENT (MONTHLY).

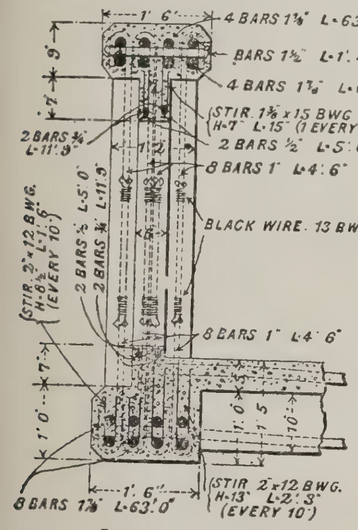
THE DESIGN OF REINFORCED CONCRETE BRIDGES.

By Charles F. Marsh, M.I.C.E., A.M.I.M.E.

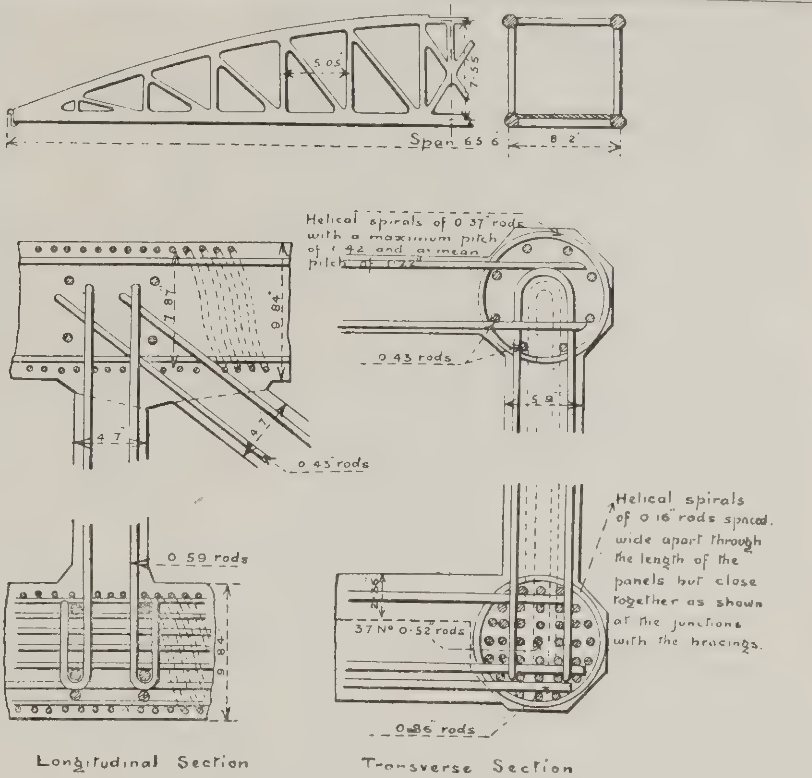
(Concluded from p. 33 No. 597).

For the Design of Bowstring Girders

of any considerable span, it would appear that the adoption of hooped concrete was almost a necessity, since the compression members can, by its employment, be reduced considerably in size. Fig. 5 shows the method of reinforcement adopted by M. Considère for a bridge of 65½ft. span, constructed for experimental purposes prior to the design of the Plougastel Bridge shown in Fig. 1.



Cross-Section of Truss.


5.05
7.55
Span 65 6
8 2
Helical spirals of 0.37" rods with a maximum pitch of 1.42 and a mean pitch of 1.22
1.87
9.84
0.43 rods
4.7
4.7
0.43 rods
5.9
0.59 rods
9.84
Helical spirals of 0.16" rods spaced wide apart through the length of the panels but close together as shown at the junctions with the bracings.
37 No 0.52 rods
0.86 rods

Longitudinal Section Transverse Section

FIG. 5.

The compression boom is of hooped concrete, while the tension members are reinforced in such a manner that the rods will take up the whole tensile stresses. The hooping shown in the tension boom is merely placed at the connections with the bracing to prevent any tendency to pulling the rods out of position. The connections of the rods in the bracing to the compression boom is secured by the adhesion of the metal and the concrete, but the strength is increased by forming each pair of

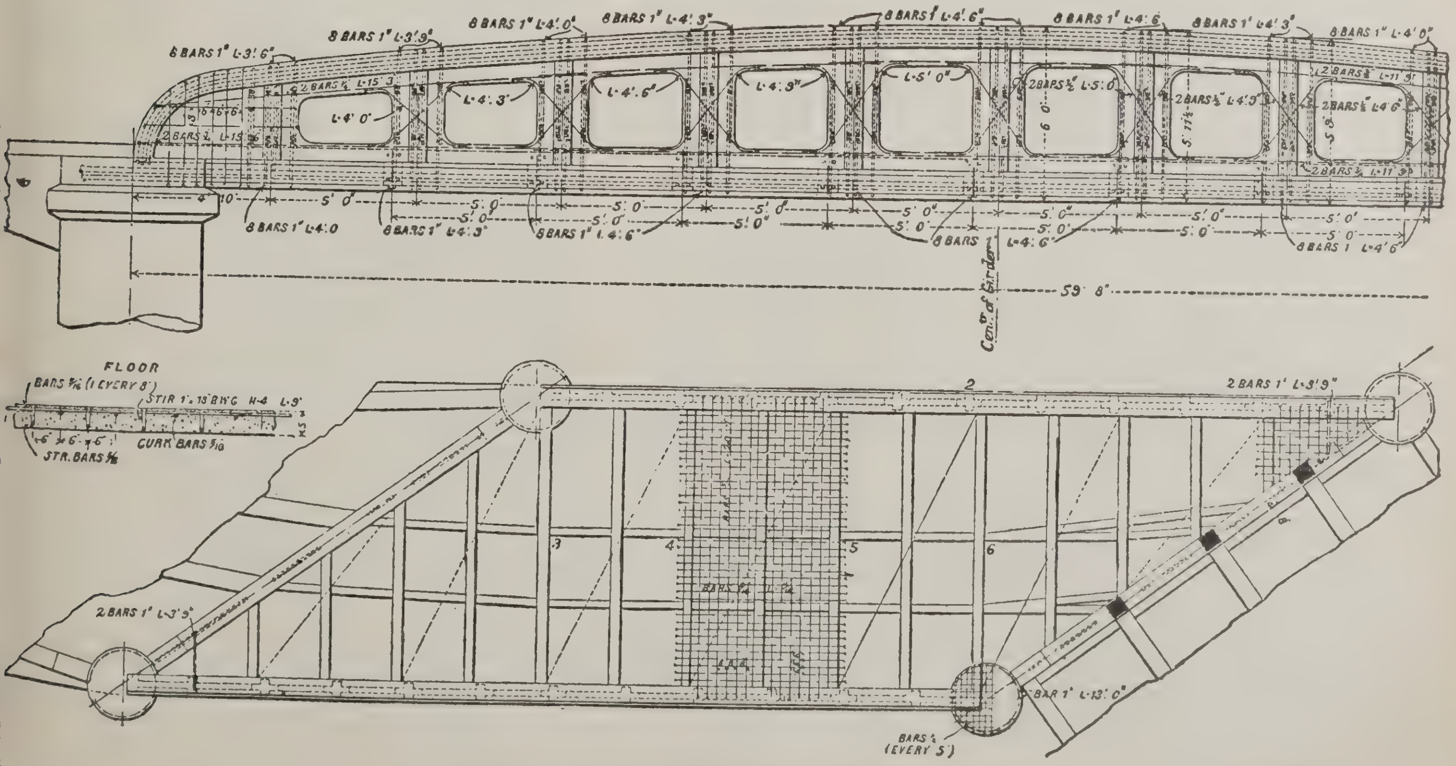


FIG. 6.

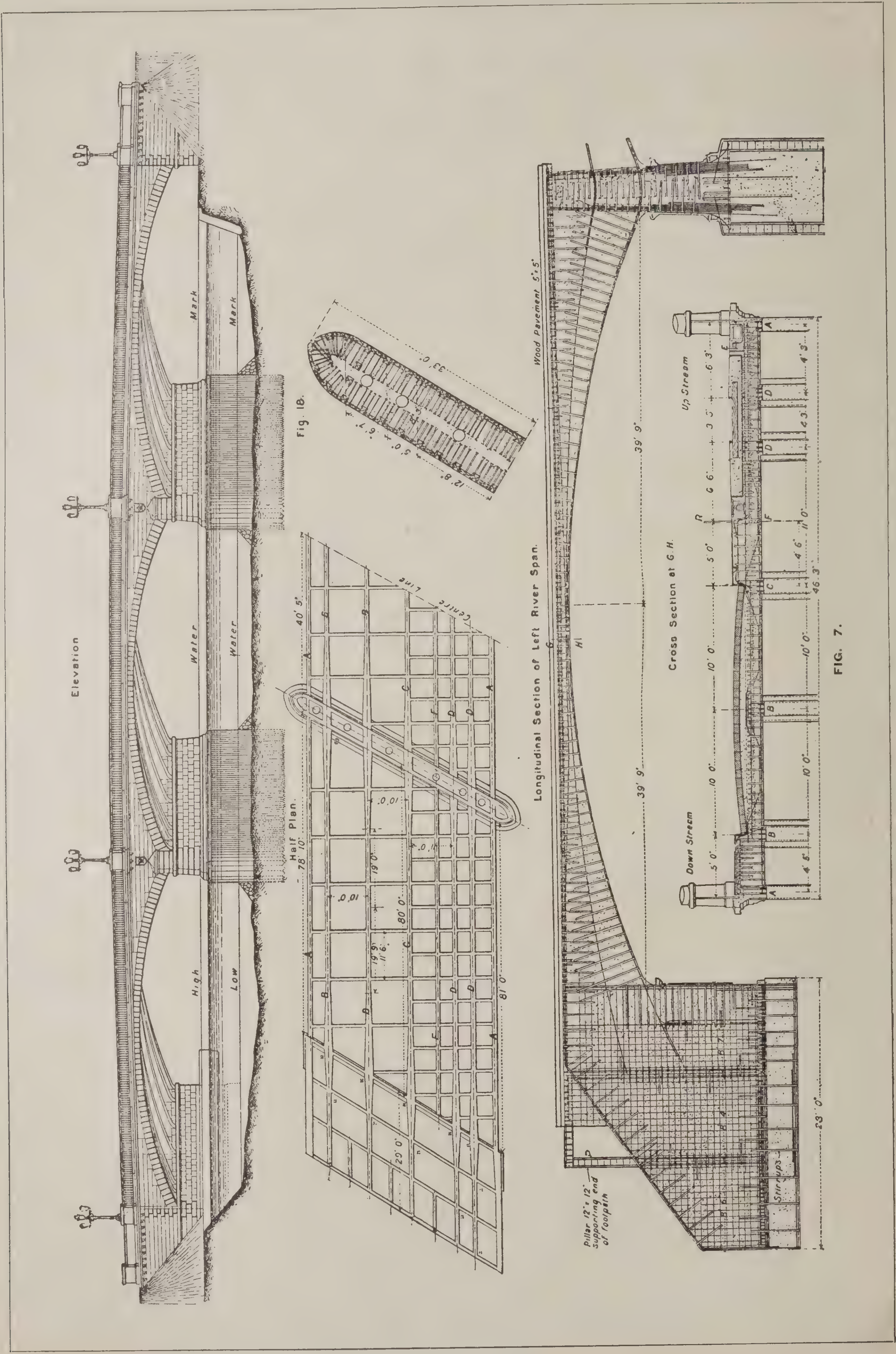
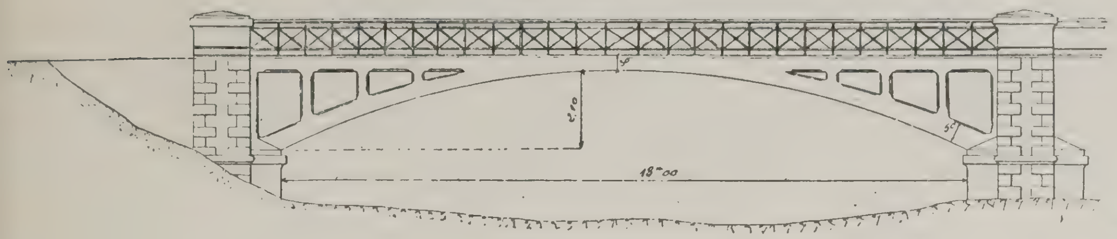
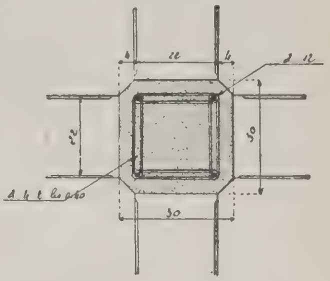

Elevation
High
Water
Mark
Low
Water
Mark
Fig. 18.
33' 0"
12' 8"
5' 0"
6' 7"
Half Plan.
78' 10"
40' 5"
81' 0"
80' 0"
19' 0"
10' 0"
20' 0"
Centre Line
A
B
C
D
E
Longitudinal Section of Left River Span.
Wood Pavement 5' 5"
39' 9"
39' 9"
G
H
Cross Section at G.H.
Up Stream
Down Stream
6' 3"
6' 6"
5' 0"
10' 0"
10' 0"
5' 0"
4' 3"
4' 3"
11' 0"
4' 6"
46' 3"
10' 0"
10' 0"
4' 6"
Pillar 12"x 12" supporting end of footpath
Stirrups
23' 0"

FIG. 7.

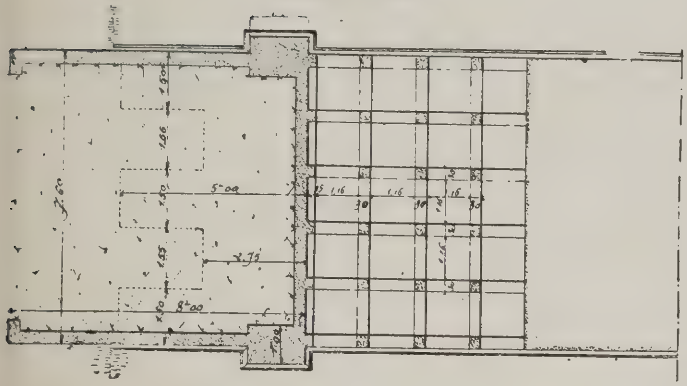
ELEVATION.



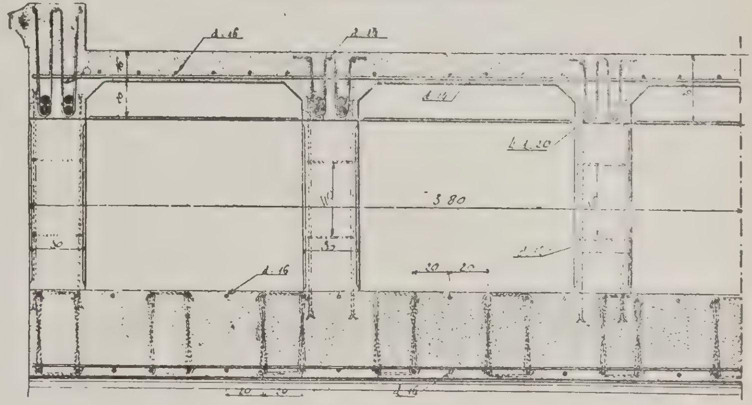
SECTION OF COLUMNS.



HALF PLAN.



HALF TRANSVERSE SECTION.



reinforcements in one piece with a loop at the top. No allowance is made for the adhesion in the tension boom.

Bowstring girder bridges have also been designed of ordinary reinforced concrete, of which Fig. 6 is an example. The tension and compression booms of this bridge are reinforced with straight rods, round which are bent the vertical rods of the bracing. Short horizontal rods are placed between the longitudinal in the top boom, and the rods from the cross beams supporting the decking are continued between the longitudinal rods in the bottom boom to offer further hold to the bracing rods.

The bracing only consists of cross shaped verticals, but additional reinforcing rods are placed in the upper portion of the bottom boom and lower portion of the upper boom, and four of these are bent so as to form inclined bracings passing through the vertical posts.

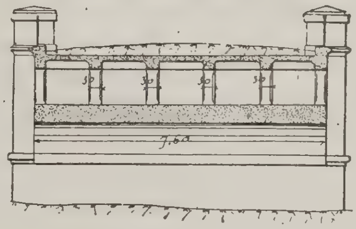
The decking is supported on cross beams from the lower boom, and rail bearing beams are inserted to carry a line of railway over the bridge.

The Design of Arch Bridges

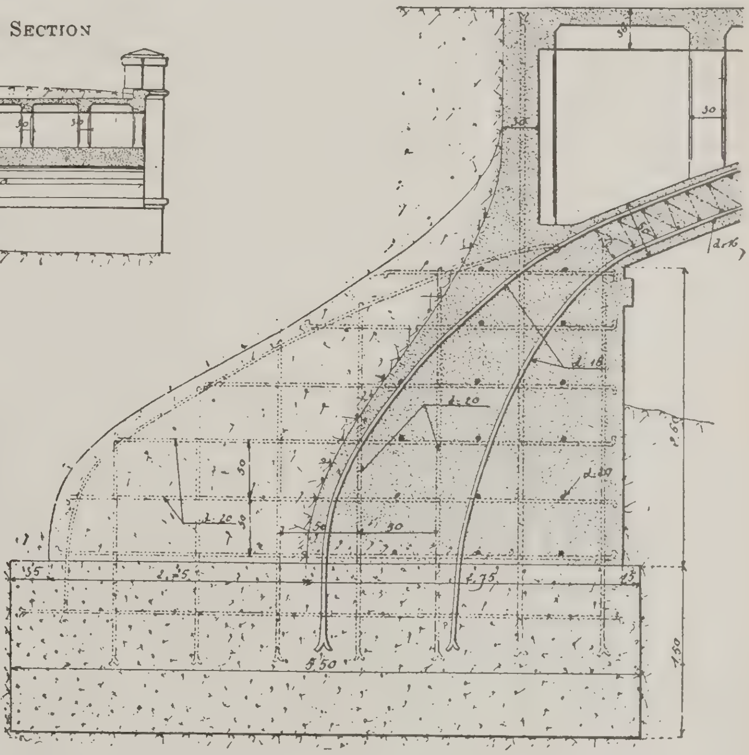
resolves itself practically into three main classes:—(1) Those formed with several ribs supporting the decking, either directly or with the aid of cross beams; (2) those formed as single arches without ribs and reinforced with bars of small sectional area; (3) those formed as single arches without ribs and reinforced with large sections.

All three classes may be designed with open spandrils of the arcade or colonnade type, but when this type is adopted, care should be taken to provide reinforcements to resist the shearing stresses at the junction of the spandril walls or columns with the arch. The third class perhaps lends itself most completely to the adoption of hinges, since they may be readily attached to the reinforcing sections. When the second class is erected with hinges they are usually formed by splaying back the concrete of the arch or specially worked stones inserted at the hinged joints and the insertion of lead fillets.

TRANSVERSE SECTION



DETAIL OF ABUTMENT.



The Continuous Arch

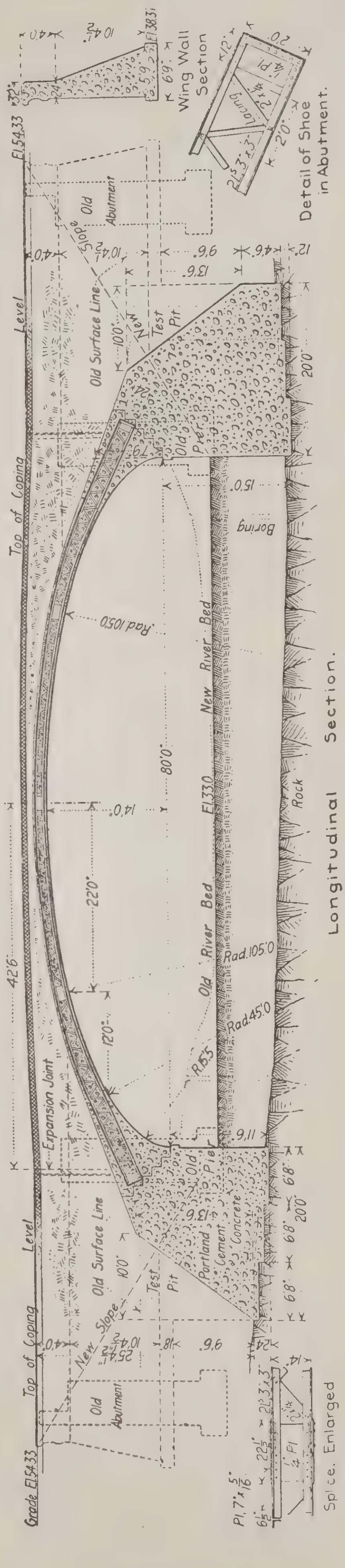
is the form most frequently adopted and, since the temperature stresses can be found when the arch is treated as being elastic, the employment of hinges is not so important for bridges of moderate span.

The first class is that most usually adopted by M. Hennebique for arches reinforced on his system. Fig. 7 shows a bridge of this class designed with seven ribs. One side of this bridge carried a road and the other a railway, consequently two ribs D were placed under the rails, while only one rib B was placed under the roadway. The outer B rib and rib C are under the sides of the roadway and the stringer beam F is placed under the outer edge of the central footway.

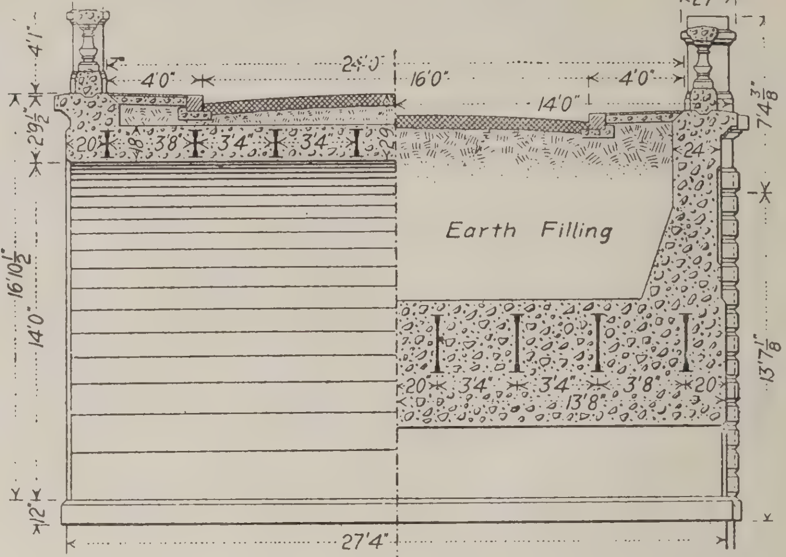
All the ribs, except those at the faces, are widened out towards the abutments, and are reinforced with three sets of rods, one following the intrados, one following the extrados at the springings and being bent down to follow the intrados at the crown; the remaining series occupy a mean position between the two others in the depth of the arch ring.

All the reinforcements are securely tied to the concrete by stirrups.

The decking is supported on cross beams reinforced with straight and bent-up rods, the decking itself being reinforced by horizontal rods in both directions. The piers are designed with reinforced face walls with the reinforcements securely tied into the filling of weaker concrete with stirrups.



Longitudinal Section.
FIG. 9 (Portion).



Half Section at Crown. | Half Section near Abutment

FIG. 9 (Portion).

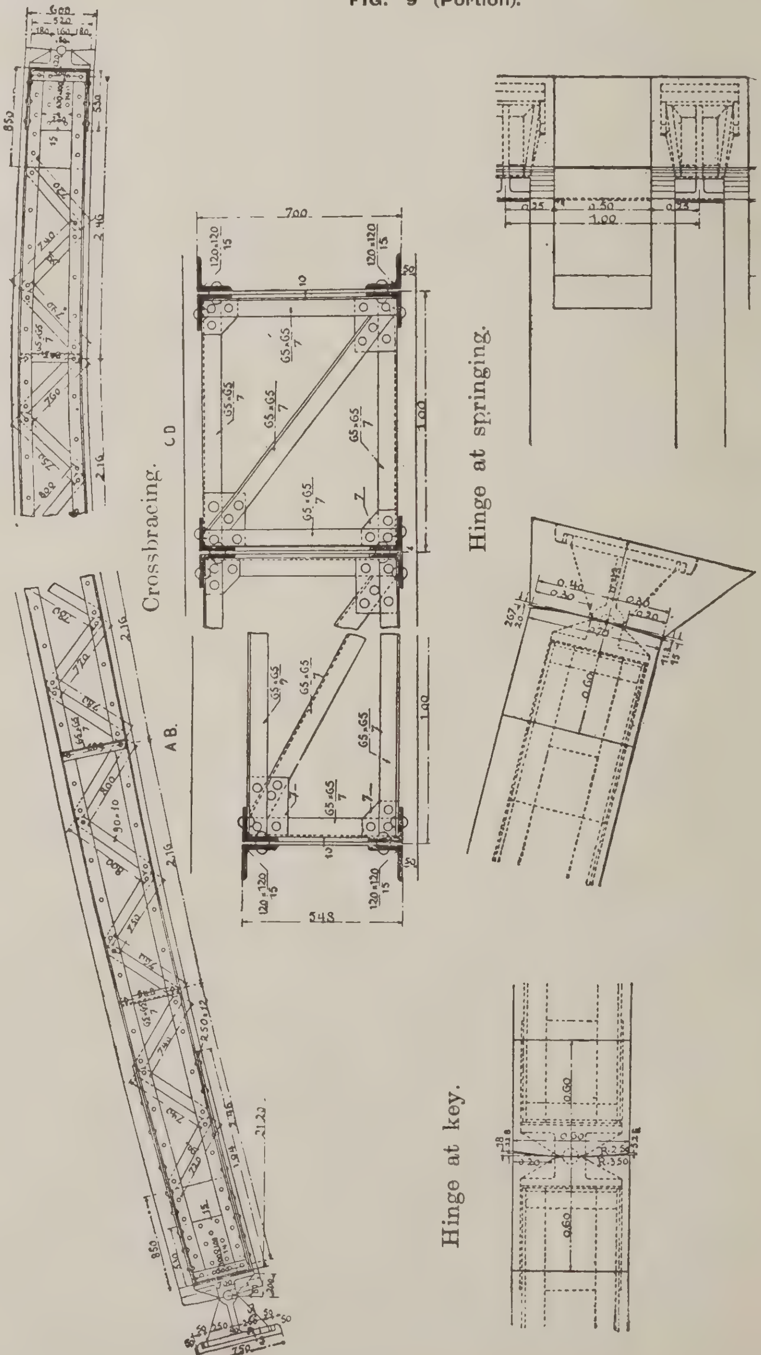


FIG. 10.

The abutments are formed with reinforced compartments, the ribs being continued right through, and additional division walls being inserted in the rear compartments. The arched ribs of this class of bridge are usually formed with a flat extrados, as shown in this illustration, but the extrados may be curved if thought desirable.

The second class of arched bridge is that most frequently adopted, and is the design employed by M. Monier for the first arches constructed of this material. Fig. 8 shows a bridge of this class with colonnade spandrils. The arch is reinforced with longitudinal rods near the intrados and extrados, and there is a further series of transverse rods near the intrados, the longitudinal rods near the extrados and intrados are securely tied together with wire ties. The longitudinal reinforcements are carried down to the foot of the abutments which are formed with counterforts.

The abutments are reinforced with vertical, longitudinal, and transverse rods, and the counterforts have vertical and transverse reinforcements.

The columns forming the spandrils are reinforced with four vertical rods, one at each corner, which are carried down well into the arch and tied together with wire ties. It would have improved the design if these rods had been bent out in the arch to resist shear.

The decking is supported by longitudinal and cross beams carried by the columns and reinforced along the bottom with four rods, which are tied to the concrete in the upper surface of the decking by wire stirrups, which are passed over small longitudinal rods at their upper ends. The decking is reinforced with longitudinal and transverse rods.

The third class, where heavy reinforcing sections are employed, is that adopted for the Melan and other similar systems.

Fig. 9 shows a bridge of this class.

The reinforcement consists of a series of built-up lattice girders, increasing in depth from the centre to the springings. The roadway is carried directly by the arch, and the abutments are formed solid without reinforcement. Fig. 10 gives the details of the reinforcements adopted for a three-hinged arch of this class, and indicates the adaptability of this type of reinforcement for hinged arches.

Although the Shearing Stresses are small in arched bridges, except locally, where open spandrils are employed, the longitudinal reinforcements should be well tied together, since the stresses are mainly compressive and the tying together of the reinforcements tends to prevent the swelling of the concrete.

It is well to provide expansion joints in continuous spandril walls of reinforced concrete arches, since the elastic deformation of the arch is liable to induce considerable stresses in the spandril walls, and may cause cracks if not provided for.

A Reinforced Concrete "Skyscraper."—The newest type of "skyscraper" is the concrete office building of eleven storeys near Herald Square, New York. The building will be erected in sections of two storeys each, with one-storey sections in certain places, so that each succeeding floor will fit into the one below. It is hoped to save from fourpence to fivepence a cubic foot as compared with steel-frame construction. The cost of the projected concrete "skyscraper" is estimated at about £400,000. The site is 126ft. by 99ft.

SHEAR STRESSES

In Beams of Steel and of Reinforced Concrete.

By Prof. Robert H. Smith,
A.M.I.C.E., M.I.M.E., M.I.E.E., &c.

(Concluded from p. 42, No. 597.)

The results of such calculations are very interesting, and are best appreciated when set out in diagram form. Fig. 3 gives the stress diagram for the reinforced concrete beam section taken above as illustration. The shear stresses are plotted to a scale five times more open than that used for the compressive and tensive stresses. The actual ratio between these two sets of stresses depends upon the ratio of the total shear force on the section to the bending moment to which it is subjected. In the compression-tension diagram the full line gives the normal stress upon the vertical section at each level, and it will be noted how it runs suddenly outwards in the steel part of the section. The dotted lines give the maximum tension and compression on oblique sections at each level, and it is useful to observe that these do not vary so rapidly as do the ordinarily calculated stresses on the vertical section. In fact, while from neutral axis to top surface the ordinary calculated compressive stress varies from uniformly to a maximum, the maximum compressive stress on oblique sections is at neutral axis still 80 per cent. of the value at the top, while there is also at neutral axis a maximum tension of the same amount. The maximum compressive stress really remains almost exactly constant throughout 40 per cent. of the total sectional depth. In the concrete just above this steel this maximum compression is still 50 per cent. of that at the top, while the maximum tension has an intensity of 90 per cent. of the top compression. Below this level the maximum compression is practically zero, and the maximum tension practically the same as that upon the vertical section.

Explanation of the Diagram.

In the shear stress diagram the lower full-line curve gives the shear stress on vertical and horizontal sections at each level, this being what is ordinarily calculated. The parabolic curve runs from zero at top to a maximum at neutral axis, and then decreases symmetrically from this axis to close upon the steel. Here it drops very rapidly through the depth of the steel, and finally runs to zero at the lower edge of the concrete.

The outer curve gives the maximum shears on oblique sections, the diagonally raffined area showing the excess of these over those on horizontal and vertical sections. This excess is zero at neutral axis, but at the top surface, where it is too often imagined that there is no shear, it is $\frac{5}{8}$ths of the value at the neutral axis, and the maximum shear remains almost constant at this through about 15 per cent. of the total sectional depth. Below the neutral axis it decreases symmetrically to just above the embedded steel. Here the maximum shear in the steel rises to rather more than five times the shear in the concrete immediately above it, and the maximum shear in the concrete below the steel is quite small, finishing at the bottom surface at a value, in this case, or half its value at the top surface.

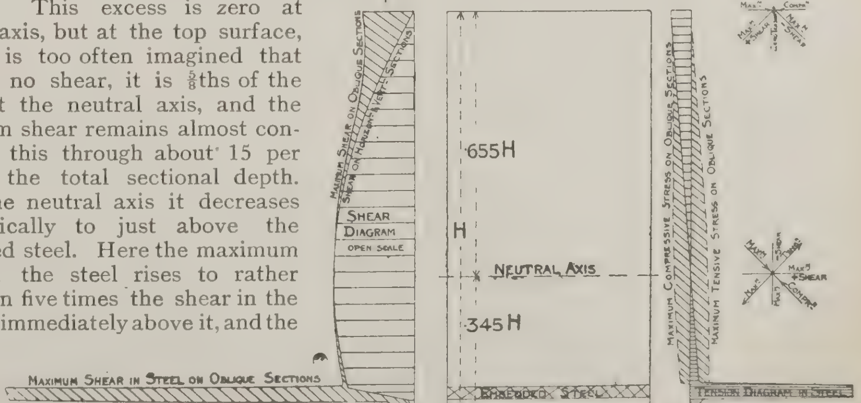
It is hardly needful to point out that these maximum compressive, tensive and shear stresses are those on which the safety of the beam against breakage really depends. It follows that the material of a "full" rectangular section is a great deal more completely utilised than one would be led to suppose by consideration only of those stresses ordinarily calculated, namely, those on the vertical and horizontal sections.

Shear Stresses in Steel Beams.

The compressive and tensive strengths of steel are about equal. In rolled steel with ·1 per cent. carbon they vary from 50,000 to 60,000lbs. per sq. in., and with ·15 per cent. carbon from 60,000 to 70,000, while in steel castings they may be taken as varying from 60,000 to 90,000. The shear strength is somewhat less, and in a rather uncertain ratio. In these three materials it may be considered to average from 45,000 to 50,000, from 50,000 to 60,000, and from 50,000 to 70,000. The material is practically homogeneous in respect of its stress and strain qualities, although rolled mild steel bar has certainly some excess of tenacity in direction of rolling.

The stresses will be most readily understood from the calculation of one or two examples. We take two I beams of the same proportions except that one has a web of double the thickness of the other. We are chiefly interested in proportions and not in absolute sizes, and we therefore call the depth of section 100. The linear unit may be any, such as a millimetre, $\frac{1}{8}$th or $\frac{1}{10}$th or $\frac{1}{4}$ inch. It may be convenient to think of the sizes in $\frac{1}{10}$th inches. The numerical calculations are set out for a flange breadth of 60, and flange-edge thickness 10, tapering to 15 at the web. Immediately following the numerical calculations, they will be found repeated in general algebraic terms. The disadvantage of these latter is that to the eye they appear fearsomely complicated and difficult; but reference to their numerical analogues will show that this apparent excessive difficulty disappears so soon as special values are given to the letter symbols.

The ease and rapidity of such calculations depends very greatly upon the orderly method followed in carrying them out. The best method is to look on the section as made up of (1) a full rectangle of outside dimensions; (2) a negative rectangle of web-depth and of width equal to flange, minus web-width; and (3) four negative triangular areas under the bevels of the tapered flanges.



Maximum Shear on Oblique Sections
Shear on Horizon! & Vert! Sections
Shear Diagram
Open Scale
Maximum Shear in Steel on Oblique Sections
·655H
H
Neutral Axis
·345H
Embedded Steel
Maximum Compressive Stress on Oblique Sections
Maximum Tensive Stress on Oblique Sections
Tension Diagram in Steel
Max.m
Comp.n
Max.m +Shear
Max.m -Shear
Zero Tens.
Max.m -Shear
Max.m Tens.
Max.m +Shear
Max.m
Comp.n
Max.m

FIG. 3.

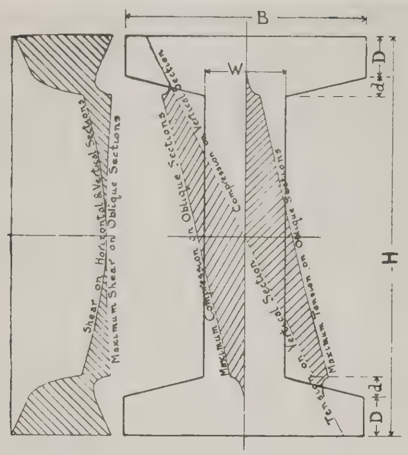

B
W
D
d
H
d
D
Shear on Horizontal & Vertical Sections
Maximum Shear on Oblique Sections
Oblique Sections
Vertical Section
Compression on
Maximum Compression on Oblique Sections
Vertical Section
Tension on Oblique Sections
Maximum Tension on

FIG. 4.

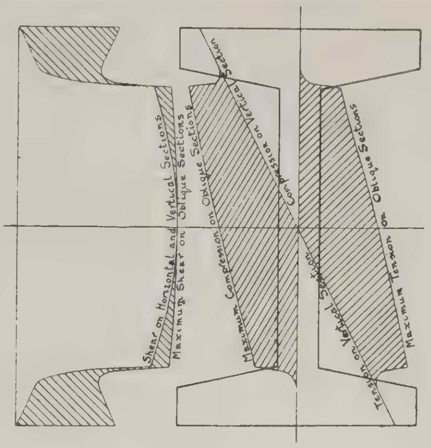

Shear on Horizontal and Vertical Sections
Maximum Shear on Oblique Sections
Maximum Compression on Oblique Sections
Compression on Vertical Section
Tension on Vertical Section
Maximum Tension on Oblique Sections

FIG. 5.

Referring first to Fig. 4 with web-thickness 20_e, and web-depth 70, the Sectional Area$=$A$= (60\times 100-40\times 70-4\times 5\times 10)u^2$
$=(6{,}000-2{,}800-200)u^2= 3{,}000u^2$,
where u is the linear unit in which sizes are measured. Of this the web-area is $20\times 70u^2=1{,}400u^2$.

The Moment of Inertia is

$$\mathrm{I}=\frac{u^4}{12}(60\times 100^3-40\times 70^3)-$$

$$4u^4\times 5\times 10\left\{\frac{5^2}{18}+\left(\frac{110}{3}\right)^2\right\}$$

$$=10^4u^4\left\{\frac{6{,}000-1{,}372}{12}+\frac{242{\cdot}25}{9}\right\}=$$

$10^4(385{\cdot}67-26{\cdot}92)\,u^4=10^4\times 358{\cdot}75u^4$. Of this the web contributes

$$\frac{u^4}{12}\times 20\times 70^3=10^4\times 57{\cdot}17u^4.$$

If $\mathrm{T_m}$ be the extreme fibre longitudinal tension and compression, the Bending Moment is

$$\mathrm{M}=\frac{\mathrm{I}}{50}\mathrm{T_m}=71{,}750u^3\mathrm{T_m}.$$

Therefore, if $\mathrm{T'_m}$ be the rate at which $\mathrm{T_m}$ varies longitudinally, and the section being taken as constant, the total shear form on the section is

$$\mathrm{F}=\mathrm{M}'=71{,}750u^3\mathrm{T'_m}$$

and the *average* shear stress over the whole section is

$$\mathrm{F/A}=\frac{71{,}750}{3{,}000}u\mathrm{T'_m}=23{\cdot}92u\mathrm{T'_m}.$$

Making now similar calculations for the section in Fig. 2, with web thickness 10, there is found,

$$\mathrm{A}=(6{,}000-3{,}500-250)\,u^2=2250\,u^2,$$

of which the web contributes $10\times 70u^2=700u^2$.

$$1=\frac{u^4}{12}\left(60\times 100^3-50\times 70^3\right)-$$

$$250\left\{\frac{5^2}{18}+\left(\frac{110}{3}\right)^2\right\}u^4$$

$$=10^4\,u^4\left\{\frac{6{,}000-1{,}715}{12}-\frac{302{\cdot}81}{9}\right\}=$$

$$10^4\times 323{\cdot}43u^4,$$

of which the web contributes $10^4\times 28{\cdot}58u^4$.

$$\mathrm{M}=\frac{\mathrm{I}}{50}\,\mathrm{T_m}=64{,}686u^3\mathrm{T_m},$$

$$\text{and }\mathrm{F/A}=\frac{64{,}686}{2{,}250}u\mathrm{T'_m}=28{\cdot}75u\mathrm{T'_m}.$$

If now the total sectional depth be called, for any sectional proportions, H, the flange width B, the web thickness W, the flange edge-thickness D and the flange thickness at web $(\mathrm{D}+d)$, then

$$\mathrm{A}=\mathrm{BH}-(\mathrm{B}-\mathrm{W})\ (\mathrm{H}-2\mathrm{D}-d)$$

$$\mathrm{I}=\tfrac{1}{12}\left\{\mathrm{BH}^3-(\mathrm{B}-\mathrm{W})\ (\mathrm{H}-2\mathrm{D}-2d)^3\right\}-$$

$$(\mathrm{B}-\mathrm{W})\,d\left\{\frac{d^2}{18}+\left(\frac{\mathrm{H}}{2}-\mathrm{D}-\frac{2d}{3}\right)^2\right\}.$$

This expression for I may be simplified algebraically, but the above numerical examples show that the form here given is really the simplest for calculation.

In the arithmetic calculation of I the factor $\left\{\frac{d^2}{18}+\left(\frac{\mathrm{H}}{2}-\mathrm{D}-\frac{2d}{3}\right)^2\right\}$ is conveniently taken in the form $\frac{1}{9}\left\{\frac{d^2}{2}+\left(1\tfrac{1}{2}\,\mathrm{H}-3\mathrm{D}-2d\right)^2\right\}$, and it will always be found that the term $\frac{d^2}{2}$ is negligibly small. It corresponds to the I of the small triangular areas about an axis through their own centres of area. In the above examples it is only about $\frac{1}{10000}$th of the whole, and, therefore, affects only the 5th significant figure in the result.

Then

$$\mathrm{M}=\frac{2\mathrm{I}}{\mathrm{H}}\ \mathrm{T_m}\text{ and }\mathrm{F/A}=\frac{2\mathrm{I}}{\mathrm{HA}}\ \mathrm{T'_m}$$

With regard to the value of F, if the beam be symmetrically supported at its two ends and have its load symmetrically distributed, the greatest F occurs close to either end and equals half the total load. It changes sign at the centre. With a single concentrated load it remains uniform throughout each half of the span, and with a uniformly distributed load decreases uniformly from the above maximum at either end to zero at the centre. It is always quite easy to find for every section throughout the span from the special mode of loading. Therefore the last equation is really useful inversely for calculating $\mathrm{T'_m}$ from F rather than for finding F/A from t'. This inverse form of it is

$$\mathrm{T'_m}=\frac{\mathrm{H}}{2\mathrm{I}}\ \mathrm{F}=\begin{cases}\dfrac{\mathrm{F}}{71{,}750u^3}\text{ in Fig 4.}\\[2ex]\dfrac{\mathrm{F}}{64{,}686u^3}\text{ in Fig 5.}\end{cases}$$

Although the average shear on vertical sections is easy to calculate, this is little guide to the maximum shear, which is the stress of real practical importance. At each level the shear depends on the total of the normal stress above or below that level, and, therefore, we must now calculate the distribution of this normal stress.

The normal stress at top or bottom surface being called $\mathrm{T_m}$, and varying uniformly from this to zero at neutral axis at mid-depth of the section, if this section were a full rectangular one the total normal force above or below neutral axis would be $60\times 50\times\frac{\mathrm{T_m}}{2}=\frac{\mathrm{BH\,T_m}}{4}$, and that on the part of the section of height h above neutral axis would be $60\times h\times\frac{h}{50}\,\frac{\mathrm{T_m}}{2}=\frac{\mathrm{B}}{}\,h^2\mathrm{T_m}$. The sectional breadth, however, being variable, allowance has to be made for this, remembering that, for each rectangular part, its contribution would be proportional to h^2 if it stretched down to the neutral axis.

Thus for both sections in Figs. 4 and 5 the normal force on the parallel part of one flange is

$$\frac{60}{2}\left(50-\frac{40^2}{50}\right)\mathrm{T_m}={\cdot}6(50^2-40^2)\mathrm{T_m}=540\mathrm{T_m}.$$

In general terms this is

$$\frac{\mathrm{B}}{2}\left\{\frac{\mathrm{H}}{2}-\frac{2}{\mathrm{H}}\left(\frac{\mathrm{H}}{2}-\mathrm{D}^2\right)\right\}\mathrm{T_m}=\mathrm{BD}\left(1-\frac{\mathrm{D}}{\mathrm{H}}\right)\mathrm{T_m}.$$

The amount on the half of the web on either side of the neutral axis is in Fig. 4

$$\frac{20}{2}\cdot\frac{35^2}{50}\mathrm{T_m}=\frac{1}{5}\times 35^2\mathrm{T_m}=245\mathrm{T_m}.$$

and in Fig. 5

$$\frac{10}{2}\cdot\frac{35^2}{50}\mathrm{T_m}=\frac{1}{10}\times 35^2\mathrm{T_m}=122{\cdot}5\mathrm{T_m},$$

the general formula being

$$\frac{\mathrm{W}}{2}\cdot\frac{2}{\mathrm{H}}\left(\frac{\mathrm{H}}{2}-\mathrm{D}-d\right)^2\mathrm{T_m}=\frac{\mathrm{W}}{\mathrm{H}}\left(\frac{\mathrm{H}}{2}-\mathrm{D}-d\right)^2\mathrm{T_m}.$$

On the tapered part of the flange, the

Total Normal Forces and Shear Stresses on Vertical and Horizontal Sections, Fig. 4.

—	Distance from N. Axis h	$\cdot 2\,h^2$	Total Force above h	Breadth of Section	Total Force above h ÷Breadth
			$936{\cdot}67-{\cdot}2\,h^2$		
Web	0 10 20 30 35	0 20 180 180 245	936·67 916·67 856·67 756·67 691·67	20 ,, ,, ,, ,,	46·83 45·83 42·83 37·83 34·59
		From 35 to level h $\cdot 08\left[\frac{2}{3}h^3-\frac{65}{2}h^2\right]_{35}^{h}$	$691{\cdot}67-{\cdot}08\left[\ \right]_{35}^{h}$	—	—
Tapered part of Flange	35 36 37 38 39 40	0 17·05 40·43 70·44 107·41 151·67	691·67 674·62 651·24 621·23 584·26 540·00	20 28 36 44 52 60	34·59 24·08 18·10 14·12 11·23 9·00
		—	$\cdot 6(50^2-h^2)$	—	—
Parallel part of Flange	40 42 45 48 49 50	— — — — — —	540·0 441·6 285·0 117·6 59·4 0	60 ,, ,, ,, ,, ,,	9·00 7·36 4·75 1·96 ·99 0

Total Normal Forces and Shear Stresses on Vertical and Horizontal Sections, Fig. 2.

—	Distance from N. Axis h	$\cdot1\ h^2$	Total Force above H $795\cdot8-\cdot1\ h^2$	Breadth of Section	Total Force above h ÷ Breadth
Web	0	0	795·8	10	79·58
	10	10	785·8	,,	78·58
	20	40	755·8	,,	75·58
	30	90	705·8	,,	70 58
	35	122·5	673·3	,,	67·33
		$\cdot2\left[\frac{h^3}{3}-17h^2\right]^{h}_{35}$	$673\cdot3-\cdot2\left[\ \right]^{h}_{35}$	—	—
Tapered Part of Flange	35	0	673·33	10	67·33
	36	10.67	662·67	20	33·13
	37	28·93	644·40	30	21·48
	38	55·20	618·13	40	15·45
	39	89·87	583·46	50	11·67
	40	133·33	540·00	60	9·00
		—	$\cdot6\left(50^2-h^2\right)$	—	—
Parallel Part of Flange	40	—	540·0	60	9·00
	42	—	441·6	,,	7·36
	45	—	285·0	,,	4·75
	48	—	117·6	,,	1·96
	49	—	59·4	,,	·99
	50	—	0	,,	0

normal force is

$$\int_{35}^{40}\left(20+40\cdot\frac{h-35}{5}\right)\frac{h}{50}T_m\cdot dh=\frac{8}{100}T_m$$

$$\int_{35}^{40}(2h-65)\,h.dh=\frac{8}{100}T_m\left[\frac{2}{3}h^3-\frac{65}{2}h^2\right]_{35}^{40}$$

$$=151\frac{2}{3}T_m$$

in Fig. 4; and in Fig. 5

$$\int_{35}^{40}\left(10+50\frac{h-35}{5}\right)\frac{h}{50}T_m.dh=\frac{5}{T_m}\int_{35}^{40}$$

$$(h-34)\,h.dh=\frac{T_m}{5}\left[\frac{h^3}{3}-17h^2\right]_{35}^{40}=133\tfrac{1}{3}T_m.$$

Here the first quantity inside brackets within the sign of integration is the width of the flange at each level *h*.

Summing these three parts, we find the total normal force on each half of the section above or below neutral axis to be—

in Fig. 4.		in Fig. 5.
540 T_m.	Parallel part of flange	540 T_m.
$151\frac{2}{3}$,,	Tapered ,, ,,	$133\frac{1}{3}$,,
245 ,,	Web - - -	$122\frac{1}{2}$,,
$936\frac{2}{3}T_m$.	Total - - -	$795\frac{5}{6}T_m$.

Using these results there is next obtained, by exactly the same methods as those just illustrated, the accompanying tables of total normal force on the vertical section above or below a series of levels distant *h* from neutral axis. In actual design it is, of course, unnecessary to calculate this for so many different levels as here given. The object here is to show the mode of variation of shear stress over the section and to do this by means of diagrams on which the true nature of the curve is correctly demonstrated. Moreover, it is particularly desired to explain the dangerous stress phenomena that arise where sudden change of dimensions occur, and thus to prove the great undesirability of a sudden change of sectional width from full flange breadth to web thickness—that is, the omission of taper on the flange thickness. Therefore, in the following tables, calculations are made for five levels throughout the tapered depth of the flange. It is here, of course, that the shear curve takes a very steep slope and dangerous character.

The 4th column of these tables is to be multiplied by $T_m\ u^2$ to give the Total Normal Force on the vertical section above or below level *h*. If for $T_m\ u^2$ there be substituted $T'_m\ u^3$, the product will give the corresponding *difference* of normal force on two sections at unit (u) distance apart; and if this be divided by u × breadth of section at level *h*, the quotient gives the shear stress at this level on horizontal and vertical sections. Thus the numbers in the last column multiplied by $T'_m\,u$ give this shear stress. Now, $T'_m\ u=u.\ \frac{H}{2I}.\ F$

$$=\begin{cases}\dfrac{F}{71{,}750u^2}\ \text{in Fig. 4}\\[2ex]\dfrac{F}{64{,}686u^2}\ \text{in Fig. 5}\end{cases}$$

In terms of F, the total shear load at each section of the beam, these last are the factors to apply to the numbers in the last column in order to obtain the shear stress at each level *h* in the section. Now, the *average* shear stress over the whole section is

$$\frac{F}{A}=\begin{cases}\dfrac{F}{3{,}000u^2}\ \text{in Fig. 4.}\\[2ex]\dfrac{F}{2{,}250u^2}\ \text{in Fig. 5.}\end{cases}$$

Thus, in order to find the ratio of the actual shear at any level *h* to the average shear, we have to multiply the tabular numbers in the last column by

$$\frac{F}{71{,}750u^2}\div\frac{F}{3{,}000u^2}=\cdot0418\ \text{in Fig. 4}$$

and by

$$\frac{2{,}250}{64{,}686}=\cdot0348\ \text{in Fig. 5}$$

Taking the greatest shear—namely, that at neutral axis—this gives

$$46\cdot83\times\cdot0418=1\cdot96\ \text{in Fig. 4}$$
$$79\cdot58\times\cdot0348=2\cdot77\ \text{in Fig. 5}$$

as the ratio of greatest shear on horizontal and vertical sections to average shear on the same vertical section. With a full rectangular section this ratio is $1\frac{1}{2}$ for homogeneous material. For such a full rectangular section the calculations are, $A=BH$; $I=\frac{1}{12}BH^2$; $M=\frac{1}{6}BH^2T_m$. Total normal force above neutral axis $=\frac{1}{4}BH\,T_m$: Shear stress at neutral axis $=\frac{1}{4}HT'_m=\frac{3}{2}\frac{M'}{BH}=\frac{3}{2}\frac{F}{BH}=\frac{3}{2}\frac{F}{A}$. Here the factor corresponding to the last column in Tables I. and II. is $\frac{1}{4}H=25$ for $H=100$, as in Figs. 3 and 4. This factor is directly proportional to the section-depth.

In Figs. 4 and 5 these stress results are plotted in curve-form. The tensive and compressive stress on the vertical section is represented, as usual, by a straight line. The shear stress on vertical and horizontal sections varies throughout the depth of the web according to a parabolic curve, reaching its maximum at the neutral axis. In Fig. 5, with web of half thickness, this maximum shear is greater than in Fig. 4 in the ratio $\frac{79\cdot6}{46\cdot8}=1\cdot7$. Beyond the junction-corners, between web and flange, the shear stress falls suddenly; but nearly twice as suddenly and through a drop nearly twice as great, in Fig. 5 as in Fig. 4. Throughout the parallel depths of the flanges this shear is precisely the same in Figs. 4 and 5; that is, it is independent of the web thickness for the same T_m, or surface tension and compression. For the same bending moment and the same depth H, however, the T_m in Fig. 5 would, of course, be greater than in Fig. 4.

Applying now the formula

$$S_m=\pm\tfrac{1}{2}\sqrt{T^2+4S^2}$$

to find the maximum shear in oblique directions at each level in the section, from T given by the straight line tension and compression, and from the shear S just calculated, the second set of shear curves in Figs. 4 and 5 are obtained. For this purpose T_m is taken as 100 in each

TABLE III.
Web-thickness=$\frac{1}{3}$-width of flange.

TABLE IV.
Web-thickness=$\frac{1}{6}$-width of flange.

—	Maximum oblique shear S_m	Maximum oblique tension or compression $+T_m$	Maximum oblique compression or tension $-T_m$	Distance from neutral axis h	Maximum oblique shear S_m	Maximum oblique tension or compression $+T_m$	Maximum oblique compression or tension $-T_m$	—
Web	46·83	46·83	46·83	0	79·58	79·58	79·58	Web
	47·27	67·27	27·27	20	78·25	98·25	58·25	
	48·28	78·28	18·28	30	76·68	106·68	46·68	
	49·22	84·22	14·22	35	75·87	110·87	40·87	
Tapered part of flange	49·22	84·22	14·22	35	75·87	110·87	40·87	Tapered part of flange
	43·31	79·31	7·31	36	48·92	84·92	12·92	
	41·19	78·19	4·19	37	42·78	79·78	6·78	
	40·54	78·54	2·54	38	41·02	79·02	3·02	
	40·59	79·59	1·59	39	40·71	79·71	1·71	
	41·00	81·00	1·00	40	41·00	81·00	1·00	
Parallel part of flange	41·00	81·00	1·00	40	41·00	81·00	1·00	Parallel part of flange
	42·64	84·64	·64	42	42·64	84·64	·64	
	45·25	90·25	·25	45	45·25	90·25	·25	
	48·04	96·04	·04	48	48·04	96·04	·04	
	50·00	100·00	0	50	50·00	100·00	0	

case, and the neutral axis shears as 46·8 and 79·6 respectively in the two cases. The ratio of T_m to neutral axis shear varies in every beam along the span from zero at the ends to an infinitely large ratio near the middle or wherever F, the total shear load, becomes zero. With the proportions here taken for illustration, the result in Fig. 4 is that S_m increases slightly from neutral axis to top and bottom of web, then suddenly falling off, and again increasing to maxima at top and bottom of flanges, the maximum here being slightly above the maximum at the top and bottom of web, and decidedly greater than the shear at neutral axis.

In Fig. 5 the maximum oblique shear very slightly decreases from neutral axis to the extremities of the web: from these it drops suddenly through a large range, and throughout the parallel thickness of the flange it has precisely the same value as in Fig. 3, finishing in each design at the value 50=half the surface tension or compression, T_m.

These calculations are set out more exactly in Tables III. and IV. With the thick web, the *increase* of shear from neutral axis to junction of web with flange is 2·4; with the thin flange the similar *decrease* is 3·8. Evidently with an intermediate web-thickness there could be attained, if not exact, still a very close approximation to uniform shear throughout the whole depth of the web. This result, however, although desirable in itself, is not of nearly so great importance as the attainment of good proportions between maximum shear and maximum compression and tension.

Next by using the formula

$$t_m = \frac{T}{2} \pm S_m,$$

there are calculated the maximum tensive and compressive stresses in oblique directions at each level of the section-depth. The results are plotted in Figs. 4 and 5 and tabulated numerically in Tables III. and IV. The existence of these normal stresses on inclined sections, as well as that of the shears on such sections, is generally ignored both in practical text-books of design and also in the "drawing office." Hence the absolute need of extravagant values of what are euphoniously termed "factors of safety." The excess stresses thus absolutely neglected are shown in Figs. 4 and 5 by the areas rafined over obliquely. At the neutral axis instead of the normal stress being zero, as very commonly supposed, in Fig. 4 it is 47%, and in Fig. 5 it is 80% of the surface stress T_m. There is compression in the whole of the lower half of the web and tension in the whole of its upper half. Beyond the junctions of web and flange, the excess normal stress rapidly dies away to an amount too small to show in the plotting of the diagrams. In Fig. 4 the tension at bottom of web and compression at top of web is 84¼% of T_m, although the distance from neutral axis is only 70% of that of the top or bottom surface; while in Fig. 5 at the same places the normal stresses are actually greater than T_m—namely, almost 11% greater. This proves that this flange is too thin—not because of its inability to resist shear, but because it would tear or crush by normal stress in the web before fracture occurred in the flanges.

It may be noted that the curves of maximum tension and compression are, throughout the web depth, nearly parallel straight lines. This results from the shear curve S_m being a very flat curve approximating to a vertical line. If the web were so proportioned as to give exactly uniform shear throughout its depth, or S_m constant, then at each distance h from neutral axis, the maximum normal stress would be

$$t_m = \frac{T_m}{H} h \pm S_m,$$

which is a straight line except for the small variation in S_m.

The examination of these figures will suggest several important problems in the proportioning of the dimensions of I-girder sections, so as to attain maximum efficiency in the utilisation of material to resist the stresses produced by bending loads. One of these is the determination of the correct thickness of the web. Another arises from the fact that in rolled and cast beam sections it would be as easy for the manufacturer to make the web of variable thickness as of constant thickness, as is usual. This is not worth attempting in built-up sections except in large bridge-sizes. A third problem is the economical proportion of flange thickness to whole depth H. A fourth very important problem is the rational determination of the least variation of depth H throughout the length of the span. To call a girder whose depth is varied parabolically in proportion to the bending moment, a beam of "uniform strength," is a good example of the grotesque humour indulged in by writers upon what is called engineering "theory," who look upon engineering as a mathematical amusement of the lighter sort instead of as a serious practical art. The title "beam of uniform strength" has been invented by those who neglect the major half of the stresses which produce risk of breakage, and neglect them because their calculation would occasion them a little more labour and mental trouble than is compatible with the due enjoyment of the comedy.

In conclusion,

it should be pointed out that, although in the parallel parts of the flange and of the web the law $S'_v = t'_h$ is fulfilled by the numbers calculated in these tables, it is not fulfilled in any parts of these or other sections where the sectional breadth varies. In such parts the drag due to vertical variation of sheer stress is supplemented by similar drag due to shear-stress variation across the horizontal width of the section, the sum of the two drags balancing the variation of longitudinal normal stress; or $S'_v + S'_h = t'_h$, the suffices h attached to the S' and t' here indicating two different horizontal directions of stress-variation, one transverse and the other longitudinal. The result of this side shear is that at any level where the section-width varies, the tension or compression at the middle is slightly greater than that at the edges of the horizontal width.

In our "Concrete and Steel Supplement," for July 18th we published some of the working drawings of the coal pocket which is now being erected at Gravesend at the Northfleet Works of the Associated Portland Cement Manufacturers, Limited. It was stated in connection therewith that this was being erected on the Kahn system by the Trussed Concrete Steel Company, of Caxton House, Westminster. This was an error. The fact is that it is being erected on the Kahn system with bars supplied by the Trussed Concrete Steel Company, but the actual work of construction is being carried out by the Associated Portland Cement Manufacturers, Limited.

NOTES AND NEWS.

The value of the imports of cement into New York, which had fallen from £75,000 in 1903 to £24,000 in 1904, show a further reduction to £19,000 in 1905. The total importations into the United States have fallen off much in the same way during the three years in question—namely, from £605,000 in 1903 to £277,000 in 1904, and to £220,000 in 1905. The largest supplies come from Germany and Belgium, but these are diminishing year by year as the production in the United States increases. The total production of hydraulic cement in the United States in 1905 is estimated at about 34,000,000 barrels of 380lbs. nett, of which 1,026,502 barrels were exported, the value given being about £278,000.

New Works in Ferro-Concrete. — Subjoined is a list of contracts which have been settled recently by various licensees under the Hennebique patents. The most important works included in the list are the Parkstone Quay Extension and Transit Shed for the Continental Station of the Great Eastern Railway near Harwich.

MAKING-UP ROOM, &c., CHURCH, NEAR ACCRINGTON, for Messrs. Steiner & Co., Ltd.

COAL WASHERY, CARDIFF, for the Cardiff Wash Coal Co., Ltd.

"STELLITE" WORKS, ASTON, NEAR BIRMINGHAM, for Messrs. Vickers, Son & Maxim.

TANK AT MESSRS. ERICSSON'S CABINET WORKS, BEESTON. A. N. Bromley, F.R.I.B.A., Architect, Nottingham.

ORDNANCE OFFICE, SOUTHAMPTON. Floors for H.M. Office of Works.

COAL BUNKERS AND FOUNDATIONS FOR CORPORATION ELECTRICITY WORKS, ROCHDALE. S. Sydney Platt, M.Inst.C.E., Borough Engineer.

GRAIN SILOS, for Messrs. E. C. Robson & Son, Sunderland.

GOLF PAVILION, QUEEN'S PARK, BOURNEMOUTH, for the Borough Council. F. W. Lacey, M.Inst.C.E., Borough Engineer.

TANK AT THE CORPORATION BATHS, BELFAST. Henry A. Cutler, City Engineer.

COVERING OF RIVER FROME, for the city of Bristol. Thomas H. Yabbicom, M.Inst.C.E., City Engineer.

GALLERY AND COLUMNS FOR KING'S THEATRE, SUNDERLAND.

PREMISES FOR Y.M.C.A., LEEDS.

EXTENSION OF PARKESTON QUAY, for the Great Eastern Railway Company. Engineer: John Wilson M.Inst.C.E.

TRANSIT SHED AT PARKESTON QUAY, for the Great Eastern Railway Company. John Wilson, M.Inst.C.E., Engineer.

Two steel wharves, with concrete piers, are to be built at Manila for the United States Government. One of these will be 650ft. long and 110ft. wide, and the other 600ft. long and 70ft. wide. The floor framing consists of transverse plate girders resting on the piers, and carrying between their webs longitudinal lines of 18in. rolled steel joists. Over these is a concrete slab floor 4½ins. thick, reinforced by embedded sheets of expanded metal or wire netting. To protect the face of the wharf there will be wooden fender piles driven in front of it and connected by waling pieces, while spiral springs will be inserted between the piles and the ends of the plate girders. For each concrete pier there are five or seven wooden piles 65ft. to 75ft. long, driven so that they form a core or pyramid above the bottom, with the middle pile 15ft. or 20ft. above the ground. Steel cylinders, of $\frac{5}{16}$in. plate, are then placed over the groups of piles and sunk some 6ft. or 8ft. into the bottom. Above the level of the top of the highest pile the cylinder tapers to a smaller top diameter. The mud is then pumped out, vertical steel reinforcing bars are set in place, and the cylinders are then filled with concrete. At intervals the vertical bars are connected by horizontal hoops and radial bars. The piers are 6ft. diameter, tapering to 3ft. at the top. They are 20ft. apart transversely and 25ft. apart longitudinally.

REINFORCED CONCRETE SYSTEMS.

IV.—The Coignet System.

Undoubtedly one of the earliest workers in both the practice and theory of reinforced concrete construction was M. Edmond Coignet. We referred in an article in our "Concrete and Steel Supplement" for June 20th to the fact that M. Coignet stated, in 1888, before the French Society of Civil Engineers, his ideas regarding the reinforcement of concrete; and that he read, with M. N. de Tedesco, in 1894, before the same Society, a paper on methods of calculation. M. de Tedesco has for long been associated with M. Coignet. To Messrs. Coignet and Tedesco belongs the honour of having first conducted scientific experiments which enabled a rational theory to be established of the stresses and strains in structures of reinforced concrete, and it was from their researches and published information that M. Considère, Inspector-General of the Government Department of Ponts et Chaussées, was induced to interest himself in the subject and carry out, with Government assistance, the extended series of experiments which enabled him to so greatly assist in the determination of factors necessary to a more complete understanding by the engineering profession in general. M. Considère only confirmed, however, as regards the more important factors, results that had been previously obtained by Messrs. Coignet and de Tedesco. Naturally, with the resources which he had at his command, he was able to more fully investigate points that they had to leave for future determination, and he substantiated those facts which they had already satisfied themselves upon.

M. Coignet is not only a qualified civil engineer, but he is

one of the largest contractors in France.

His business was left to him by his father, M. François Coignet, and it was from the practical experience of his father that M. Coignet, with his theoretical training, was enabled to advance as he has done. We referred in the article above mentioned, in our issue for June 20, to M. François Coignet and his patents, and we may repeat that his first patent was taken out in 1855 in both France and England for the making of concrete from hydraulic limes and various aggregates. Béton aggloméré, as this lime concrete made in a special manner was known as, was also called Béton Coignet from its inventor and his large use of it in practical construction in Paris and elsewhere. In the English, although not in the French, patent he referred to the fact that he constructed reinforced floors with crossing rods. In 1861 this Coignet published a pamphlet which has been called his memoirs. In this he advised the introduction of metallic framework to reinforced concrete, and described its various possible applications and the manner in which he had made use of it, so that we see that he antedated Joseph Monier's patent of 1867 which, as we have before stated, only dealt with the construction of flower pots at that time, being extended in 1873 to cover its use for reservoirs, bridges, &c.

M. François Coignet,

as a contractor and inventor of Béton aggloméré, had constructed many large works in concrete, some of which were reinforced with metal. It appears that

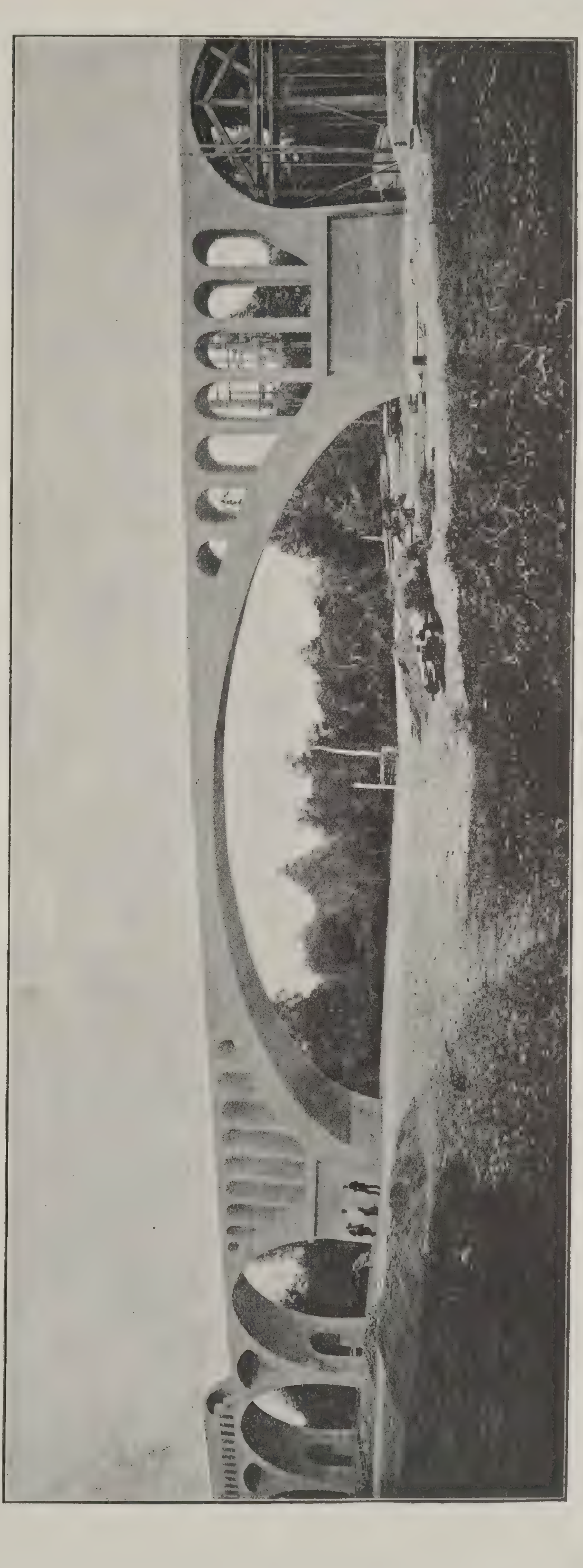


FIG. 1—THE PRINCIPAL ARCH OF THE AQUEDUCT OF THE RIVER VANNE (PARIS WATER SUPPLY) CONSTRUCTED BY FRANÇOIS COIGNET.

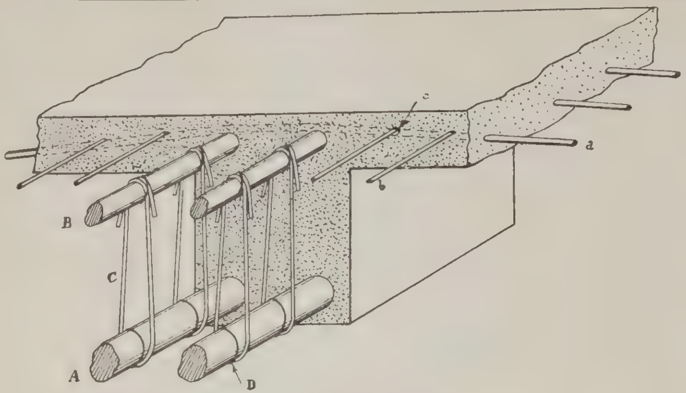


FIG. 2.

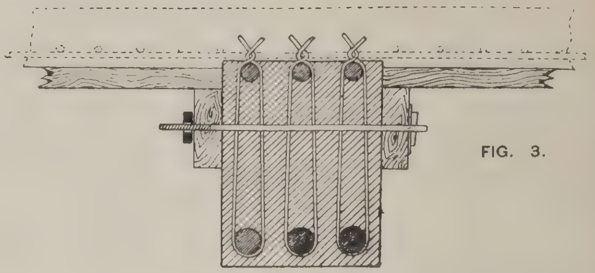


FIG. 3.

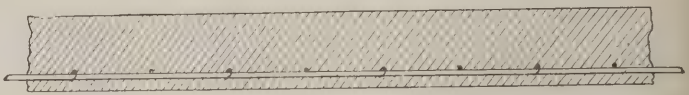


FIG. 5.

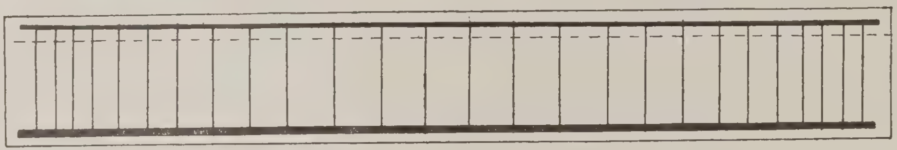
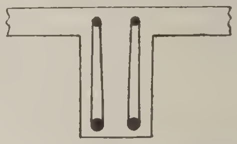


FIG. 4.



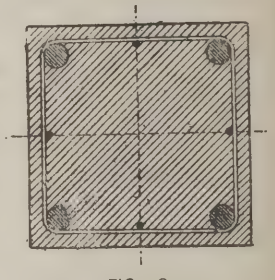


FIG. 8

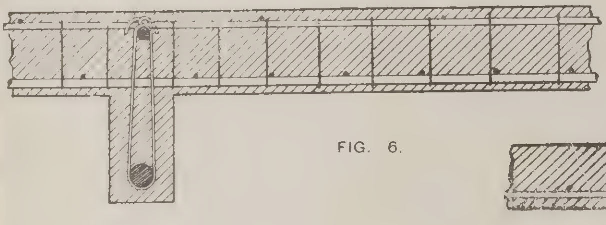
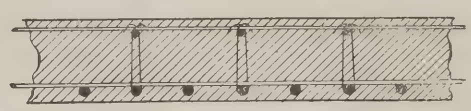


FIG. 6.



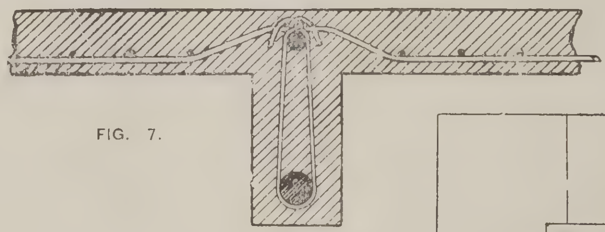


FIG. 7.

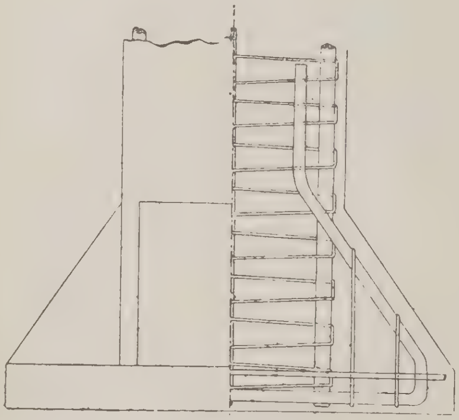


FIG. 11.

SOME APPLICATIONS OF REINFORCED CONCRETE ON THE COIGNET SYSTEM.

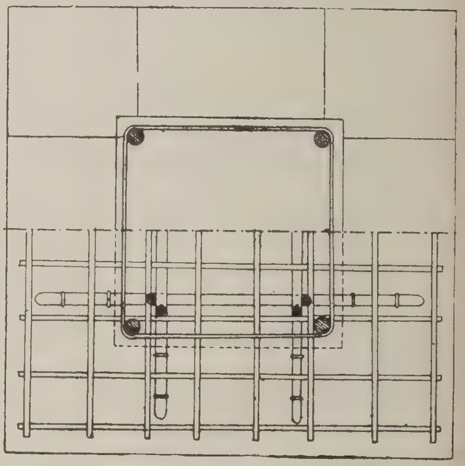


FIG. 12.

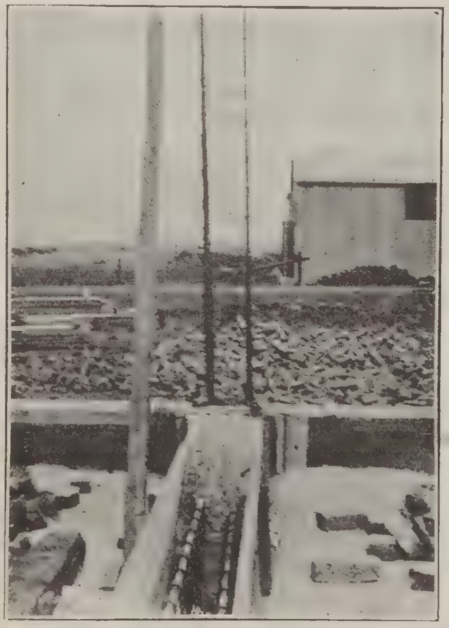


FIG. 9.

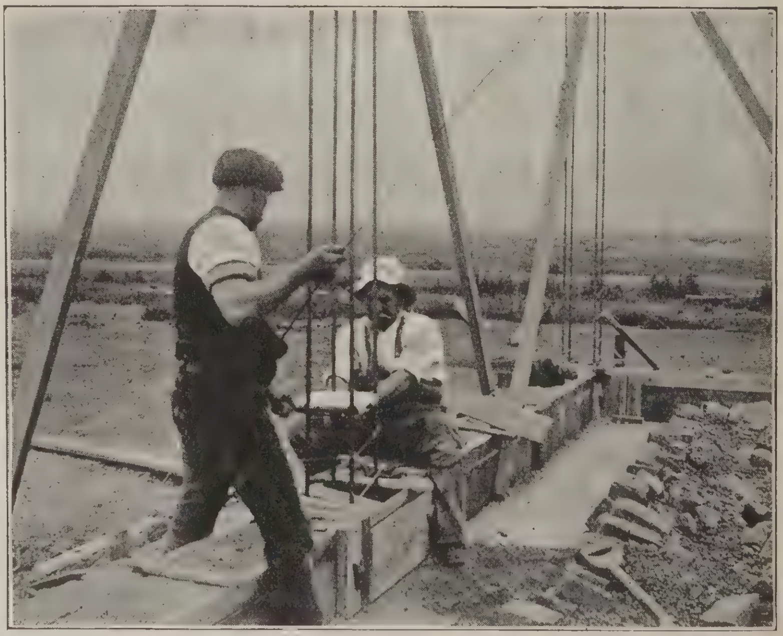


FIG. 10

he constructed over 200 miles in France and at Odessa in Russia, 38 miles of aqueduct for the Paris water-supply from the river Vanne, five miles of which include arches from 99ft. to 132ft. span, the church at Vesinet, near Paris, the high retaining walls of the Passy and Trocadero Cemeteries in Paris, a lighthouse 172ft. high at Port Said in Egypt, &c. M. Francois Coignet died in 1887. Of his work above referred to we publish one illustration herewith — namely, the principal arch of the Aqueduct de la Vanne (Fig. 1). This arch has a span of 132ft., and is reinforced with metal rods at the top only, the rest being of plain concrete. Of course, the application of reinforcement by this contractor was purely experimental, and it was left to his son to determine the method of calculating this reinforcement.

M. Edmond Coignet,

who two years ago established a branch office in this country, was educated at the Central School of Arts and Manufactures in Paris. From the time of his father's death the idea of reinforcing concrete with steel was slowing maturing until 1892, when the whole subject seemed to be in the air, and resulted in Cottancin, Hennebique, Bordenave, and Bonna bringing out their various special systems. In 1892 to 1893 the Ville de Paris proposed to construct the aqueduct of Achères on the old method—namely, constructing circular galleries in masonry, part above and part below ground. M. Edmond Coignet, knowing the advantages which had been obtained by the employment of reinforced concrete, brought the matter before the authorities and offered to construct the aqueduct in reinforced concrete at a much reduced cost over the proposed masonry design. He managed to convince the authorities of the advantages, and he was granted this important contract. The elevated portion was of circular section, 10ft. in diameter, with external stiffening supports spaced about every 6ft. apart; this portion was one-third mile long. The underground portion was elliptical in form, 17ft. wide, and 1½ miles long.

From this time the application of reinforced concrete became general and of ever-increasing magnitude in France. We may mention that the Paris International Exhibition of 1900 was the means of emphasizing the advantages of reinforced concrete, and M. Coignet was responsible for one of the most striking demonstrations in the shape of

The Chateau d'Eau,

which was a much-admired wonder. It was only owing to the peculiar qualities of reinforced concrete that it was possible to execute rapidly such a daring and graceful scheme. M. Coignet was granted the Grand Prix (Class 28) for his works in reinforced concrete at this exhibition, and he also obtained the Gold Medal (Class 29) for the architectural designs of his constructions. The authority which the opinions and experience of M. Coignet have in France is shown by the fact that he is a member, both in the technical and the practical sections, of the Committee which has been appointed by the Department of Public Works to draw up rules for the design of the reinforced concrete structures.

Systems of Reinforcement.

As we might naturally expect from his profound knowledge of the theory and practice of the subject, M. Coignet does not bind himself to any hard-and-fast forms of reinforcement, recognising that special circumstances may require special treatment; yet, on the other hand, of course he has convinced opinions and has adopted certain well-defined methods of meeting ordinary conditions. The rods he uses are of round section and without any mechanical bond.

In Beams

M. Coignet always makes use of top as well as bottom reinforcement. The introduction of these top rods in the compressed portion of the beam adds to the compressive resistance and makes it possible to diminish the section of the concrete, thereby lessening the dead weight of the beam. Another advantage in M. Coignet's opinion is that these top rods help to strengthen a floor when subjected to fire in so far as they suspend the bottom rods and keep them in position if they should be exposed by the action of fire and water. The third advantage is that the use of top reinforcement enables beams to be prepared in the same manner as piles, which can be hoisted into position and made to support the centering for the slab by a special arrangement, illustrated in Fig. 3, in which case the centering may be removed after two days.

The top and bottom reinforcements

are connected by stirrups which serve the purpose of resisting the shear. The manner in which these are placed will be seen in Fig. 2. Round rods of small section are simply turned over at the top and bound in position with annealed wire as shown at D. It is obvious that a fairly good connection is thus obtained between the shear members and the longitudinal rods, and these may be depended upon to resist sliding such as may occur with loose stirrups when the load on a beam approaches its ultimate strength. When the shear is so great as to render it necessary to obtain some rigid connection of the shear members, M. Coignet simply turns up one of the rods in an inclined direction, which he can easily do, for he generally uses a number of rods in the underside of a beam. The spacing of the shear members conforms to the general practice in being closer together towards the points of support as shown in Fig. 4.

The connection of the floor slab

with the beams is illustrated in Figs. 2 and 6. The floor slabs are usually made from 4 to 5ins. thick, with an armature of principal bars running in the direction of the shortest dimensions between supports, and a secondary system of crossing bars of smaller sections than the others as shown in Fig. 5. The crossing rods are bound together with annealed wire at every other intersection similar to what has been called the Monier system. When the span or the load, or both, are considerable, the slab is constructed of greater depth, and in the form shown in Fig. 6, similar to beams with top and bottom reinforcements connected by stirrups. Where such slabs are combined with ribs, the lower principal bars do not rest on the upper compressed members of the ribs as might be supposed from the method adopted with the beams, but run through as shown to the left in Fig 6. Another method is adopted in which the slabs are only 3 or 4ins. thick, supported by ribs spaced only a few feet apart and resting on the main beams or on the walls, shown in Fig. 7. This method is used principally for mills, warehouses, platforms, and generally where the loads are considerable, or the spans between the supports large. These ribs are generally exposed in buildings of the factory class, though in certain cases where the appearance is studied a ceiling is provided and fixed to the underside of the ribs, leaving a space between. When a slab is connected with a beam calculations are based on a **T** section, the slab being assumed to take part of the compression.

Posts, pillars or columns

are made round or square. The longitudinal bars are bound by spiral rods, spaced every 3 or 4ins., annealed wire being used to connect these at all intersections. A section is shown in Fig. 8. We illustrate in Figs. 9 and 10 posts in course of construction showing these spiral bindings. The method by which the work is executed is shown in Fig. 10, where it will be seen one man holds a square piece of wood with a handle to keep the longitudinal rods apart while a small rod is being wound round. Fig. 9 also shows a Coignet beam

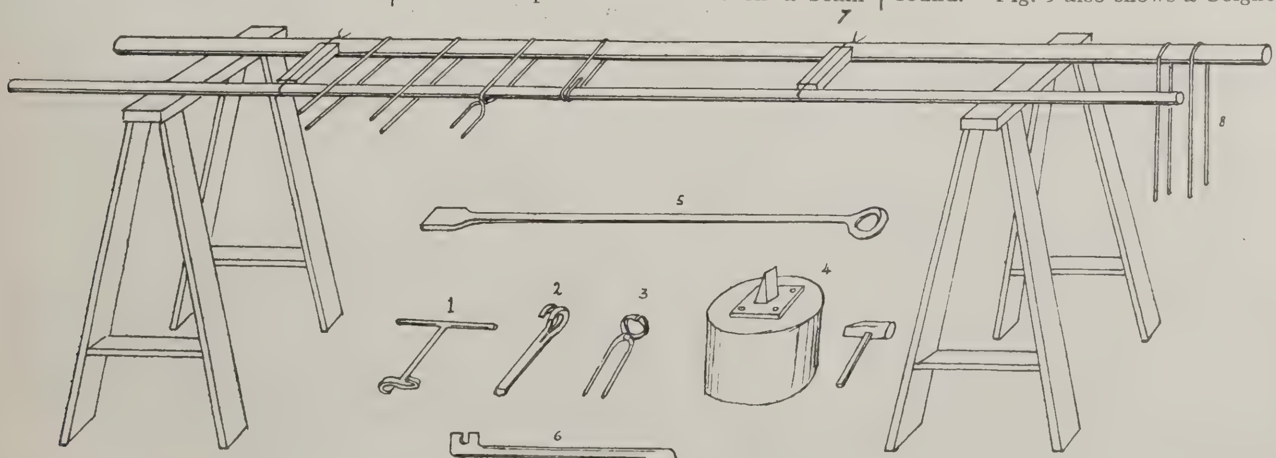


FIG. 13.

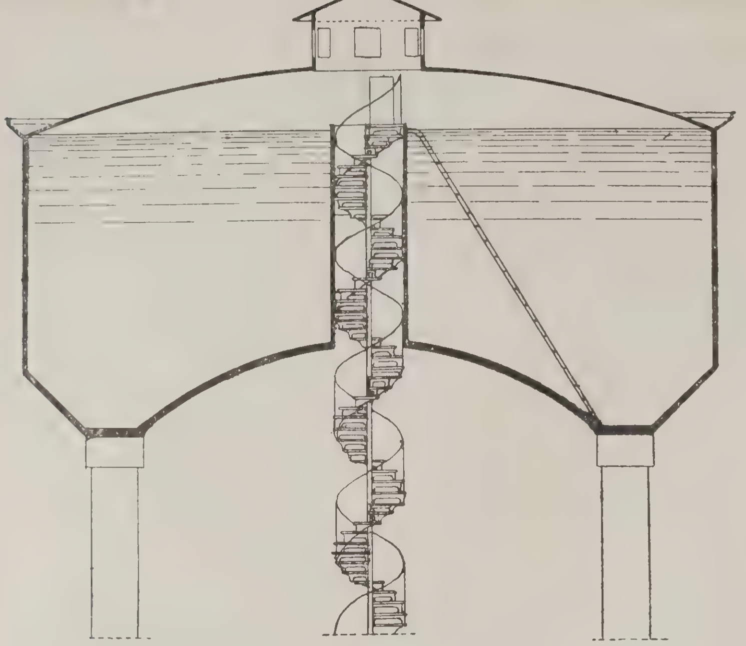


Fig. 14.

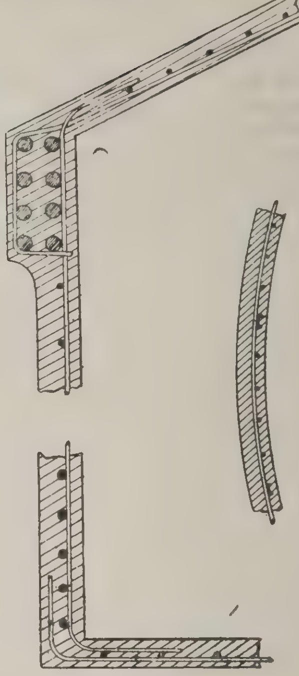


FIG. 15.

with skeleton exposed and concrete partially filled in between the centering. These two illustrations are photographs of the work now in course of erection at Rainham, Essex, which is referred to below. The footings generally used for these pillars are shown in Figs. 11 and 12.

The Coignet piles are also made similar to posts—namely, with rods wound spirally round the longitudinal bars.

The manner in which the beam reinforcement is manipulated will be easily understood from the diagram of **tools and appliances** in Fig. 13. The working drawings which are supplied to licensees indicate the exact dimensions and positions of the various bars. Certain special tools are necessary for bending, twisting and cutting the rods, as also several special trestles for carrying the upper and lower bars which constitute a portion of the framework of a beam during the process of making the stirrups. These two bars are laid parallel to each other on trestles, and kept at the required distance by pieces of wood, as shown at (7) in the figure. These pieces of wood are removed as soon as the stirrups are made, the annealed wire binding these latter to the bars being sufficient to hold them in position while they are placed in the box centering. A special gang of men can be set to prepare these frameworks, which do not need skilled labour. Bars composing the armatures of slabs are arranged on the centering according to the plans.

We may now describe more particularly the tools used for the work. At (1) is shown a twister for making a knot in a stirrup; at (2) is a wrench for bending the ends of stirrups over the top bar; (3) are cutting pliers for making the annealed wire bindings; (4) is a wooden block with chisel on which stirrups are cut to their required length; (5) is a special tool for ramming the concrete round the framework of the beams; (6) is a wrench for bending bars of about $\frac{1}{2}$in. diameter; at (8) are shown stirrups bent in the middle and hanging over the principal bar ready for use.

When the frameworks of beams are placed inside the box centering false pieces of wood are used to keep the armatures in their proper position; the concrete is then thrown into this mould and well rammed round the bars. The principal and secondary bars for the slab are next put into position on the top of the beams and the concreting of the slab then completed. The framework of the slab is lifted during the process of the work in order to leave the required distance between the bars and the undersurface of the floor.

As regards the method of centering adopted by M. Coignet, planks of about 1in. thick are generally used, and care is taken that the centering should be quite rigid in order to stand the ramming of the centering without sagging. The portions of the centering under the slabs can be removed after a few days. The concrete used is generally in the following proportions:—3 parts Portland cement, 5 parts river sand, 10 parts ballast, broken bricks, slag or clinker aggregate. This mixture naturally contracts in volume and in the result there are about $12\frac{1}{2}$ parts of concrete. The weight of such concrete, including the usual percentage of iron, is taken at about 156lbs. per cu. ft. The cement used is slow setting. M. Coignet takes the compressive strength of such concrete at 2,225lbs. per sq. in., but allows in his calculations a factor of safety of $3\frac{1}{2}$, so that 635lbs. is considered a maximum for the fibres bearing the greatest stress in the deflected body. The reinforcement consists of mild steel with a tensile strength of about 58,000lbs. per sq. in. with an elongation of 22 per cent. on 8ins. The same factor of safety—namely, $3\frac{1}{2}$—is taken for steel, the maximum tensile working stress being taken is 16,600lbs. per sq. in.

M. Coignet recently published a statement of the basis upon which his calculations were made, from which it is plain he uses the ordinary methods such as advocated by Professor Ritter and adopted by the German Government. The modulus of elasticity of concrete is taken as fifteen times less than that of steel. The tensile strength of concrete is neglected.

A large tobacco warehouse is being erected at Cumberland Basin, Bristol, at the present time on the Coignet system under the supervision of the Docks engineers, the contractors being Messrs. W. Cowlin & Sons. New premises for Messrs. J. C. & J. Field, Ltd., are also being constructed at the present time on the Coignet system at Rainham, Essex, of which the architects are Messrs. Scott, Hanson & Frazer, and the contractors Messrs. W. King & Son, both of London. Two views of this work are shown above. The foundation work here was somewhat difficult on account of the peculiar and unreliable nature of the ground, which is composed of about 6ft. of hard silt resting on peat.

In our issues for February 15th and 22nd, 1905, we illustrated a bridge at Luxemburg which was constructed on the Coignet system. This bridge is a very remarkable one, and has a span of 256ft. The beams which support the deck platform were made in advance.

A number of reservoirs and tanks above and below ground have been constructed by M. Coignet. Fig. 14 is a sectional view of such as erected at Toulon or Lorient Arsenals and at the water works at Eu, Tréport and Mers. The walls are only about 3ins. thick, including the rendering. The framework is made of upright bars encircled by spiral tie-rods, as shown in Fig. 15. The framework bears the bursting pressure, the concrete being merely considered as a stiffening material and to contain the water.

Fig. 16 shows the armature for pipes adopted by M. Coignet.

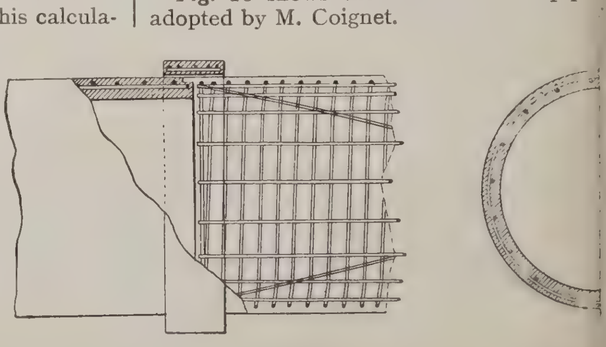


FIG. 16.

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A Modern Requirement. IN modern houses, both town and country, there is one detail in the necessary accommodation which is generally overlooked by the architect, namely, the provision of some place for the storage of cycles. In the majority of houses of any size the cycle is generally in evidence, and even in smaller-class property some provision for it is necessary, in view of the fact that so many workmen now go to and from their work on bicycles. One only needs to take as an example some house built, say, twenty years ago, having no separate outbuilding, in order to appreciate the difficulty of keeping bicycles at all conveniently. Even though some room above stairs may be used, it is clearly most unsatisfactory, and the same defect applies to rooms in a basement. Hence, whatever provision is made must be on the ground-floor level. In those houses where no space for the storage of machines has been allowed for, the occupier has to resort to all kinds of ingenuities and contrivances, such as hanging the machine on the wall, or slinging it from the ceiling, and where some sort of an outhouse does exist, more often than not it is so damp and musty as to be quite unsuitable for the storage of bicycles. Architects should bear this point in mind when planning houses. What is wanted is some small space (preferably under the main roof) with a dry floor, and lit through a window, where two or three bicycles can be conveniently kept. It is no use providing a sort of dark cupboard where to stand upright is impossible, because then the machines would have to be pushed in from the back as best might be, which is not at all desirable. It is preferable that the space should be provided in the kitchen or scullery portion of the house and near an outside door. Even if occupants of the house for the time being do not happen to possess bicycles, the space can be made use of for many other purposes.

Insight. An artist is not great because he deals with the abstruse. It is true that it takes a great artist to treat the higher problems adequately, and that his genius is given its greatest opportunity in such work. Genius, however, may be displayed in the most commonplace things of life, so transforming them that we realise in the form given to them something which we feel to be sublime. The artist, indeed, brings to the subject an insight beyond ours. Someone has said that we are all slaves to words. Words generally either too closely define a view or convey a wrong impression. They are deceptive and paradoxical, in that they very often convey the opposite to what is meant. They must necessarily be of the nature of contrast. To our present subject this applies in two ways. In the first place insight is too narrow a term to apply as all-sufficient. The artist must also have a wide outlook. Secondly, the use of the words "art" and "science"—terms which imply a contrast, a divergence from each other—is more often than not wrong in architecture. Neither has a separate existence from the other. Indeed, it ought to be held that they are but two aspects of one and the same thing. Insight and outlook are as all-important in science as in art. The artist, because of his insight, may be held to have proved himself a scientist. He investigates causes and applies the knowledge thus gained to creative work. By insight does he widen his outlook. He looks at things scientifically. Just so the architect of genius. It is too common a fault to laud him an artist, and contrast him with the scientist, when the faculty necessary to his development is what has been called a scientific way of looking at things. The great architect will treat the most commonplace details with an originality that results from a greater insight and a wider outlook than his more ordinary brethren. It is unwise to adulate art and to scorn science. Such conflicting terms would be better left alone and *architecture* practised with intent. If we find anyone saying this or that is engineering, therefore scientific and to be avoided by the artist—so far thou shalt go and no further—we should cry "halt," this is the brink of the unknown, the inner relations of which are indeterminate. Let us take the problem, look at it from every point of view, and effect its solution without worrying as to whether it is within the architect's province or not.

The Newer Joinery. IT is a particularly noticeable feature of modern joinery that the joints are gradually becoming more and more simple than they used to be. Doubtless we should quickly approximate to the methods of American framing were it not that the time-honoured traditional methods are taught to architects in the standard books on building construction. The use of machinery and the saving of time and labour that has been rendered necessary by reason of the increase in wages have alike resulted in changes. The old-time joiner eliminated nails as much as possible. The modern joiner avails himself of them wherever possible. There is much to be said for and against various details, but upon the general issue we think the change is for the better. Indeed, further simplicity would not come amiss. Economy is an important factor, and by care we can achieve almost as lasting a result as by traditional methods. There is, undoubtedly, much beauty in well-executed joinery, but very often it is thrown away by being put in positions where it is never likely to be properly seen or appreciated. Where work is of a monumental character and intended to last for centuries the best work should be insisted upon by all means, and, if economy must be studied, simplicity resorted to, but it is obviously out of place to put too much labour into buildings certain to have a comparatively short life. We are of course strongly against anything like shoddy work where flashy finish is obtained at the expense of durability. The position should be faced frankly and made the best of; the old system has departed and it is no use deploring.

KIRKWALL CATHEDRAL.

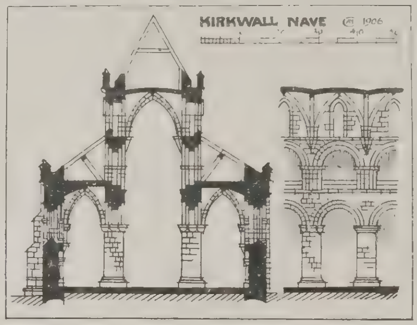
The cathedral of St. Magnus, at Kirkwall, was begun in 1137 and not finished till the sixteenth century. From 1688 till 1846 it was occupied by a Presbyterian congregation; it was then restored by Government, and since 1856 it has again been used as the parish kirk. With such a history the church might well be a jumble of incongruities, if not a mere skeleton of its proper self. Instead of this there is a striking unity of idea throughout the building. Some of the detail, especially of the later portions, rivals the best contemporary English work, and, although the scale of everything is small, the effect produced is, owing to the proportions, thoroughly impressive. Moreover, in spite of the church's history for the last three centuries, it has escaped the crowning degradation of a restoration such as has been perpetrated in too many of our own English cathedrals.

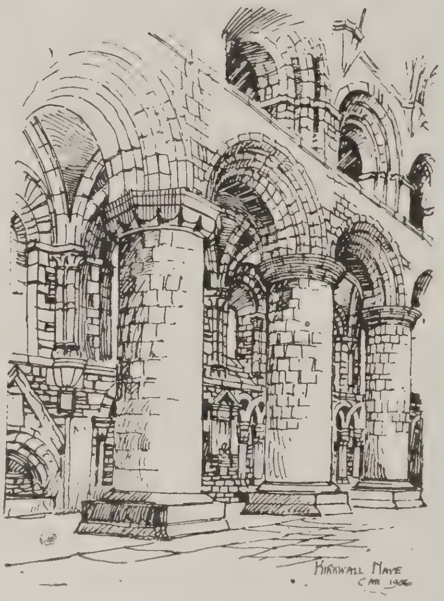
Kirkwall is a second or third class church in point of size, and in this respect it may be compared with Romsey or Norman Carlisle. Its founders, Kolr and Earl Ronald, only completed the choir and transept with one or two bays of the nave. The original plan consisted of an aisled choir of three bays, probably with an apse, a crossing and transepts of two bays each, two transeptal chapels and an aisled nave of six or seven bays.

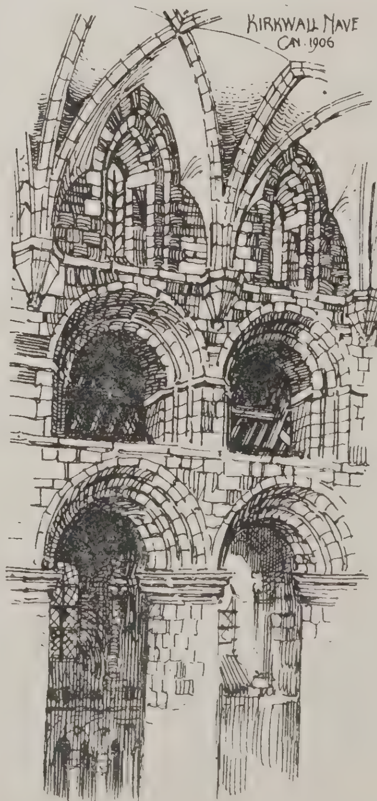
The piers are mostly cylindrical. The arches in the choir are rather richly moulded with dentils and zig-zag notchings, those in the nave and throughout the triforia being in three plain recessed rings, in some cases chamfered. The Norman windows have monolith shafts and moulded arches inside and out; the choir aisles are vaulted with heavy moulded ribs and cross arches. There is a dado of intersecting arcading in the nave aisles and transepts. The choir and transepts were unvaulted, and had dripping eaves on corbels, indications of which remain below the later parapets.

After the dedication of the choir, the church was continued westwards in a leisurely fashion till well on into the thirteenth century. The nave arcade and triforium have round arches throughout, but the round piers of the western part of the nave have moulded capitals instead of the Norman cushion caps used in the earlier parts of the church. The westernmost pair of piers have round moulded bases instead of square plinths like all the others. These are of much later date than the rest, and were probably built in the fourteenth century after the western doorways.

While the nave was in hand, at the end of the twelfth or early in the thirteenth century, the tower piers and arches were rebuilt with keel-shaped coursed clustered piers, square caps carved with angle volutes, and pointed arches with chevron ornaments and rather rich mouldings, and the tower was carried up to the ridge line. Chapels were at the same time added to the north and south transepts, as had been contemplated in the original setting-out of the church. These are vaulted, and have pointed lancet windows with shafts and square carved caps. The outer roof over the south-east chapel consists of red sandstone slabs upon a solid pointed barrel vault; the corresponding chapel on the north side has an ordinary slated roof.



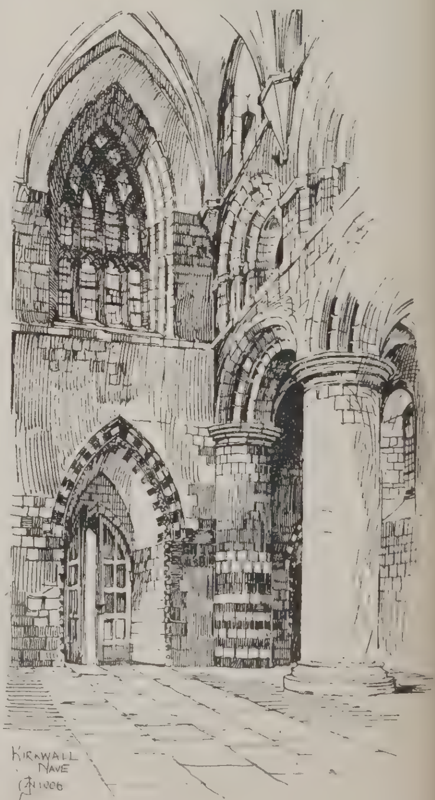




Soon after the completion of the crossing arches the choir appears to have been vaulted in, the transept gables rebuilt or completed, and the building of the nave clearstory and the vaulting of the nave and aisles proceeded with. The high vaults of the choir spring from short vaulting shafts inserted in the old walls, and these vaults have moulded ribs. The nave and its aisles have plain quadripartite vaults with simple chamfered ribs, and no ridge or wall ribs; the high vaults in the nave spring from octagonal corbels at the level of the clearstory string-course; these corbels are finished with carved heads and are somewhat similar to fourteenth century Irish work.

The three western bays of the nave, and two in each aisle were not vaulted till 1846, and then only in lath and plaster, the west end of the nave having been extended at the end of the thirteenth or early in the fourteenth century, and the vaulting of the extension never having been completed—perhaps on account of a somewhat alarming settlement which occurred in the second pair of pillars from the west end during the process of alteration.

Towards the close of the thirteenth century the apse was taken down, the choir lengthened three bays, and the present west front built up to the sill of the west window. A doorway was formed in the south transept front, and the dripping eaves of the choir and transepts were replaced with gutters and parapets, the nave parapets being probably contemporary with the clearstory. The tower was at this time carried up to its present height and capped with a timber spire, which was burnt in 1671.



The work of this period is of great beauty and refinement. The choir extension has round arches on finely-clustered solid piers, the arches richly moulded, the abaci indiscriminately round and square, the caps carved. The triforia over these arches have recessed semi-circular openings in harmony with the Norman work; the clearstory and aisle windows are pointed, with shafts in the jambs and well developed "early Gothic" detail. There is a tall four-light east window with a twelve-bayed marygold filling the whole of its head and a steep crocketted gable over.

The high vaults of the choir seem to have been renewed at this time, some earlier materials being worked in. The ribs are of various sections (10 varieties), and this vault has wall ribs and an arched ridge rib in addition to the ordinary transverse and diagonal ribs. In the eastern bays it springs from vaulting shafts starting from the pier capitals.

The base of the west front is contemporary with, or a little later than, the choir extension; it has three doorways of delightful proportion and delicate detail, and the same may be said of the south transept entrance. These doorways are tall and narrow with great depth of mouldings, rich clusters of monolith shafts, and round foliated caps very much undercut. The nave doorway, which projects with a gable over it, has five orders of mouldings in red and yellow sandstone in concentric rings; the aisle doorways do not project and are each in four orders, as in the transept doorway. The north-west doorway has concentric bands like the central one, the south-west arch is arranged with alternate voussoirs forming continuous stripes or rays across the mouldings; the transept doorway has also alternate voussoirs, but so arranged as to form a chequer pattern on the arch. The shafts are all of red sandstone and much decayed; several members of the mouldings are enriched with dog-tooth, and the gable over the principal entrance was once flanked with pinnacles, which have been destroyed. The red sandstone has stood better than the yellow, and the latter has been repaired with plaster in the case of the south transept doorway, but the texture of the work in its present condition is charming; and it is to be hoped these doorways, which recall somewhat the much richer and larger ones at the west end of Genoa Cathedral, and which are, in the writer's judgment, almost unrivalled in the refinement of their proportion and detail, may be tenderly dealt with in any restoration which awaits them.

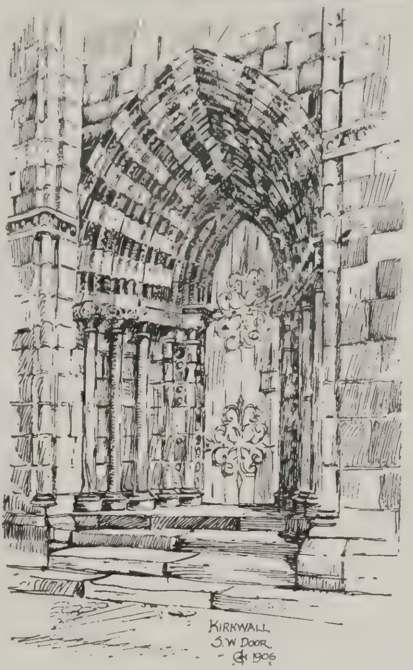
A somewhat earlier doorway in the north aisle has a finely proportioned semi-circular arch on "Early English" columns with a steep gable over, but this has been restored and, to a great extent, spoiled in the process.

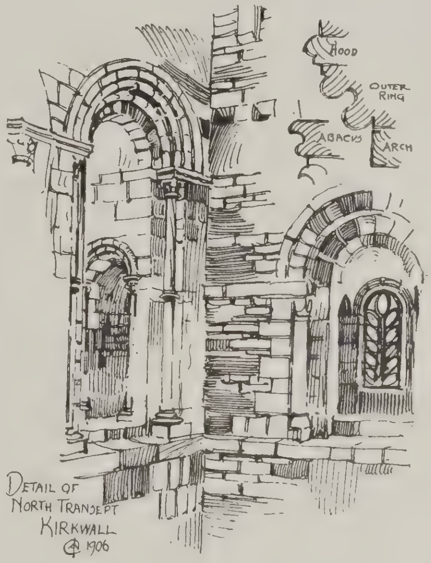
Some portions of the west end of the nave are built in polychrome like the doorways, but the two west bays of the aisles are late fourteenth- or fifteenth-century work with cusped lancet windows, and the upper part of the west front was probably rebuilt by Sir George Hay, of Kinfauns, to whom the lands of the see were leased by the Crown in 1624. His arms are carved over the west doorway, and it is recorded that in 1606 the then Earl of Caithness had begun to pull down the church.

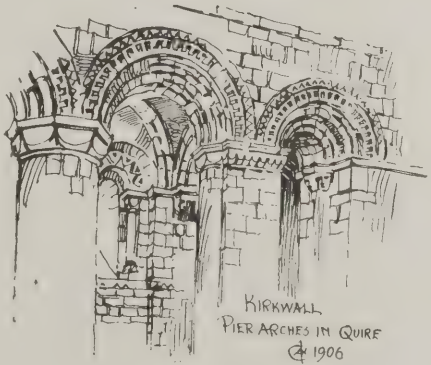
Most of the pinnacles on the different fronts appear to be late work, and may possibly have been added or rebuilt in the seventeenth century.

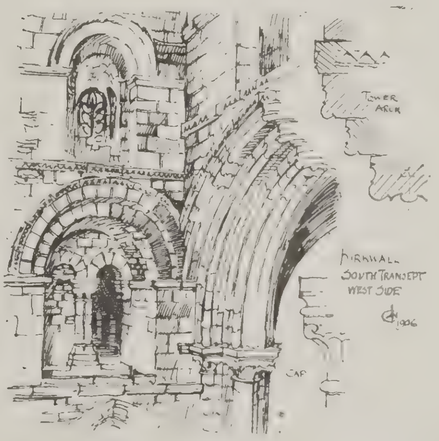
The tower above the great arches is apparently early fourteenth-century work. Its walls are double and honeycombed with passages; the interior is carefully finished, and may have been intended for a lantern open to the church, in which case the bells must have hung in the spire, but this is doubtful, as the tower was burnt out in 1671, and the present floors and roof are of the seventeenth century or later.

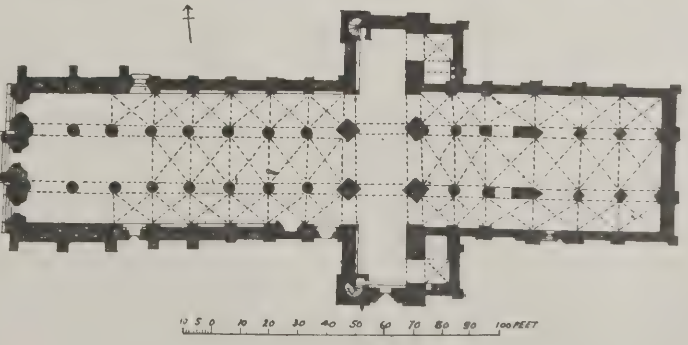
The church contained five altars; there are no remains of the font or of any old glass, but a few fragments of the choir

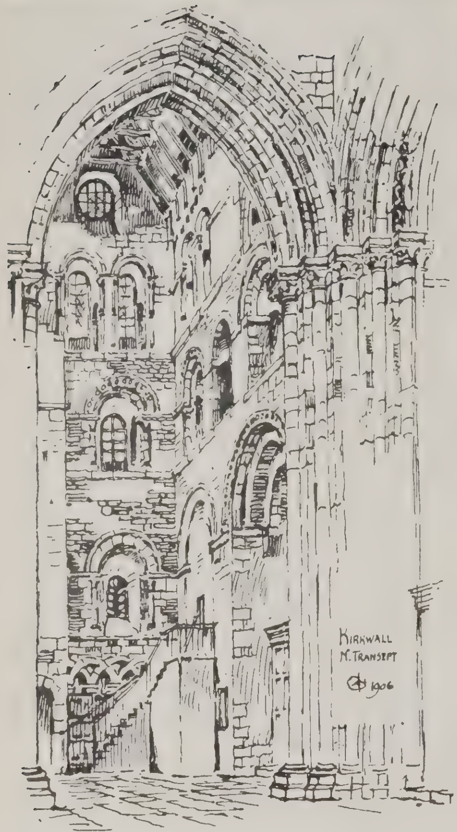












stalls and bishop's throne are preserved in the south transept. The work of these resembles that of the stalls in King's College Chapel at Aberdeen. The church is full of old monuments, some medieval, others of the seventeenth century, some of considerable merit, but of which a mere catalogue would be of little general interest in itself.

The choir is parted from the church by a trumpery glazed screen of 1856, and its proportions have been injured by raising the floor to the level of the old sacrarium. It is pewed and galleried and the triforium arches blocked with lath and plaster; the clearstory, too, is spoiled by having been glazed with double windows on both faces of the wall. Otherwise the church has not suffered at the hands of its occupiers, and it is in many respects well cared for and appreciated.

Apparently in the eighteenth century the windows were all reglazed with wood frames divided by curved wooden sash bars, the effect of which is very good. Unfortunately, several of the windows have been reglazed in modern times in cathedral glass, and two or three of the aisle windows have been embellished with very mediocre figure subjects.

An excellent and concise account of the cathedral has been written by Sir H. Dryden, and the writer of this article must acknowledge his indebtedness to the work referred to for most of the chronological facts mentioned by him. It should be added that the theories of Sir H. Dryden as to the history of the fabric seem justified by the evidence of the architecture.

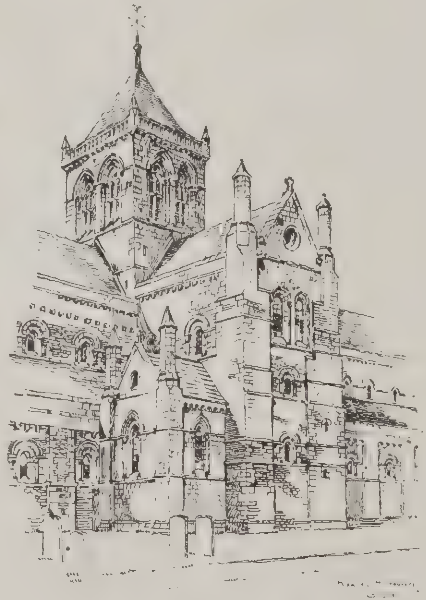
From the point of view of an architect the main interest of the church is the fact that so imposing a result should be obtained upon so small a scale. Externally, no doubt, the extreme simplicity and straightforwardness of the grouping of the four high roofs abutting on the central tower are obvious means of attaining a stately result, and the church owes a good deal to its situation upon a low hillside sloping towards the north-west. Standing in the nave, it is almost impossible without actual measurement to realise the extremely small scale of everything. The total internal length is only 218ft.; width of nave and aisles, 45ft.; width across transept, 89ft. 6ins.

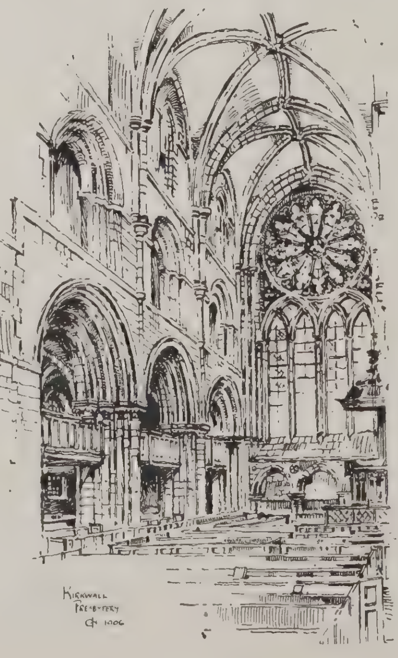
The clear width of nave is no more than 15ft. 2ins. at the east end, and of the choir 16ft. 6ins., while the average span of the lantern arches is only 13ft. 6ins.

The proportions are more lofty than is usual in Britain, the height to the apex of vaulting varying from 47ft. to 48ft., so that the nave is three spans high. Of this height, nearly one-half is given to the pier arcade in the nave, the triforium and clearstory stages being nearly equal.

The pier arches are rather lower in proportion in the choir, and the high vaults of the choir are higher than those of the nave.

Internally the effect of size is no doubt due to the mass and complexity of the support, the spans of the arches being generally less than double the diameters of the piers. And there is great irregularity throughout the building, which no doubt adds to the mystery and complexity of the interior. Moreover the vaulting of the choir drops perceptibly from west to east, and the pavement of the nave rises slightly in the same direction. It is not, however, suggested that there was any conscious attempt on the part of the builders to produce "architectural refinements," unless in the case of the choir vaulting, as the irregularities of the different parts are obviously to be explained by reasonable causes, such as the natural slope on which the church was built, and the leisurely fashion in which it was carried to completion.





Structurally the vaulting is of considerable interest; both the high vaults and those of the aisles are filled up almost to the apex level with solid rubble work, and in this respect they resemble Wren's vaulting at St. Paul's Cathedral. The vaults of the nave aisles, being pointed in section, rise above the triforium string, and there are, consequently, steps from this level in each arch of the triforium leading up to the platform over the aisle vaults.

It is possible that the triforia may have been intended for congregational use. All parts of the church are readily accessible at the various levels from a very complete system of passages reached from two wide newel staircases at the west angles of the transepts. There are four angle staircases in the belfry, which has double walls, is about 100ft. high to the parapet, and contains four bells, the tenor re-cast at Amsterdam in 1682, the second and third dated 1528, and a small bell known as the "skellat" bell. These bells are hung upon beams, and are chimed and not rung.

As for the repairs which were carried out between 1846 and 1856, it is only fair to say that they were effected, on the whole, in a very conservative spirit. The walling generally was, however, disfigured with a good deal of unsightly pointing in cement, and, since the Government restorations, the interior of the nave and transepts has also been scraped and pointed in a somewhat unsympathetic manner. But the condition of the church is a subject for thankfulness, and it is a building that is full of lessons which the wandering architect may read, mark, learn and inwardly digest.

CHARLES A. NICHOLSON.

The New Public Library at Parkhead, Glasgow, designed by Mr. James R. Rhind, has just been opened; also the Carnegie public library at Rutherglen, erected from designs by Messrs. George Sinclair, A.R.I.B.A., and John Ballantine, of Glasgow. The cost of each library has been about £7,000.

The Court of Session.—Plans are being prepared by the Board of Works for the proposed enlargement of the Outer House, or Court of Session, Edinburgh. Several years ago, when plans were submitted for the rebuilding of the entire law courts, involving an outlay of from £40,000 to £50,000, the Treasury objected to so large an expense, and at the time the proposals fell to the ground. Now, however, the question has been revived, and proposals of a more modest character are mooted. The present scheme includes the setting back of the building southwards, on the open space next the Cowgate, and the enlargement of the five courts of the Outer House, the provision of waiting and retiring rooms for witnesses, rooms for officials, and better accommodation for restaurant purposes. Mr. W. T. Oldrieve, principal architect to H.M. Office of Works, has prepared the plans.

Notes and News

Canonbury Tower is to be renovated.

Creed Parish Church has been re-opened after restoration.

The Architectural Association Annual Excursion took place last week, Stamford being the headquarters.

A Sewage Syphon is being built across the Manchester Ship Canal to carry sewage from the Frodsham and Helsby district.

Mr. Somers Clarke, F.S.A., it is stated, has resigned his appointment as architect to the Dean and Chapter of St. Paul's Cathedral.

The New Town Hall and Municipal Buildings at Cardiff, which have cost £300,000, are proposed to be opened on October 17th next.

New Public Swimming Baths at Goole have been erected at a cost of £3,300 from designs by Mr. E. H. Barber, the town surveyor.

American Architects for London.—Messrs. D. H. Burnham & Co., the well-known firm of architects of Chicago, have established an office in London.

A New Central Telephone Exchange at Birmingham is to be built in the vicinity of New Street Station. A London architect has prepared plans for the building.

A Parochial Hall is to be built in connection with St. Jude's Church, Shieldfield, Newcastle-on-Tyne. The architect is Mr. A. B. Plummer, F.R.I.B.A., of Newcastle.

A New Church at Preston is to be erected from designs by Mr. Lacy Ridge, the Diocesan architect. It will, when completed, seat 500 people, and the approximate cost will be £4,300.

The historic Castle of the Forest of Birse, near Aberdeen, which has been for many years in ruins, has now been restored to a habitable condition under the direction of Mr. G. Bennett Mitchell, architect, of Aberdeen.

Important Alteration in Princes Street, Edinburgh.—The Palace Hotel in Princes Street, Edinburgh, which was heightened and enlarged seventeen years ago, is to be converted into shops and business chambers. Messrs. Henry and Maclennan, of Edinburgh, are the architects.

Cost of Buildings in the U.S.A.—In the forty-seven principal cities of the United States, the total value of buildings erected during the year 1905 was £128,110,000. New York City alone erected buildings costing a total of £35,600,000, Brooklyn coming next with an expenditure of £15,000,000.

Huge New Premises for Messrs. W. H. Smith & Son are being erected in Kingsway, at the Aldwych end. There are ten floors, including basement, and the estimated cost of the building is £35,000. Messrs. Cubitt, Nichols, Sons & Chuter, of Howard Street, Strand, W.C., are the architects.

An Old Pine Roof.—The chancel roof of the historic parish church of St. Botolph at Boston, Lincs., was recently said to be in danger. Mr. W. S. Weatherly, F.R.I.B.A., the architect, reported that the roof is a pine one, that it has stood for over 500 years, and would have stood longer but for decay caused by worms. There was danger that the decay would spread. The corporation, who are responsible, have decided to proceed with the work of renovation, which will cost about £1,000.

Sanitary Fittings and Appliances for Italian Houses.—Our Consul at Naples reports that much more attention is being paid to the sanitation of houses in South Italy, and British manufacturers should find an opportunity for business in this direction, as it is incontestable that they have a pre-eminence in household fittings of the kind.

Electric Furnaces for Steel Production in Scotland.—A syndicate of London and Glasgow financiers will, it is said, apply in the next session of Parliament for powers to use the waters of Loch Awe, in the Western Highlands of Scotland, with a view to generating electricity. They propose to lay down electric furnaces for producing steel by a process hitherto unknown in this country. The intention is to carry the water for some miles to a power-house, from where the electric energy would be transmitted by overhead cables to the steel works to be erected at North Connel, on the western seaboard.

Holy Trinity Church, Hull, is stated to be in a dangerous structural condition. The foundations have settled, and as a result there has been what is called "flushing" or "flaking" going on in the arches, and the tower is gradually leaning more and more to the west and south. Mr. Fox, the well-known engineer, has been consulted, and also Messrs. Thompson & Sons, the builders, who have had much to do with the restoration and strengthening of cathedrals. Their united advice is that the matter has gone so far as to demand immediate attention. It is expected the cost of repair will be between £4,000 and £5,000.

A Greek Church for Cardiff is to be erected from designs by Messrs. James and Morgan, FF.R.I.B.A., of Cardiff. It is designed in Byzantine style, the plan being that of a Greek cross. The portion first to be built comprises the nave, narthex (with gallery over) and sanctuary. Future extensions will include the north and south transepts. The centre portion of the nave will be covered by a large copper dome 28ft. in diameter, from which light will be obtained through sixteen windows. The roof of the sanctuary is also covered by a copper dome. The elevations will be in red brick and Bath stone dressings. The cost is estimated at about £2,000. Messrs. Knox and Wells, of Cardiff, are the contractors.

A New Church at Ellel is being erected from designs by Messrs. Austin & Paley, of Lancaster, at an estimated cost of £6,000. The church is in the late Decorated style, and consists on plan of a nave of six bays 72ft. long by 21ft. wide, the north aisle extending the same length 11ft. wide. Four large circular piers, 4ft. 10ins. in diameter, will carry a tower and spire, at the crossing. The roofs will be open timbered with plastered ceilings. The nave and chancel are to be covered with red tiles, and the aisle roof with lead. The church will be built of local stone for walling and Darley Dale stone for dressings, inside and out. The work is being carried out by the following local firms:—Masonry, Arthur O. Thoms; carpentry and joinery, James Hatch & Sons; tiling, R. Hall & Sons; plumbing and glazing, Rushton & Pinch.

The Borough Theatre, Stratford, has been re-decorated and overhauled in every particular. The scheme of decoration is rich and harmonious, the prevailing tints being cream and salmon relieved by gold, the whole set off against the crimson paper on the walls and the deep copper-coloured draperies. The seating has been re-upholstered, and the building entirely re-carpeted. The electric installation has also been improved, and all woodwork and stonework re-painted and restored, so that the theatre has the appearance of a new building. The work has been carried out by the well-known firm of Messrs. F. De Jong & Co., of Camden Town, under the personal direction of Mr. Hillier Pyke, architect to the proprietress.

Obituary.

The late Mr. W. H. Attwood, builder, of Polegate, Sussex, died worth £29,147.

The late Mr. John Wills, architect, of Derby, left estate which has been proved at £15,975 gross.

Mr. T. Barnes-Williams, F.R.I.B.A., F.S.I., senior partner in the firm of Barnes-Williams, Ford & Griffin, architects and surveyors, of London, E.C., died recently, aged 59.

Law Cases.

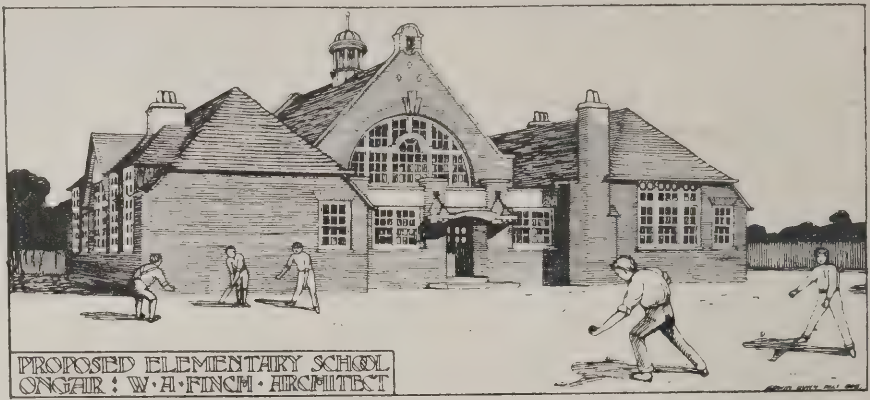
Appeal Case under the Amended Building Act: London County Council Defeated.—On Wednesday last at the Surveyors' Institution was heard the first appeal to the Tribunal of Appeal under the London Building Act (Amendment) Act, 1905, which now affects new buildings only, but from January 1st next will be retrospective. The case in question arose out of the refusal of the Council to pass the plans prepared by Mr. Percy B. Tubbs, F.R.I.B.A., for a building in course of erection in Leather Lane. The building is to be of fireproof construction, with steel and concrete floors and brick-enclosed staircase of L.C.C. pattern. The Council insisted on (1) the placing of clear, fire-resisting glass in the teak doors of the building, (2) the provision of doors to shut off the basement stairs, and (3) the placing of a smoke-check lobby, ventilated into the open air, with double doors leading out of every room. The building having only one room of 25ft. by 24ft. on each floor, the Tribunal of Appeal decided that the requirements of the London County Council were unreasonable, and decided in favour of Mr. Tubbs, with fifty guineas costs.

Workmen's Compensation.—In the Liverpool Nisi Prius Court recently the case of *Marsh & Fretwell v. Coulthurst* was decided. The plaintiffs were Messrs. Marsh & Fretwell, joiners and builders, carrying on business at Darwen, and the defendants Messrs. H. J. & A. Coulthurst, ironwork contractors, also of Darwen. The action was brought to recover moneys paid to a claimant under the Workmen's Compensation Act. In August the plaintiffs were erecting a mill near Darwen, and the defendants were carrying out the erection of the ironwork. A man named Duckworth, employed by the plaintiffs, was injured by the fall of a derrick belonging to the defendants, and the injuries terminated fatally. In the first instance, Duckworth himself brought a claim under the Workmen's Compensation Act against the plaintiffs, and obtained an award; and after his death his widow obtained further compensation from the plaintiffs. Contending that the defendants were in fact the responsible parties, the plaintiffs sought to recover the moneys so paid. For the defendants counsel argued that, as subcontractors, the defendants could not be held reponsible. Mr. Justice Bray said that the defendants owed a duty to the workmen engaged on the building to take all proper precaution to prevent accident. The cases cited by counsel, in his opinion, did not fully apply to this case, and therefore he found for the plaintiffs, with costs, for £165. A stay of execution was granted on the usual terms.

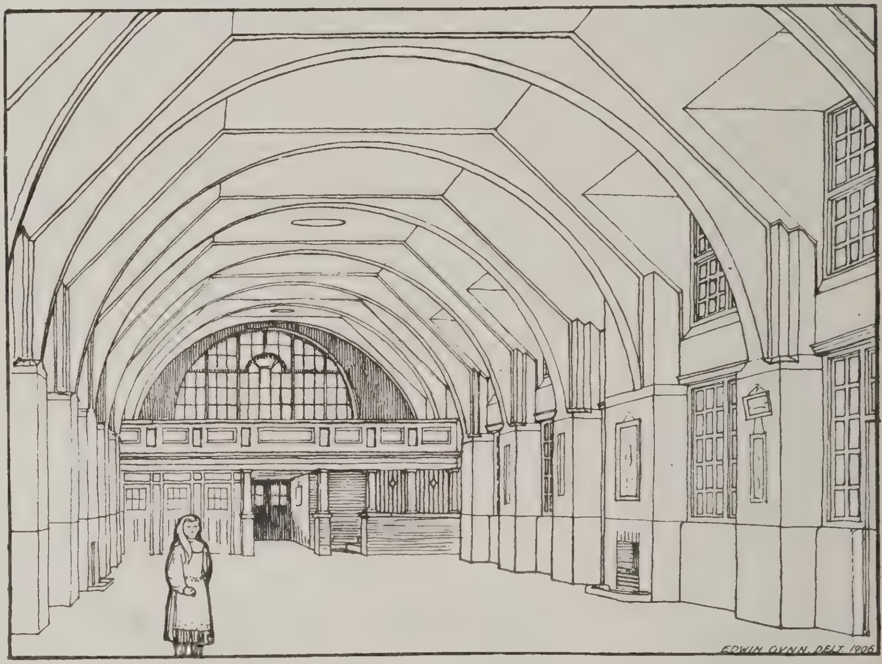
Builders and Architects' Certificates.—The case of *Chapman v. Burley*, heard first at the Leicester Assizes, was recently decided in the King's Bench Division of the High Court of Justice. The action was brought by Mr. James Chapman, builder, against John Henry Burley, of Leicester, to recover £475, alleged to be due under a contract. In March, 1903, the plaintiff agreed to erect five shops in Leicester for the defendant for £3,990, and an architect was appointed by the defendant. The plaintiff only executed bricklaying work, and left the architect to make arrangements for the other part. According to the terms of the contract, the plaintiff was not entitled to call on the building owner for a payment on account until the value of the work executed amounted to £650. Before this amount of work had been done, and without any request from the plaintiff, the architect certified that the sum of £500 was due to the plaintiff, and the defendant made out a cheque for the amount, payable to the plaintiff, and handed it to the architect. This cheque never reached the plaintiff, whose signature was forged both in the case of the cheque and the receipt attached to the architect's certificate. Other sums were obtained from the defendant in a similar way. The result was that the defendant had in fact paid his architect for the whole of the work upon certain certificates given by him and by cheques which never reached the plaintiff. The plaintiff and the sub-contractors had received £2,691, and the action was brought for a balance of £475. The question was whether the plaintiff was bound by the payments which had been made by the defendant to the architect. Under the contract the architect was not the agent of the plaintiff to receive payment. Mr. Justice Walton said he could see no reason for throwing the loss on the plaintiff, and therefore he held that the money had not been paid, and the plaintiff was entitled to sue for whatever was properly due.

SCHOOL AT CHIPPING ONGAR.

This building is being erected by the Guardians of the Hackney Union for the education of the children to be placed in their cottage homes recently erected on adjoining land, for whom the accommodation of the town schools is inadequate. The school is designed for 300 children, with a possible extension for an additional 120, the hall and cloak-rooms being sufficient for the larger number. Mixed classes are contemplated. The work is plain and substantial, and in detail follows closely the other buildings on the site. The builders are Messrs. F. & E. Davey, Ltd., of Southend-on-Sea, and the architect is Mr. W. A. Finch, of 76, Finsbury Pavement, E.C.



PROPOSED ELEMENTARY SCHOOL
ONGAR : W·A·FINCH · ARCHITECT



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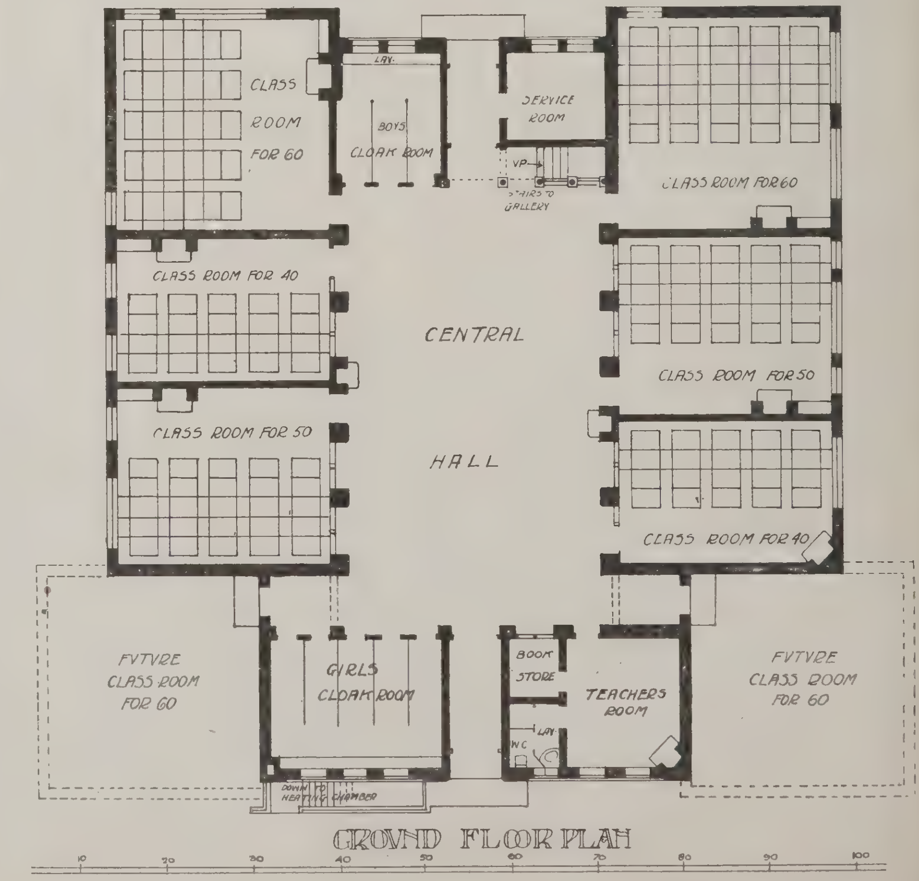
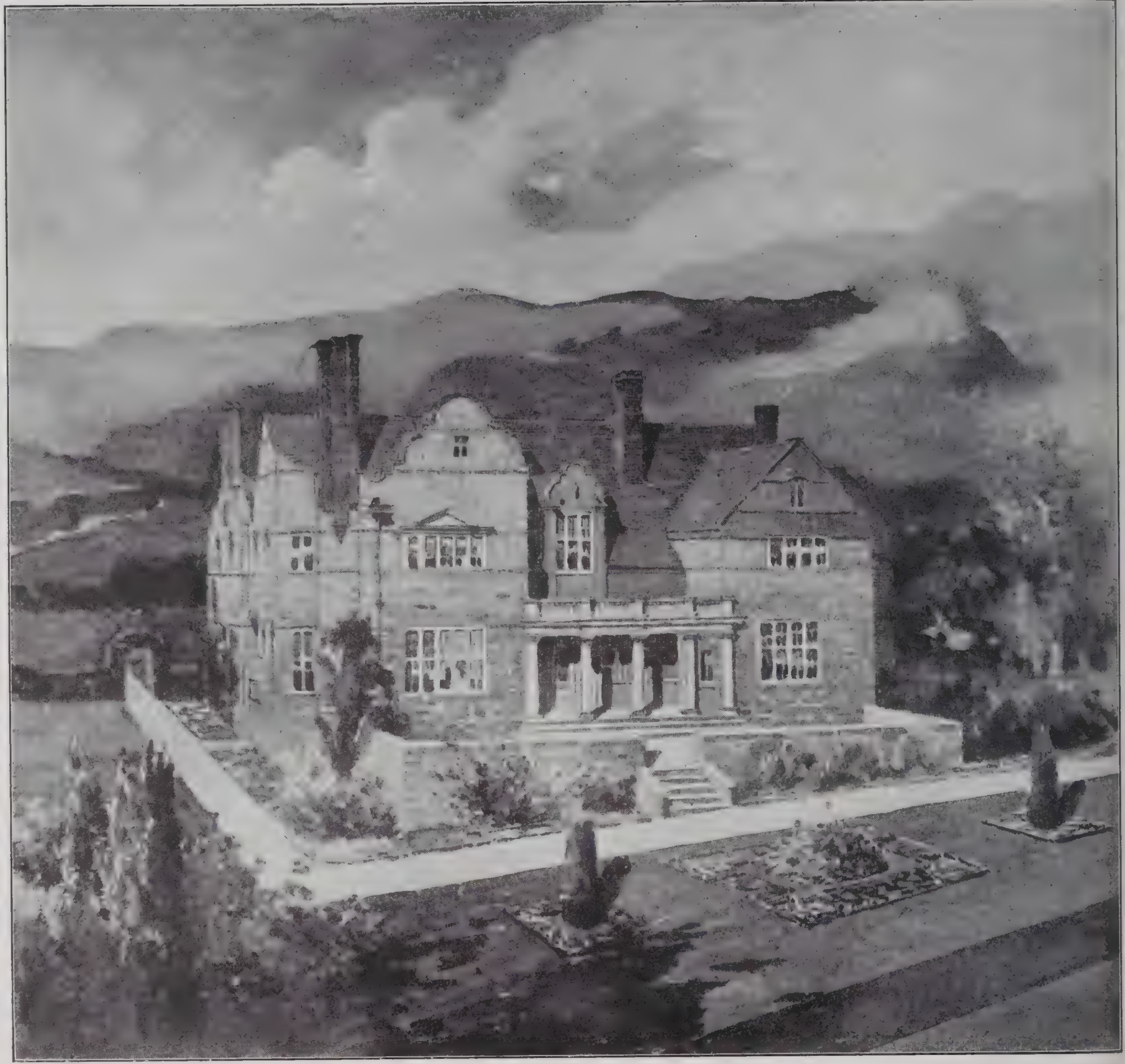


GROUND FLOOR PLAN

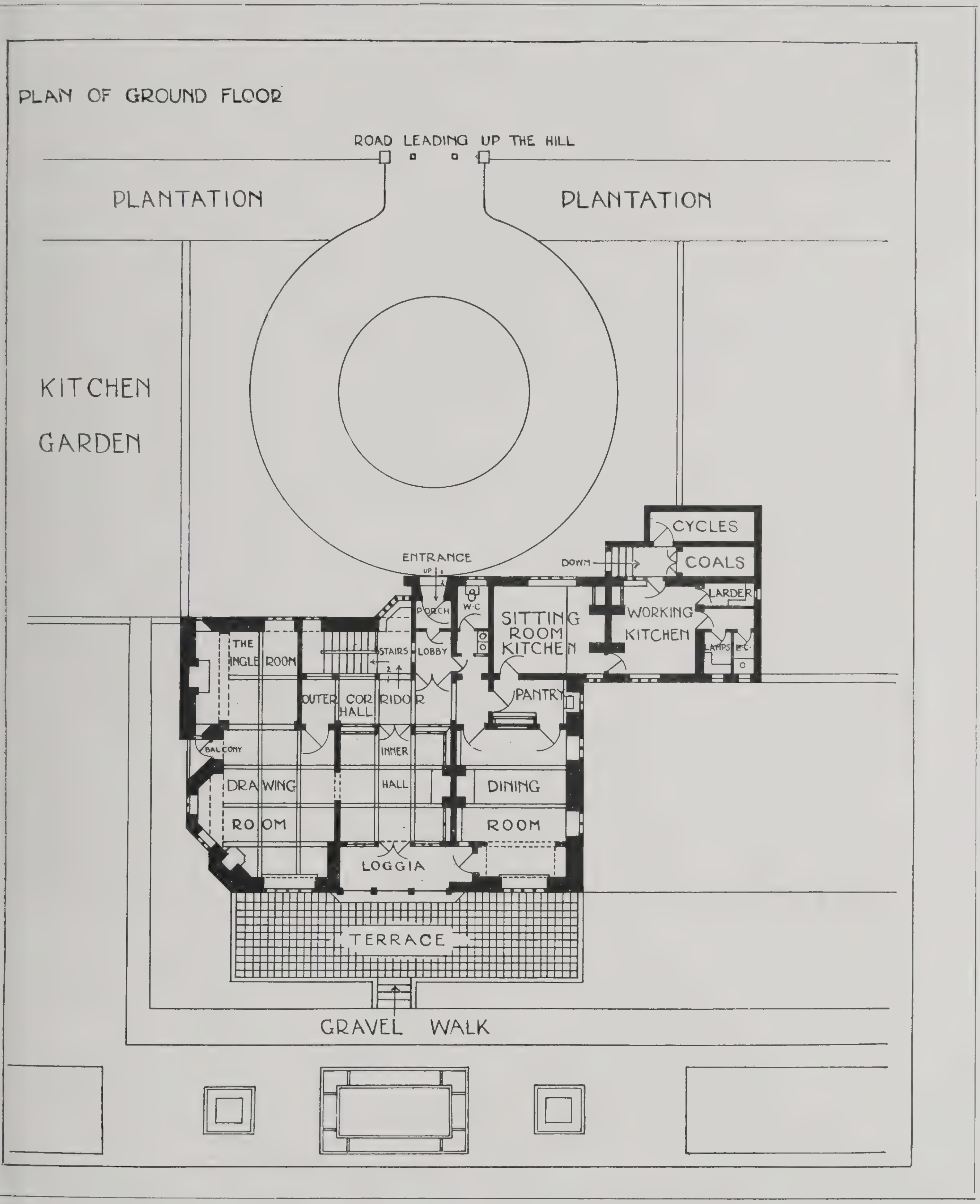
LIBRARY
OF THE
UNIVERSITY OF ILLINOIS

Supplement to
THE BUILDERS' JOURNAL AND ARCHITECTURAL ENGINEER,
Wednesday, August 22nd, 1906.



HOUSE ON THE DOWNS, LYMINGE, HANTS. ARTHUR T. BOLTON, A.R.I.B.A., ARCHITECT.

The site for this house is about 500ft. above sea level, and very exposed. The walls are accordingly designed 2ft. thick on the principal fronts and built, with a hollow space, of Kentish rag and brick inside lining. Parts of the house are hung with local tiles as a weather covering, the brick walls being built hollow up to the first floor. The site is chalk close to the surface, and has a considerable fall. The excavated chalk forms the filling-in of the terrace, which is faced with Kentish rag rubble walling. By reason of the splendid view from the garden front, a recessed verandah, or portico, with columns and entablature of wood, forms a feature of this side of the house. It is arranged with a flat terrace roof, accessible from the first-floor bedrooms by steps. The hall receives a clearstory light on account of the collection to be displayed in the cases forming part of the internal fittings, as marked on the plan in between the pillars of the screen to the outer hall, and in the side recesses. The plan is laid out to suit the special ideas of the owner. The reception-rooms are larger than is usual and there are fewer bedrooms, but they are of good size. It was proposed to have two bathrooms. The cost is estimated at £3,000, on the basis of 9d. per foot cube.


PLAN OF GROUND FLOOR
ROAD LEADING UP THE HILL
PLANTATION
PLANTATION
KITCHEN GARDEN
CYCLES
COALS
DOWN
ENTRANCE
UP
PORCH
W.C
SITTING ROOM KITCHEN
WORKING KITCHEN
LARDER
LAMPS
E.C.
THE INGLE ROOM
STAIRS
LOBBY
OUTER CORRIDOR HALL
PANTRY
BALCONY
INNER HALL
DRAWING ROOM
DINING ROOM
LOGGIA
TERRACE
GRAVEL WALK

Enquiries Answered.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional, or legal matters.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication

R.I.B.A. Examinations.

ABERDARE. — SET SQUARE writes: "Which of your issues contain answers to questions set in the past R.I.B.A. Intermediate and Final Examinations?"

Model answers to questions set in the Intermediate Examination this year were published in our issues for July 11th, July 25th, and August 8th, and answers to the questions set in the Final Examination are in hand, and will be published as soon as possible. Answers to questions set in 1899 will be found in Vol. X.

Model By-Laws.

LEE.—SUBSCRIBER writes: "Where can I get a book on the model by-laws as required by district councils?"

"Knight's Annotated Model By-laws," price 16s. post free, from our offices.

Municipal Architectural Work.

DUNDEE.—SUBSCRIBER writes: "Having had six years of architectural training, I am desirous of qualifying for municipal work, and intend taking the examination held for sanitary engineers. Do you consider this to be of any advantage?"

You do not state exactly what examination you propose to go in for. There is that of the Royal Sanitary Institute and that of the Institution of Sanitary Engineers, either of which would be advantageous to you. But the best certificate would be that of the Association of Municipal and County Engineers. Apply to the secretary, Association of Municipal and County Engineers, Victoria Street, S.W.

FAREHAM.—A. S. writes: "I am 24 years of age, and am at present an assistant in a civil engineer's office, having been two years as such, and served five years as articled pupil. I am now desirous of entering a municipal office. I have passed the examination of the Incorporated Association of Municipal and County Engineers, and I now wish to know whether, with the certificate of the Royal Sanitary Institute, I should be in a better position to obtain an appointment in a municipal office, or would the other certificate be sufficient to testify as to my knowledge in sanitary science?"

You do not say which examination of the Municipal and County Engineers you have passed, whether the Graduates' or Associates' examination. With your other experience the Graduates' should be quite sufficient to secure for you an assistant's post with a municipal engineer, and the Associates' examination would be sufficient to get you one of the minor engineerships for a district council, &c. The Royal Sanitary Institute certificate would be of value in addition. As you have spent so much time in a civil engineer's office, it would be well for you to enter for the sanitary science branch of the examination, but you must not forget that the minor engineers' posts are often associated with sanitary inspection, so that a knowledge of sanitary inspectors' duties might therefore be advantageous to you.

Mr. Henman's Ventilator.

CROYDON.—INLET writes: "Where can I get particulars and prices of an automatic regulator for inlet ventilators devised by Mr. Henman, and mentioned by him in a paper on Ventilation read before the Architectural Association on November 11th, 1904."

Mr. Henman's paper was published in our issue for November 16th, 1904, and in that issue were given some illustrations and particulars of the automatic regulator devised by him (it is made by Messrs. Hart, Son, Peard & Co., Ltd., of 138-140, Charing Cross Road, W.C.). The regulator consists of a metal hopper with curved back in which a flap is hung on leather hinges, so as to prevent any clicking noise. This flap remains stationary in calm weather, allowing 3½ins. of space for the inlet of air, but in windy weather the flap is deflected and the area of the inlet proportionately reduced, thus automatically securing a uniform supply of air.

Claim for Damage done to Drawings.

LONDON.—R. N. writes: "In competition I prepared mounted designs of a public building for a municipal body, which were delivered personally under brown paper covering only. These were eventually returned to me, through carriers, without any cover, with a big hole through them, done in transit. Have I any legal claim, and against whom? The carriers inform me they cannot entertain any claim, as they were valuable drawings and should have been packed properly for delivery through their agency."

You should apply to the promoters of the competition for compensation for the damage done to your drawings, but it is doubtful if they will accept any responsibility; and, unless there was an undertaking to this effect, we doubt if you could obtain redress.

Civil Engineering for Architecture.

LONDON.—W. A. B. writes: "A student who has lately completed his pupilage under an architect wishes to change his profession to that of a civil engineer. How would you advise him to set about doing so? Is it possible for him to become a member of the Institution of Civil Engineers without being re-articled to a corporate member of that profession and, consequently, paying another premium?"

It is possible to become an associate member of the Institution of Civil Engineers by passing their open examination. You will need to go in for an extended course of study, both practical and theoretical. We would advise you to obtain instruction at the best engineering school you can conveniently reach, and to apply for a situation (however small and unremunerative it may seem) with an engineering firm, advertisements of which constantly appear in the engineering papers. You might also advertise for a situation in the same journals.

Examination for A.M.I.C.E.

DUBLIN.—J. F. writes: "Where can I get particulars of examinations for the A.M.I.C.E. degree?"

Particulars of the examinations held by the Institution of Civil Engineers may be obtained from the secretary of the Institution, Great George Street, Westminster.

Becoming an Instructor in Building Construction.

EAST HAM.—H. J. writes: "What examinations must I pass in order to become a teacher of building construction?"

There are special examinations that teachers of building construction are forced to pass, but undoubtedly applicants for such posts have not much chance of being selected unless they have passed well-recognised examinations such as those of South Kensington, the Royal Institute of British Architects, or the Surveyors' Institution.

Algebra for R.I.B.A. Intermediate Examination.

LYTHAM.—I. W. T. writes: "Is it necessary to know algebra for the Intermediate Examination of the R.I.B.A.? If so, how far do you consider it necessary to go?"

You certainly need to have a knowledge of elementary algebra for this examination, but we think it sufficient if you study the subject as far as the solution of quadratic equations. We strongly advise you, however, to study the subject much more thoroughly than this, as you would find it of invaluable service in the practice of architecture.

Architects' Assistants for Canada.

HEATON MOOR.—S.E.B. writes: "What chance is there of employment in Canada as architectural assistant, and in what towns?"

There are undoubtedly good prospects for employment of architects' assistants in Canada. The older settled portions, however, do not offer such good opportunities as the towns in the North-West, which are growing rapidly. In our opinion, no one should settle upon any definite course when going out to Canada. They should possess sufficient to keep them for some months, and so be able to investigate conditions on the spot. Therefore we do not care to suggest any particular towns, as there are undoubtedly opportunities continually occurring in the smaller districts and whereever Government posts are established. Our latest information is that Winnipeg, Regina and Edmonton are towns where there are openings. You will find further information in replies to enquiries in our issues for May 9th and June 13th.

Stone Slates: Buildings near Banbury.

Referring to the replies to enquiries under the above heads on p. 83 of our issue for last week, E.G. writes: "If B.P. requires stone slates he need not go so far afield as Stow-on-the-Wold (which is in the north of Gloucestershire, not in Somersetshire, as stated). They can be obtained within 20 miles of Woking—at Horsham, Sussex, and as with such work it is not merely a question of obtaining slates, but *slaters*, this should be an advantage. With regard to Banbury, Compton Wynyates appears to have been unaccountably overlooked, and I think Bloxham, Adderbury and King's Sutton churches were also worthy of mention. The Globe Room at the Reindeer Inn in Banbury may be particularised as a sumptuous example of Jacobean work."

A Fortnight's Tour in England.

IGEL writes: "Kindly give me some hints for a fortnight's holiday in England. My requirements are, a pleasant locality and good sketching material—Renaissance for preference. My own idea is Norfolk and Lincolnshire."

Opinions as to the best sketching ground in England are bound to differ very considerably, but there are few districts in England which can compare with the Nene Valley as a veritable happy hunting-ground for the student of architecture. This district contains some of the finest churches in England, such as Higham Ferrers, Raunds, Woodford, Denford, Strixton, Stanwick, Hargrave, Kingstad and Rushden, as well as some of the finest Renaissance buildings, amongst which is Wollaton Hall. You should refer to Mr. J. Alfred Gotch's "Architecture of the Renaissance in England," in which you will find many fine examples from the district mentioned. Both Lincolnshire and Norfolk are very rich in Gothic work, but the Renaissance examples are few and far between, and as your tour is confined to a fortnight, you would do much better to go to the Nene Valley, where the distances from one fine building to another are remarkably short.

H. Y. M.

District Surveyor's Fee.

WIMBLEDON.—L. D. writes: "A portion of the drainage to a house with four floors including basement (less than 400ft. super. in area) has been reconstructed. What fee is the district surveyor entitled to? No alterations to the building have been carried out."

I am of opinion the correct fee for the district surveyor would be £1 (see schedule III., Part 1, of the London Building Act, 1894.)

F. S. I.

Council's Refusal of Plans.

H.O.C. writes: "The accompanying plan (not reproduced) shows, in red, four cottages which it was proposed to build on a site indicated in green. The plans were submitted to the town council, who refused to sanction them, on the ground that the erection of the cottages would be the commencement of a new street. As the owner of the site coloured green does not own any of the surrounding property, and has no intention of constructing a street, do you consider the council's objection is a valid one? The plans of the houses and the air-spaces both in front and rear are in accordance with the by-laws (a copy of which is sent)."

Your drawings appear to be quite in accordance with the by-laws of which you send a copy, and you appear to have allotted a sufficient air-space to meet the requirements of by-law 29. I am aware of no provision in the "Public Health Acts" which enables the sanitary authority to refuse these plans, and I am of opinion that they are exceeding their legal power in so doing. In many towns rows of houses may be found arranged exactly as in this case (*e.g.*, Leicester, where they are locally known as "avenues"). You would, I think, be well advised to press these plans upon the authority, as, I believe, a mandamus could readily be obtained to compel them to accept them as presented. F.S.I.

The Rebuilding of San Francisco seems to be making great progress, though the supply of labour is stated to be very short. During July 470 permits were issued for buildings of a total value of £702,800, 66 permanent buildings were under construction, 4,500 temporary buildings, and 25,000 men engaged on the works; 100 carts of *debris* were being removed daily.

Notes on Competitions

The North of England continues to hold top place for competitions which leave something to be desired. The most recent instances are from Yorkshire and Durham, and both are marked by the spirit of parsimony which has for its end the saving of money at the expense of the architect.

High School for Girls, Barnsley.

In this competition applications are to be made by architects, stating particulars of secondary schools built from applicants' designs; success of applicant in similar competitions; the amount of commission (stated as a percentage on the amount for which the contracts are let) the competitor will be prepared to accept in the event of his plans being accepted. It is proposed to select from the applicants a limited number of competitors who will be asked to submit plans. Now, this is simply laying a competition open to the lowest bidder, and, other things being equal, the lowest bidder will be, no doubt, the one entrusted to carry out the work. This is a regrettable state of affairs, and one which other professions would find a means to remedy. It has been pointed out to the Governors of the school that the scale of charges recognised by the Royal Institute of British Architects should be adopted, in the interests both of the competitors and of the promoters; of the former because the best efforts of the selected competitor ought to be met by reasonable compensation; of the latter because the selection only of such architects as are willing to accept terms below the customary rates will exclude the very men it would have been most desirable to have had compete. No reply to these arguments has yet been received. It is to be hoped the Governors are not being encouraged by the applications of architects in the North.

Cottage Homes, Cleadon, South Shields.

Here again the remuneration clause has an ugly look, although, it must be admitted, fears as to fees are the result of a knowledge of Northern methods. The conditions state that "the architect whose plan is selected by the guardians will be employed to carry out the work (upon terms to be arranged)." This statement is too ambiguous to be accepted without further enquiry by intending competitors—that is, if anybody proposes to be rash enough to become a competitor under a condition which leaves the question of assessing by an expert an open one. To quote clause 2 of the conditions, "The guardians may themselves select the plans which, in their judgment, will best meet their needs, but they reserve to themselves the right of calling in a technical adviser, and in any case their decision shall be final and binding upon all competitors." So, even if the guardians avail themselves of the option of calling in a technical adviser, there is no guarantee that they will abide by his selection. Furthermore, a "technical adviser" might mean anything from a jerry builder to the President of the Local Government Board. The conditions are dated August 11th, 1906, and the plans, &c., are to be delivered by September 11th next. This is insufficient time for the mature consideration of schemes and the preparation of designs for five pairs of semi-detached cottage homes two or three storeys high, an administrative block including accommodation for twelve children, a receiving home with accommodation for thirty children, &c., and a report and estimate. This competition has one favourable feature. No deposit is required for the conditions, but the conditions are unaccompanied by a site plan. The site plan is to be obtained by payment of one guinea, which sum is returnable to all who send in designs. Competitors are able thus to ascertain the nature of the competition before committing themselves to a deposit, which, in ordinary circumstances, they are often unable to get returned. It is not unreasonable to expect that a site plan obtained in this way would be accurate. The guardians, however, will accept no responsibility in the matter, but leave architects to satisfy themselves as to the accuracy of the plan and any figures thereon.

In this instance, as in the former, representations have been made by the Competition Reform Society, to the promoters, with the object of obtaining a revision of the conditions. May their efforts be crowned by the success which has attended several recent actions having for their aim the same desirable end.

Carnegie Libraries, Dundee.

A deputation of Dundee architects is to wait upon the Town Council to request that competitive designs be invited for the two new branch libraries to be erected there. Such a course is stated to have the approval of Mr. Carnegie, the donor of the money. Hitherto such work has been done by the City architect.

List of Competitions Open.

DATE OF DELIVERY	COMPETITION.
—	PREMISES FOR LEVEN REFORM CO-OPERATIVE SOCIETY, LTD. Particulars from D. C. Wilson, sec.
Aug. 31	HIGH SCHOOL FOR GIRLS AT BARNSLEY. Applications by this date to W, P. Donald, clerk to the Governors, Education Office, Barnsley. Premiums of £100, £50 and £20.
Sept. 3	NEW SECONDARY SCHOOL AT MEXBOROUGH, ROTHERHAM. Limited to architects practising within 35 miles of Mexborough. Particulars from J. W, Hattersley, Secretary to Governors of School, Mexborough.
Sept. 6	LABOURER'S COTTAGE AT GALWAY to cost £80. Premium £5. Particulars from J. Redington, secretary, Urban District Council, Galway. (See advt. on p. xxiii. of this issue.)
Sept. 11	COTTAGE HOMES AT CLEADON and receiving house at workhouse, for Guardians of South Shields Union. Particulars from J. W. Coulson, Union Offices, South Shields.
Sept. 20	SCHOOL AT SUNDERLAND. Limited to local architects. Premiums of £50, £20 and £10. Particulars from John W. Moncur, borough engineer, Town Hall, Sunderland.
Sept. 21	CONVALESCENT & NURSES' HOME AT GLOSSOP. Premiums of £20 & £10. Particulars from Mr. T. W. Ellison, Town Clerk, Norfolk Chambers, Glossop.
Sept. 28	SEWAGE DISPOSAL SCHEME FOR ELLESMERE. Premium of £20. Particulars from R. E. Lloyd, clerk to Urban District Council, Ellesmere.
Sept. 29	REBUILDING OF HENSHAW'S BLIND ASYLUM AT MANCHESTER. Limited to Manchester architects. Premiums £100, £50 and £25. Assessor, Mr. John Holden, F.R.I.B.A.
Oct. 1	ALPHABET COMPETITION. Prizes of £20, £10 and £5. For particulars see "Architectural Review."
Oct. 31	BOURSE AT CAIRO.—Premiums of £E250 and £E100. International competition. Designs to be submitted to the "Corporation des Agents de Change," Cairo, Egypt.
Dec. 14	FOUNDLING HOSPITAL, MONTEVIDEO.—Four selected designs in preliminary competition to be awarded £212 each; first premium of £742 in final competition. Particulars from Consulate-General for Uruguay, 5 & 6, Clement's Inn, London, W.C.

Correspondence.

The London County Council Hall.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—I write as I think it mischievous that letters such as Mr. Bonner's should remain unchallenged, however little those who know anything about the subject may consider them to be worth.

Many errors occur in competitive awards, and many mistakes have been made in the selection of competitors for limited competitions, but I am not aware that there is a single case where the Council of the Institute could be accused of perpetrating a job as Mr. Bonner seems to suggest.

Personally, I believe that limited competitions are usually a mistake—that if one is to have competition at all it should be quite open, because one never knows whether an absolutely unknown man may not in any given case produce the best design, and because circumstances tend to help the man whose reputation is made more than the man who has yet to make his reputation. Mr. Bonner does not seem to remember that most competitions are international, and I think reasonably so. If a foreigner can (in spite of the disadvantage he suffers by his greater difficulty in arriving at what is wanted) win an English competition, I think it is best for everyone that he should do so. Let London have the best that the whole world can give: the odds are that it will prove to be an English design.

I should certainly think it more satisfactory all round if the nominated architects had to compete in both competitions, but Mr. Bonner knows perfectly well when a second competition is instituted that none but the assessors (and perhaps a committee) see the designs first submitted. It is a deliberately unworthy attempt to prejudice the issue to suggest that any unfairness is probable in such a case.

The proposed method of assessing is, in my opinion, satisfactory, and I am glad to see it as a recognition of what I believe to be the best method of settling competitions—the adoption of the jury system.

I would, in conclusion, suggest that Mr. Bonner should consider the inner meaning of the saying: *Honi soit qui mal y pense.*—Yours truly,

LONDON. HERBERT W. WILLS.

Standard Colour Card Competition.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—We would avail ourselves of your columns to thank the very large number of painters, decorators, architects, surveyors and other colour experts who have so well supported and assisted us in our endeavour to establish a universally recognised Colour Standard.

We are glad to be able to say that the vast majority of those engaged in the above professions have entered the competition, and have so become personally responsible for the resulting Standard Colour Card, which will, as a consequence, be thoroughly representative of colour ideas in this country.

It will take some time to arrive at the result, because it entails the careful examination of many thousands of specimens. In due course, however, we will issue copies of the Standard Colour Card to all those who have so kindly assisted us to this end.—Yours truly,

PINCHIN, JOHNSON & CO., LTD.
23-25 BILLITER STREET, E.C.

ARCHITECTURAL DEGREES.

The London B.A.

There has recently been instituted by the Senate of London University a course, extending over three years, leading to the degree of B.A. (honours in architecture). This course provides the opportunity, which has long been needed in London, by which architectural students can continue their general studies at the same time as they are commencing their professional work. A sound general education is now more than ever a necessity for architects, owing to the increasing number of practical subjects with which they require to be acquainted. The course also brings architectural students into touch with students in other departments of the College, who are pursuing different branches of work.

The Royal Institute of British Architects exempt from their Intermediate examination students who receive a first-class certificate of the College.

Students matriculating in September can enter on their courses in October.

A detailed prospectus of the school (which is under the direction of Professor Simpson, with Mr. Reginald Blomfield and Mr. Leonard Stokes as visitors) can be had on application to the secretary, University College, London.

Liverpool School of Architecture.

A syllabus of the School of Architecture at the University of Liverpool for the session 1906-7 has recently been issued. The school is under the direction of Professor C. H. Reilly, M.A., A.R.I.B.A., Mr. B. M. Ward, A.R.I.B.A., being lecturer on Architecture, Mr. G. Gilbert Scott reader on Ecclesiastical Architecture, Mr. C. J. Allen (Liverpool School of Art) instructor in Modelling; Prof. R. J. Harvey Gibson, M.A., and Mr. F. J. Lewis, B.Sc., instructors on Diseases of Timber; and Mr. H. J. Whitby, A.R.San.I., demonstrator on Building Materials. The next term begins on October 9th.

The school is one of those recognised by the Board of Architectural Education, and its courses meet all the requirements of the scheme propounded by the Board; indeed, in some ways this school may be said to have anticipated by more than ten years the scheme advocated by the Board. The school is terminally inspected by visitors representing the Board; the inspectors appointed being Mr. John Slater and Mr. Mervyn Macartney. Students who obtain a degree in the school or a first-class certificate are exempted by the Royal Institute from the Intermediate examination for Associateship. The Royal Academy also exempts such students from probationary work before entering their School of Architecture (the next term at which begins on October 1st).

The degree at present awarded is the degree of B.A. in the Honours School of Architecture, but there is under consideration a revised scheme of degrees.

Architectural Association School.

The next term at the Architectural Association School of Architecture commences October 1st, ending December 22nd. This is a very excellent school, conducted on most efficient lines. Mr. H. P. G. Maule, F.R.I.B.A., is the master. There is a day school and an evening school, full particulars of each of which are given in the syllabus to be obtained from the offices of the Association, 18, Tufton Street, Westminster.

Trade and Craft.

Enamels.

"Japanol" is one of the well-known enamels which are now so extensively coming into use and supplanting in great part the old paints so dearly beloved by the journeyman painter or the local decorator. The improper mixture of paint by people who know nothing about the chemistry of the subject naturally leads continually to trouble, and it may therefore be considered a distinct advance to be able to obtain paints ready mixed, supplied by reputable manufacturers, so that uniform and satisfactory results may be expected. "Japanol" requires no varnish, and it is supplied ready for use without any admixture of turps being required—in fact, turps should not be added. "Japanol" is applied in the same manner as ordinary paint after suitable priming. It is claimed that one coat is equal to three of ordinary paint and varnish. "Japanol" is suitable for outside and inside work, and it has no tendency to blister or crack. There is an immense number of shades in which it is supplied, and any special shade can be obtained if desired at short notice. Ten prize medals and diplomas have been awarded to "Japanol," so that it can be relied upon as an excellent preparation. The Cheap Wood Co., of Deptford Green, London, S.E., who supply "Japanol," also make a speciality of high-class varnishes, japans, dryers, paints and colours.

Glazed Bricks.

Messrs. Stanley Bros., Ltd., of Nuneaton, have recently issued a small pamphlet giving particulars of a few of the latest important contracts where their glazed bricks have been used. The buildings mentioned show that this firm's bricks are favoured by the leading architects and contractors of to-day, and those who have experience of the firm's productions will, we are sure, readily admit their uniformity of excellence in respect of richness of colour and evenness of glaze. The manufacture of glazed bricks is difficult, as shown by the fact that there are very few reliable glazed bricks on the market. In the glazed-brick trade it seems that the very cheap are necessarily nasty. Although this firm is chiefly known for its glazed bricks, it also specialises in semi-encaustic paving tiles, ornamental ridges and finials, red and buff chimney pots, glazed socket pipes, Staffordshire quarries, roofing-tiles, &c.

Drawing Instruments, Materials, &c.

We have just received a copy of a new catalogue of drawing and surveying materials, &c., from the well-known drawing office stationers, Messrs. Norton & Gregory, Ltd., of Castle Lane, Buckingham Gate, London, S.W. This embodies one or two special features. It is divided into sections which are easily turned up, so that any item required can be more or less located without reference to the index: and the strong binding is quite exceptional. In the matter of drawing instruments it is one of the greatest mistakes to put up with anything but the best quality. The loss of time, annoyance, and spoilt work caused by inferior instruments is familiar to everyone who has to make use of them extensively. Messrs. Norton & Gregory bring to this subject a wide experience, and anyone wishing to acquire sets of instruments suitable for all purposes likely to be generally required could not do better than consult specialists such as this firm. We know that it is often considered by those who have to use instruments that they are better judges than the firms who sell them, but this is a mistake. The specialists not only have experience, but they also receive suggestions and criticism from very many users, so that they are far better able to appreciate the good points than the individual user. It is, therefore, important that purchasers should go to those who have the reputation for supplying good instruments.

Watertight Flat Roofs.

In the past, of course, it was a distinctive feature of English architecture and of the architecture of northern countries that the roofs were pointed in order to secure watertightness, but modern architecture makes increasing use of the flat roof, the advantages of which are obvious. English Renaissance, too, calls for the flat roof. The use of mansards behind the parapets, besides being expensive, always seems somewhat incongruous and leads to the adoption of expedients which are a constant source of trouble and annoyance. Of course, with a flat roof there is the difficulty of making it watertight, but this difficulty has now been successfully overcome, and such roofs can be made perfectly satisfactory in this respect. Vulcanite roofing is one of the forms extensively adopted to-day. Its great advantage is that the prime cost is even less than for slated or tiled roofs, and it requires little or no repairs. It is not affected by climatic influences, and has been used in very many countries where extremes of heat and cold are experienced. The temperature under Vulcanite roofing is equable. The material which forms the waterproof surface is a bituminous, horn-like and elastic substance. This material is covered with a layer of gravel or soil, which protects it from the sparks of burning material in the case of fire. As the material is isolated from the boarding, no warping or shrinking can affect it. It will give with any slight settlement and will also withstand the expansion and contraction in steel and concrete, and the vibration from machinery, &c. The catalogue issued by Messrs. Vulcanite, Ltd., of 118, Cannon Street, London, E.C., contains a number of illustrations of buildings where Vulcanite roofs have been used, and also specimen specification clauses, testimonials, and diagrams illustrating the construction of Vulcanite roofs. The illustrations show a somewhat remarkable adaptation of Vulcanite—namely, for the construction of timber roof tanks which carry water to the weight of 100 tons or more. There are few, if any, other similar materials that could contain water on the top of a building in this way without risk of leakage. At the Royal London Friendly Society's premises in Finsbury Square Mr. John Belcher, A.R.A., used a roof tank containing water to the depth of 5½ft. waterproofed with Vulcanite. An official fire test was carried out by the British Fire Prevention Committee showing the relative fire-resisting qualities of a Vulcanite roof and an ordinary slated roof. The temperature ranged from 800° to 1,650° Fahr., and the test was continued for one hour. The Vulcanite roof remained intact and stood being jumped upon.

Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, *Great New Street, Fetter Lane, E.C.*

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Acton.—For the erection of new magistrates' courts, for the Middlesex County Council. Mr. H. T. Wakelam, county architect, Middlesex Guildhall, Westminster.

R. Wilkins & Sons	£7,379
W. Gibson & Co.	7,284
Leslie & Co.	7,013
Johnson & Co.	6,849
Spiers & Son	6,784
W. Johnson & Co.	6,764
Treasure & Son	6,754
H. Lovatt, Ltd.	6,690
W. F. Vigor & Co.	6,689
Waring and Gillow	6,680
F. G. Minter	6,677
Speechley & Smith	6,675
H. Knight & Son	6,595
Wisdom Bros.	6,575
H. Willcock & Co.	6,575
Patman & Fotheringham	6,523
J. C. Mather	6,500
M. E. Fitt	6,463
C. Wall, Limited	6.400
Galbraith Bros.	6,390
T. H. Kingerlee & Sons	6,387
W. Lawrence	6,384
A. N. Coles	6,372
J. Dorey & Co.	6,360
A. & B. Hanson	6,340
F. Gough & Co.	6,284
Edwards & Medway	6,220
W. J. Dickens	6,200
F. & G. Foster	6,144
J. Barker & Co.	6,083
A. Hudson & Co.	6,060
J. Garrett & Son	6,044
B. E. Nightingale	5,998
G. H. Gibson*	5,947
W. H. Hyde	5,788

* Accepted.

Beckenham.—For the erection of extensions to and the modernisation of the existing boys', girls' and infants' departments of the public elementary schools in Bromley Road, for the Beckenham U.D.C. Mr. John A. Angell, surveyor :—

S. G. Gee	£7,676	0	0
H. Heathfield	6,121	0	0
B. E. Nightingale, Albert Embankment	5,967	0	0
F. W. Green	5,893	10	0
Jones & Andrews	5,798	0	0
T. Crossley & Sons, Bromley	5,683	0	0
J. Lonsdale, Swanley Junction	5,651	0	0
F. & G. Foster, Norwood Junction	5,591	0	0
J. & C. Bowyer, Upper Norwood	5,555	0	0
Hawkey & Oldman,* Mile End, E.	5,465	0	0

(Rest of Beckenham.)
* Accepted.

Grimsby.—For the continuation southwards of Haycroft culvert. Mr. H. Gilbert Whyatt, A.M.I.C.E., borough engineer and surveyor :—

Hewins & Goodhand, Grimsby	£3,075	0	0
J. Downham, Widnes	3,028	2	6
Mackay & Son, Edinburgh and Lincoln	2,916	10	11
C. Greenwood,* Hull	2,850	0	0

* Accepted.

Hereford.—Accepted for the erection of a villa residence and stables on the Moor Park Estate. Mr. Herbert Skyrme, architect, 138 Widemarsh Street, Hereford.

Evan Davies, Hereford	£525	0	0

Hereford.—For the erection of a pair of semi-detached villas at Fownhope, for Mr. C. H. Rowberry. Mr. Herbert Skyrme, architect, 138 Widemarsh Street, Hereford.

	Villas.			Rainwater Tanks, &c.		
John Hills	£701	10	0	55	0	0
Stone, Bros	698	14	6	92	2	6
Evan Davies	635	0	0	68	0	0
W. Powell *	615	0	0	76	0	0

(All of Hereford.)
* Accepted.

London, W.—For iron staircases, verandahs, &c., to be erected at the new buildings now in progress at Isleworth, for the Guardians of Brentford Union. Mr. W. H. Ward, architect, Paradise Street, Birmingham :—

J. Allen, sen., & Son, Glasgow	£3,180	10	0
Jones & Co., London	2,837	0	0
St. Pancras Iron Co., London	2,580	0	0
C. Wall, Ltd., London	2,490	0	0
T. Potter & Sons, Fulham	2,456	0	0
J. S. Fairfax & Co., London	2,374	0	0
Griffin Ironworks, Birmingham	2,150	0	0
Haward Bros., London	1,756	0	0
Herring & Son, Chertsey	1,650	0	0
H. & C. Davis & Co.,* Clapham	1,495	0	0

* Accepted.

Morpeth.—For the erection of an entrance lodge at Bothalhaugh, for the Hon. and Rev. W. C. Ellis. Mr. L. A. Loades, architect, Morpeth :—

Waterston & Sons, Morpeth	£919	0	0
G. & C. Haswell, Morpeth	887	13	7
M. G. Routledge, Morpeth	858	0	0
Carse & Son, Amble	780	0	0
T. Field, Newbiggin	750	18	4
Gordon Bros.,* Choppington	688	15	0
P. Cuthbert, Cramlington	680	0	0

*Accepted.
Gates, &c. not included.

Port Talbot.—For the erection of shops and premises in Station Road. Mr. Frank B. Smith, architect, Port Talbot :—

Jno. Davies	£1,270
M. Cox	1,140
Anderson & Vaughan	1,136
Stephen Rees	1,075
J. Davey	1,000
Thos. Williams	980
J. Nicholas	973
E. W. & P. Williams	890

(All of Port Talbot.)
*Accepted.

Seaford, Sussex.—For the erection of Eversley Boarding House, for the Seaford West Co. Mr. J. W. B. Blackman, P.A.S.I., architect, Brighton and Seaford. Quantities by Mr. Hy. Curtis Card, F.S.I.

Sanders Bros., Brighton	£3,876
Rich, T., Hailsham	3,271
Martin, J., Eastbourne	3,261
Bulled & Co., Croydon	3,209
Field & Co., Brighton	3,161
Webb, F. J., Godstone	3,132
Young, H., East Grinstead	2,998
Morling Bros., Seaford	2,972
Potter Bros., Horsham	2,950
Wilkinson, Seaford	2,889
Godfrey Bros., Seaford	2,772
Leeney & Sons, Tunbridge Wells	2,785
Cook & Sons, Crawley	2,684
Streather, E.,* Croydon	2,495

* Accepted.

Slapton.—For the erection of a vicarage house. Mr. W. F. Tollit, architect, 10, High Street, Totnes :—

P. Wilson & Co., East Prawle	£1,275	0	0
G. B. Andrews, Ivybridge	1,224	0	0
W. C. Mitchell, Frogmore, Kingsbridge	1,142	13	0
Rhymes & Clements, Slapton, Kingsbridge	1,140	0	0
W. Edgcombe*, Strete, Dartmouth	1,005	13	5

* Accepted.

Uxbridge (Middlesex).—For the erection of new magistrates' courts for the Middlesex County Council. Mr. H. T. Wakelam, county architect, Middlesex Guildhall, Westminster, S.W. :—

J. G. Mather	£7,700
L. & W. H. Patman	7,045
Higgs & Hill	6,984
Patman & Fotheringham	6,963
Holloway Bros.	6,930
A. Porter	6,921
G. H. Gibson	6,794
G. Godson & Sons	6,785
D. D. Heath	6,701
C. Wall, Ltd.	6,700
Wisdom Bros.	6,630
J. Dorey & Co.	6,593
Fassnidge & Son	6,547
W. Phillips & Son	6,480
H. Knight & Son	6,404
A. Fairhead & Son	6,397
C. F. Kearley	6,394

County Architect's estimate, £6,500.

Yiewsley.—For the reconstruction of Colham Bridge, for the Middlesex County Council. Mr. H. T. Wakelam, M.I.C.E., county engineer, Middlesex Guildhall, Westminster, S.W

A. Thorne	£2,560	17	0
Johnson & Hunt	2,465	19	3
Kirk & Randall	2,268	0	4
D. G. Somerville	2,260	11	7
J. H. Macdonald	2,199	0	0
J. Ellis	2,197	16	1
Pethick Bros.	2,197	0	0
M. Dinnie	2,165	19	3
Mowlem & Co.	2,117	9	10
C. Ford	2,108	12	3
Davies, Ball & Co.	2,084	9	6
Jackamans & Co.	2,066	4	3
Wimpey & Co.	2,058	0	4
W. Muirhead & Co.	1,961	14	11
G. Rutter	1,922	8	0
J. Jackson	1,919	14	0
A. & B. Hanson	1 857	0	0
H. Morecroft	1,790	0	0

County Engineer's estimate, £1,800.

New Buildings for the Sandroyd Schools at Cobham have been erected from designs by Mr. Leonard Martin, F.R.I.B.A., of Cobham, a member of the firm of Messrs. Treadwell & Martin, of London. The buildings are of local red bricks, rough-cast and sand-faced. The roofs are tiled. The builders were Messrs. Martin, Wells & Co., of Aldershot.

Glazing.—Messrs. Mellowes & Co., Ltd., of Corporation Street, Sheffield, have recently been favoured with orders for glazing, on their "Eclipse" Patent Imperishable System, the roofs of :—Messrs. Powell Duffryn Steam Coal Co., Ltd., Aberdare; Beardmore & Co., Ltd., Glasgow; Cammell, Laird & Co., Ltd., Sheffield; Tranmere Bay Development Co., Ltd., Birkenhead; Atherton & Walkden Car Sheds; and Dukinfield Wagon Shops, Great Central Railway.

Complete List of Contracts Open.

WITH a few exceptions, news of Contracts Open are not repeated after they have been published once in these columns, so that readers will find particulars in our previous issues of other contracts that still remain open.

Unless expressly stated to the contrary, all deposits required for bills of quantities, &c., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair-wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

August 24. Belfast.—*Construction of the following works* for the Cemetery and Parks Committee: (*a*) Wooden bridge and (*b*) shelter in Victoria Park. (*c*) Plant house and (*d*) forcing pits in Ormeau Park. (*e*) Shelter in Botanic Gardens Park. Plans and specification may be seen and forms of tender obtained in the City Surveyor's Office. Separate sealed tenders, endorsed "Tender for (as the case may be)," to be lodged with S. Black, town clerk, not later than 10 a.m. on August 24.

August 24. Treherbert.—*Alterations and extensions at the Dunraven Council School, Treherbert*, for the Rhondda Urban District Council. Plans and specification may be seen and bills of quantities obtained at the office of J. Rees, architect, Hillside, Pentre, on the deposit of £2 2s. with the Accountant at the Council Offices, Pentre. Sealed tenders, endorsed "Tender for Dunraven School Extensions," accompanied by the priced quantities under separate cover, must reach T. W. Berry, director of Education Council Offices, Pentre, Rhondda, not later than the first post on August 24.

August 25. Swindon.—*Erection of schoolroom for Primitive Methodist trustees*, Upper Stratton, Swindon. Specifications and plans are deposited with S. Fry, 152, Cricklade Road, Swindon. Sealed tenders to be sent to M. Ford, the Farm, Upper Stratton, Swindon, not later than August 25.

August 25. Edinburgh.—*Additions to the Royal Victoria Hospital for Consumption, Edinburgh.* Applications for schedules must be lodged with Sydney Mitchell & Wilson, architects, 13, Young Street, Edinburgh. Schedules will be forwarded as soon as they are ready, and tenders must be lodged with the architects not later than August 25.

August 25. Bradford.—*Alterations, general repairs, painting, &c., at the Bradford Council School* for the Devon County Education Committee. The drawings and specification can be seen, and forms of tender obtained, at the School between the hours of 9.30 a.m. and 5 p.m. Tenders must reach the Architect, 1, Richmond Road, Exeter, not later than the first post on August 25.

August 25. Blaenawynfi.—*Erection of a new Mission Room* at Blaengwynfi for the Rev. John Williams and members. Plans and specifications may be seen with W. Lewis, Commercial Street, Abergwynfi, and of Evans & Jones, architects and surveyors, 4, Trinity Place, Swansea, where quantities may be obtained on deposit of £1 1s. Sealed tenders, to be endorsed "Mission Room" to be delivered to W. Lewis not later than August 25.

August 25. Abergavenny.—*Making additions and extensive improvements to the Cardiff Arms, Abergavenny: also for the building of new stores, stabling, and other works for the Hereford and Tredegar Brewery Co., Ltd., Hereford.* Plans and specifications may be seen and further particulars and forms of tender obtained of B, J. Francis, architect, Abergavenny. Tenders, sealed and endorsed, to be sent to the architect not later than August 25.

August 25. Newport.—*Additions and alterations* for the Isle of Wight County Education Committee at the Technical Institute, Newport. Plans and specifications may be seen at the County Education Offices, Newport, I.W., or at the office of the architect, 5, St. Thomas's Street, Ryde, I.W., where all information may be obtained. Sealed tenders, endorsed "Technical Institute," must reach F. G. Flux, County Education Offices, Newport, I.W., on or before August 25.

August 25. Bangour.—*Construction of the unloading shed* at Bangour Village Station, for the Edinburgh District Lunacy Board. The relative schedule may be obtained on application to H. J. Blanc, R.S.A., architect, 25, Rutland Square, Edinburgh, where specification, general conditions of contract, &c., will be exhibited. The schedules shall be priced, extended, and lodged with J. Kyd, clerk and treasurer, District Lunacy Board Offices, Castle Terrace, Edinburgh, not later than August 25 at 10 a.m., along with the tender.

August 27. Durham.—*Joiner work in connection with the conversion of the Straw-house in the Upper Yard into a 3-stalled stable.* Plans may be seen and specifications had on application to J. T. Pegge, city surveyor, 60, Saddler Street, Durham. Tenders to be delivered by noon August 27.

August 27. Leeds.—*Alterations and additions to Pool School* for the Managers. Persons desirous of tendering for the whole of the trades required in the above work are requested to send in their names to G. W. Atkinson, Architect, 1, Mark Lane, Leeds, before August 27, after which date quantities will be forwarded to him.

August 27. Middlewich.—*Alterations and extensions at No. 2 Branch, Lewin Street, Middlewich*, for the Winsford Industrial Co-operative Society, Ltd. Plans and specifications may be seen at the branch in Middlewich. Tenders, endorsed "Branch Alterations." to be sent in to W. Fryer, secretary, not later than 12 noon on August 27.

August 27. Hawthorn.—*Erection of a Mission Hall* at Hawthorn, Pontypridd, for the Trustees of the English Baptist Church. Plans and specification may be seen of A. LL. Thomas, A.M.I.M.E., architect and engineer, Church Street Chambers, Pontypridd. Tenders to be sent to the Rev. E. Lewis, 89 Wood Road, Pontypridd, by August 27.

August 27. Ashton-on-Ribble, Preston.—*New church.* Contractors desirous of submitting tenders for the whole or separate trades may see the plans, &c., at the office of Austin & Paley, architects, Lancaster. Bills of quantities may be obtained on application to Wright & Son, surveyors, Lancaster. Tenders to be delivered (under cover) to the Architects not later than noon, August 27.

August 27. Hockley.—*Erection of scattered homes at Hockley*, for the Guardians of the Rochford Union. Plans and specifications may be seen at the office of Greenhalgh & Brockbank, architects, in Southend, any day between the hours of 10 a.m. and 4 p.m. The person whose tender is accepted will be required to enter into a contract and find a surety (who must be approved by the Guardians) to be jointly liable with the contractor for the due performance of the work. Tenders must be delivered to F. Gregson, clerk, Southend-on-Sea, on or before August 27.

August 27. Knotty Ash.—*Erection at Highfield Infirmary, Knotty Ash, of laundry buildings*, according to plans and specifications, to be seen at the office of E. Kirby and W. E. Willink, architects, 5, Cook Street, Liverpool, between the hours of 10 o'clock a.m. and 5 o'clock p.m. Bills of quantities, conditions of contract, and forms of tender (upon which alone offers will be received) may be obtained at 5, Cook Street, on payment of a deposit of £2. Sealed tenders must be delivered to H. J. Hagger, vestry clerk, Parish Offices, Brownlow Hill, not later than August 27.

August 28. Pontycymmer.—*Erection of school hall* at Pontycymmer for the English Calvinistic Methodist Church; plans and specifications may be seen with O. Jones, 16, Meadow Street, Pontycymmer, or A. Ll. Thomas, A.M.I.M.E., architect and engineer, Church Street Chambers, Pontypridd. Sealed and endorsed, Tenders to be sent O. Jones on or before August 28.

August 28. Eastby, near Skipton.—*Erection of an entrance lodge at the Sanatorium*, Eastby, near Skipton. Contractors desirous of tendering for this work are requested to forward their applications along with a deposit of £1 1s. to F. Holland, engineer and architect to the Board, 11, Parkinson's Chambers, Hustlergate, Bradford (T.N. 1529). Particulars will be forwarded in due course. Drawings and specifications may be seen at the Architect's offices. Sealed tenders, on separate forms of tender supplied, to be endorsed "Eastby," to be sent to G. M. Crowther, clerk to the Guardians, 22, Manor Row, Bradford, not later than 10 a.m. on August 28.

August 28. Romford. — *The erection and completion of one ward for 14 beds, nurses' quarters, convalescent block.* The drawings, specification, and form of contract may be inspected at the offices of F. Whitmore, architect, 73, Duke Street, Chelmsford, between the hours of ten and five o'clock on any working day except Saturday. Builders desirous of tendering must send at once their names and addresses to the architect, enclosing a deposit of £5, when a copy of bill of quantities and form of tender will be sent. The contractor may be required to give a bond in the sum of £250 as security for the due performance of the contract. Any tender accepted must be subject to the approval of the Local Government Board. Sealed tenders, endorsed "Tender for Extension Isolation Hospital," must be sent to W. Smith, clerk, North Street, Romford, on or before August 28.

August 29. Glasgow.—*Proposed alterations to Whitevale Depôt.* The whole work will be let in one contract, and includes brick, cast iron and steel, carpenter and joiner, slater, plumber, and painter works. Each offerer must submit, along with his tender, a list of the sub-contractors he would propose to employ. Plans can be seen, and forms of tender obtained, on application to J. Dalrymple, general manager, 46, Bath Street, Glasgow. Tenders, marked "Tramways—Tender for Alterations to Whitevale Depôt," must be lodged with A. W. Myles, town clerk, City Chambers, Glasgow, not later than 10 a.m. on August 29.

August 30. Grimsby.—*Erection of proposed new buildings*, Humber Bank, N. Fish Docks, for J. Bygrave, Ltd. Plans, specifications, form of tender, and all particulars may be obtained at the office of their architect, H. Heap, Assoc.M.Inst.C.E., architect and surveyor, Osborne Chambers, between the hours of 9 a.m. and 6 p.m. Sealed tenders, which must be endorsed "Tender for Proposed New Buildings," and addressed to J. Bygrave, Ltd., must be delivered at their premises, Fish Dock Road, Grimsby not later than August 30.

August 31. Cwm.—*Erecting a Fire Station at Cwm* for the Ebbw Vale Urban District Council. Plan and specification may be seen and form of tender, with bill of quantities, obtained by appointment at the office of T. J. Thomas, town surveyor. A deposit of 10s., which must be in postal orders, will be required from each person who obtains a copy of the form of tender. Tender, enclosed in a sealed envelope, endorsed on the outside "Tender for Fire Station at Cwm," should be delivered to T. Hughes, clerk, Ebbw Vale, not later than August 31.

August 31. New Malden.—*Building a boundary wall, erecting wood and iron fencing and forming a path at Norbiton Common Farm, New Malden*, Surrey, in accordance with plans prepared by W. H. Hope, C.E., architect and surveyor, Hampton Wick. The drawings may be seen and a copy of the specification and form of tender obtained on application to J. Edgell, clerk to the Guardians, Union Offices (opposite Norbiton Railway Station), Kingston-on-Thames, between the hours of 9 a.m. and 4 p.m. and until 1 p.m. on Saturdays. Fair wages clause. Tenders to be delivered to J. Edgell not later than August 31.

August 31. Mirfield.—*Alterations and additions to the Mirfield Grammar School.* Intending contractors may see the plans and specifications and obtain bills of quantities at the offices of the Architect, No. 4, Oxford Place, Leeds. Sealed tenders are to be sent in, not later than 4 p.m., addressed to G. Topham, solicitor, Mirfield, not later than August 31.

Sept. 3. Fife. — *Erection of joint infectious diseases hospital* near St. Michael's, Leuchars, Fife. Applications for schedules must be lodged with W. Carruthers Laidlaw, architect, 4, York Buildings, Edinburgh, from whom schedules can be obtained on payment of a deposit of £1. All tenders must be lodged with the architect not later than Sept. 3.

Sept 3. Stourton.—*Providing and erecting a wood and iron fencing* round the new sewage disposal works at Stourton, for the Rothwell Urban District Council. Plans and specfication can be seen and particulars obtained at theoffices of E. J. Silcock, M.I.C.E., engineer, 10 Park Row, Leeds. Sealed tenders, endorsed "Stourton Fencing" must be delivered to W. Dodgson, clerk to the Council, Council Offices, Rothwell, near Leeds, not later than noon Sept. 3.

September 3. Castleblayney.—*Erection of a goods store (90ft. × 25ft.) and Office (20ft. × 14ft.)* of timber, with galvanised corrugated iron roof, &c., at their Castleblaney Station, for the Directors of the Great Northern Ry. Co (Ireland). Parties wishing to tender may see the drawing and specification at the office of W. H. Mills, Engineer-in-Chief, Amiens Street Terminus, Dublin, or copies of them at the office of the District Engineer, Belfast, and forms of tender can be obtained at either of the said offices on payment of 1s. each. Tenders made out on the forms supplied by the Company, and endorsed "Tender for Goods Store," should be delivered to T. Morrison (Secretary), Secretary's Office, Amiens Street Terminus, Dublin, not later than 10 a.m. on Sept. 3.

Sept. 3. Ballycastle.—*Erection of the following cottages*, for the Rural District Council, upon the several sites shown on the deposited plans in the following townlands:—Double cottage in the townland of Maghernahar; double cottage in the townland of Toberkeagh; double cottage in the townland of Ballycleagh; double cottage in the townland of Moycraig Lower; double cottage in the townland of Ballypatrick; double cottage in the townland of East Torr; double cottage in the townland of Eglish; block of three cottages in the townland of Coolkenny; block of four cottages in the townland of Capecastle; block of four cottages in the townland of Coolnagoppoge: block of four cottages in the townland of Townparks; block of six cottages in the townland of Drumawillin. The contractor can be put into possession of the sites immediately after the execution of the contract. The deposited maps and the plans, specifications, and draft contract may be inspected in the office of H. M'Gill, clerk of the Ballycastle Rural District Council, Boardroom, Ballycastle, from 10 a.m. to 4 p.m. each day by intending contractors. Tenders must be upon the prescribed form (which can be obtained at the above office) and in strict conformity with the specification, and must be sealed and addresed to the presiding chairman, Ballycastle Rural District Council, and marked "Tender for Cottages," and must be received by H. M'Gill not later than 3 p.m. on September 3. The names and addresses of two solvent sureties must accompany each tender. Separate tenders must be sent in for the erection of each block of cottages.

Sept. 4. Lochmaben.—*Erection of the Lochmaben Combination Hospital* for the Board of Directors. Plans may be seen with, and schedules obtained from F. Carruthers, Esq., architect, 35, Buccleuch Street, Dumfries, on payment of £1 1s. Mr. Carruthers will meet intending contractors at the Town Hall, Lochmaben, on August 28, between the hours of 11 a.m. and 3 p.m.; and all tenders must be lodged with John Ford Cormack, solicitor, Lockerbie, clerk to the Combination, on or before September 4.

Sept. 4. London, W.—*Execution of ordinary works and repairs to buildings, &c.*, in the charge of the Commissioners of His Majesty's Works and Public Buildings in the London district for three and a half years from October 1, 1906. The printed schedule, with form of tender, may be obtained at His Majesty's Office of Works, Storey's Gate, Westminster, between the hours of 11 a.m. and 5 p.m., upon payment of £1. Tenders must be delivered before 12 o'clock noon on Sept. 4, addressed to the Secretary, H.M. Office of Works, Storey's Gate, London, S.W., and endorsed "Tender for Ordinary Works and Repairs, London."

Sept. 4. Blackrock.—*Works in connection with the New Assembly Room, Town Hall, Blackrock*, for the Urban District Council. (a) Overhauling and repairing roof, (b) erection of gas fittings, (c) extension and repair of present ceiling, (d) relaying of present floor, (e) decorating and painting walls, &c. Tenders for each of the several works to be on separate forms. Specifications can be seen and full particulars obtained at the Surveyor's office, Town Hall, Blackrock. Materials must be, as far as possible, of Irish manufacture. Fair wages clause. Tenders (which are to be on prescribed forms) must be lodged with R. F. Heron, town clerk, Town Hall, Blackrock, Co. Dublin, on or before four o'clock p.m. on September 4.

Sept. 4. Maidstone.—*New Police Station on land adjoining Mill Street.* Applications for bills of quantities and form of tender to be made at the offices of Ruck and Smith, architects, 86, Week Street, Maidstone, where plans and specification may be seen on or before August 27, after which date no application can be entertained. A copy of the quantities and form of tender will be supplied to those who have made application, in exchange for £2 2s. Sealed tenders, which will only be received on the form supplied, to be sent to S. L. Monckton. Town Clerk's Office, King Street, Maidstone, endorsed "Tender for new Police Station," on or before noon on September 4. Should any tender be accepted, it will be on condition that the sanction of the Local Government Board is given to the necessary loan for cayrying out the scheme.

Sept. 5. Manchester. — *Erection of the Domett Street Municipal School, Blackley, Manchester.* Plans may be seen and a copy of the bills of quantities (including specification) may be obtained at the Education Offices, Deansgate, Manchester, on a deposit of £2 2s. Tenders, on the official forms, and enclosed in the envelopes provided, must be delivered not later than September 5. Cheques to be made payable to the Accountant, Education Offices, Deansgate, Manchester.

Sept. 5. Manchester.—*Alterations and additions to the Abbott Street Municipal School, Rochdale Road, Manchester.* Plans may be seen and a copy of the bill of quantities (including specification) may be obtained at the Education Offices, Deansgate, Manchester, on a deposit of £2 2s. Tenders, on the official forms and enclosed in the envelopes provided, must be delivered not later than Sept. 5. Cheques to be made payable to the Accountant, Education Offices, Deansgate, Manchester.

Sept. 8. Derby.—*Erection of a new school* on a site between Clarence and Porter Roads. Plans, specfications, and conditions of contract may be seen and schedules of quantities may be obtained, on application to Hunter and Woodhouse, All Saints' Chambers, Iron Gate, Derby. The sum of £1 1s. will be charged for the schedule of quantities. Tenders on the form supplied, together with the priced schedule of quantities, must be delivered at the Education Office, Becket Street, Derby, before 12 o'clock at noon on Sept 8, endorsed "Tender for New School on Clarence Road." Fair wages clauses. Tenders will be accepted from Derby firms only.

September 10. Salford.—*Extensions to car depot and workshops* for the Tramways Committee. Contract 145, constructional steelwork; contract 146, builders' work, in their erection and completion of extensions to the Central Car Depot, Frederick Road, Pendleton. Forms of tender and bills of quantities for either contract may be obtained on application to the General Manager, Tramways Department, 32, Blackfriars Street, Salford, upon depositing a cheque for £2 2s. Plans can be inspected and further particulars obtained at the above-mentioned offices. Tenders endorsed "Steelwork" (or "Buiders' Work" as the case may be) "Car Depot Extensions," and addressed to the Chairman, Tramways Committee, Town Hall, Salford, must be delivered to L. C. Evans, town clerk, Town Hall, Salford, not later than 3 p.m. on September 10.

Sept. 11. Manchester.—*Execution of Alterations at the Benton Technical Institute* for the Lancs. Education Committee. The plans may be seen and bills of quantities obtained at the offices of J. W. Beaumont & Son, 10, St. James's Square, Manchester. Tenders must be delivered before 12 o'clock noon on September 11, sealed and endorsed, to W. F. Knott. Parish Offices, Ashton-under-Lyne.

Sept. 11. Audenshaw.—*Erection of a new public elementary school* at Audenshaw. The plans may be seen and bills of quantities obtained at the office of Henry Littler, county architect, 16, Ribblesdale Place, Preston, by payment of a deposit of £2. Tenders must be delivered before 12 o'clock noon on September 11, sealed and endorsed, to W. F. Knott, Parish Offices, Ashton-under-Lyne.

Sept. 12. Merthyr Tydfil.—*Additions and improvements* to Bethesda Congregational Chapel, Merthyr Tydfil. The plans and specifications can be seen with Mr. Rees Jones, grocer, Bethesda Street. The tenders to be sent, sealed and endorsed, to J. Thomas, 90, Brecon Road, Merthyr Tydfil, not later than September 12.

Sept. 27. London, E. — *Additions and alterations in the building at the Electricity Works*, Osborn Street, Whitechapel, E., Persons tendering must submit the names and addresses of two substantial persons willing to be jointly and severally bound for the due and proper performance of the contract. Fair wages clause. The drawings may be seen and copies of the stipulations, specification, schedule, and form of tender may be obtained by applying to M. W Jameson, A.M.Inst.C.E., borough engineer, 15, Great Alie Street, Whitechapel, E., between the hours of 10 a.m. and 12 noon, upon paying £5. Tenders, endorsed "Tenders for Additions to Electricity Buildings," should be sent to G. W. Clarke, town clerk, 15, Great Alie Street, Whitechapel. E., in the envelopes supplied, so as arrive at this office on before 12 o'clock noon on September 27.

No date. Billericay.—*Additions and alterations to the workhouse of Billericay Union, also for the erection of new receiving wards.* Builders desirous of tendering must send in their names and addresses to Walter J. Wood, architect, 26, Alexander Street, Southend-on-Sea. and 1, Finsbury Circus, London, E.C., with a deposit of £1 1s., when a copy of the bill of quantities and form of tender will be forwarded as soon as same are ready. The builder whose tender is accepted will be required to enter into a contract and give a bond with two approved sureties for the due performance of the terms thereof. In sending in their names to the architects, builders must also give two references as to recent work carried out. Any tender accepted will be subject to the approval of the Local Government Board. The plans and specifications can be seen at the workhouse, Billericay, or the architect's office, at Southend-on-Sea, after the quantities have been sent out, between the hours of 10 a.m. and 5 p.m. The date by which tenders must be sent in will be announced in the form of tender.

No date. Kendal. — *Building an Infants' Sunday School* in Highgate, Kendal, for the Trustees of Zion Chapel. Plans can now be inspected and names of intending contractors for bills of quantities received of J. Hutton, M.R.S.I., architect, Kendal. Tenders to be sent in to him on the date specified on quantities.

ENGINEERING.

August 28. Fairfield.—*Construction of a concrete storage reservoir* at Turner Lodge, Fairfield, near Buxton, to hold 4,000,000 gallons. Drawings may be seen, and copy of specification, bill of quantities, and form of tender obtained at the offices of Swann and Brady, engineers, Town Hall, Chapel-en-le-Frith, via Stockport, on payment of £2 2s. Sealed tenders, endorsed "Tender for Reservoir," to be delivered to C. Slater, Council Offices, Fairfield, Derbyshire, on or before August 28.

August 28. London, S.E.—*Providing and fixing of about 170 yards of 3 in. to 5 in. steam pipe with valves and accessories*, at Workhouse, Renfrew Road, Lower Kennington Lane, S.E., for the Guardians of the Poor of the Parish of Lambeth. Specification and form of tender can be obtained from George E. Arnold, consulting engineer to the Guardians, 195, Kennington Road, S.E., and form of contract can be seen at that address. Tenders must be sent by post not later than August 28, to W. Thurnall, clerk to the Guardians, Guardians' Board Room and Offices, Brook Street, Kennington Road, S.E., sealed and superscribed "Tender for Steam Pipes."

August 29. Bradford.—*Hot-water supply apparatus* at the City Hospital, Leeds Road. Drawings and general conditions of contract may be seen and bill of quantities and form of tender obtained on application to the City Architect, Whitaker Buildings, Brewery Street, Bradford. Sealed tenders (endorsed) must be sent to F. Stevens, town clerk, Town Hall, Bradford, not later than 12 o'clock noon on August 29. The contract will be let subject to the fair contract clauses of the Corporation, which may be seen at the Town Clerk's Office and which the accepted contractor will be required to sign.

August 31. Bristol.—*Third instalment of the superstructure of the Avonbank Electricity Works, Feeder Road, comprising steelwork, masonry, concrete, &c.* Drawings, specifications, and forms of tender may be seen at the office of H. F. Proctor, city electrical engineer, Temple Back, Bristol, on payment of £2 2s. Tenders must be delivered by noon on August 31, addressed to H. F. Proctor, and endorsed "Tender for Superstructure."

August 31. Belgium.—*Improvement of the Canal from Ghent to Bruges in the neighbourhood of the Lovendegem and Meerendré bridges*, for the Belgian Government, at an estimated cost of £15,501. Tenders must be delivered at the Hôtel des Ponts et Chaussées, 22 Rue Basse des Champs, Ghent, before August 31. Specification (No. 105 of 1906) and plans may be obtained from the Bureau Central des Renseignements, Rue des Augustins, No. 17, Brussels, at a cost of 0fr. 50c. for the former, and 12fr. 30c. for the latter. A copy of the specification may be seen at the Commercial Intelligence Branch of the Board of Trade, 73, Basinghall Street, London E.C.

Sept. 1. Christiania (Norway).—*Supply and erection of about 42 tons of iron framework bridges.* Tenders (through agent residing in Norway) to be sent to Veidirektorens Kontor, Akers Gade 42 IV., Christiania, not later than Sept. 1.

Sept. 1. Zamora (Spain).—*Construction of a bridge* over the Tera river, 117,609 pesetas. General information and specifications may be had on application to Conseil-General de la Province, Zamora. Tenders must be delivered by Sept. 1.

Sept. 1. Glasgow.—*Supply, delivery, and erection, under one contract of the whole of the machinery and accessories required for the mechanical equipment of the machinery buildings* at Shieldhall out-fall works. Specifications and forms of tender may be had on application at the office of Public Works, City Chambers, 64, Cockrane Street, Glasgow, by depositing the sum of £10 10s. Plans and drawings may be seen and further particulars obtained at the office of W. D. Hamilton, Consulting Engineer, 59, Bath Street, Glasgow. Tenders, marked outside "Tender for Sewage Disposal Machinery, Shieldhall," must be lodged with A. W. Myles, Town Clerk, City Chambers, Glasgow, on or before September 1.

Sept. 4. Lancaster. — *Proposed re-construction of steam heating arrangements* and hot water service at County Lunatic Asylum, Lancaster. Tenders to be sent by September 4th (extended date) to J. T. Cheetham, clerk and steward.

Sept. 4. Wiveliscombe.—*Boring a trial artesian well* for the Wiveliscombe District Council within their district. Specifications of the work can be seen at the office of T. V. Pearse, clerk to the Wiveliscombe District Council, on any week day (except Saturdays) between the hours of 10 and 5, and to whom tenders should be sent on or before Sept. 4, marked "Tender for Trial Boring."

Sept. 6. Habana (Cuba).—*Construction and working of four lines of railway in Cuba.* Specifications and particulars may be obtained on application to the Ministry of Public Works, Habana. Tenders to be sent on not later than Sept. 6.

Sept. 6. London, N.—*Providing and fixing (1) hot water and heating arrangements, (2) fire mains and hydrants, (3) gas supply and fittings, (4) electrical installation*, at the two new blocks now being erected at the St. John's Road Workhouse, Upper Holloway. Copies of specification and further particulars with forms of tender can be had at the office of W. Smith, architect, 65, Chancery Lane, W.C., up to the 30th inst., upon depositing £2. Tenders must be sealed up and addressed to the Guardians and delivered to E. Davey, clerk, Guardians' offices, St. John's Road, Upper Holloway, N., not later than two o'clock in the afternoon of September 6, endorsed "Tenders for . . . ," and the same will then be opened at a meeting of the Guardians.

Sept. 7. Caistor.—*Construction and testing of a new water main at Moortown*, for the Rural District Council. The plans, general conditions, and specifications can be seen and bill of quantities and form of tender for the contract can be obtained on payment of £2 2s., at the offices of the Council at Caistor, and also at the offices of E. J. Silcock, M.Inst.C.E., engineer, 10, Park Row, Leeds. Sealed tenders, endorsed "Moortown Water," must be delivered to A. A. Padley, solicitor, clerk to the Council, Council Offices, Caistor, not later than September 7.

Sept. 13. Madrid.—*Extension of the Lage quay, and the provision of accommodation for travellers at the port of Vigo*, at the estimated cost of 223,009 pesetas (about £7,964). A deposit of 11,100 pesetas (about £396) is required to qualify any tender. Local representation is needed. The "Gacetas de Madrid," containing notice of tender, may be seen at the Commercial Intelligence Branch of the Board of Trade, 73, Basinghall Street, E.C. Tenders will be opened on September 13 at the Directorate General of Public Works, Madrid.

Sept. 15. Vienna (Austria). *Construction of a section of the railway from Trient to Malo.* Specification and particulars may be had on application to Eisenbahnbaudirektion, VI., Gumpendorferstrasse 10, Vienna. Tenders must be sent in by Sept. 15.

Sept. 15. Handsworth.—*Supply and fixing* of the following for the Urban District Council:—Wiring, fittings, &c., for the electric lighting of the new Council schools, Canterbury Road, Handsworth; wiring, fittings, &c., for the electric lighting of the new Council schools, Westminster Road, Handsworth. Drawings, specifications, and conditions of contract may be obtained on and after Saturday, Sept. 1, from F. A. Nixon, electrical engineer, Generating Station Soho Road, Handsworth, on payment on £1 1s, All drawings, specification and conditions of contract must be forwarded with tender. Tenders, on the prescribed form, must be forwarded in the endorsed envelope supplied for that purpose, and should be delivered at the Education Offices not later than Sept. 15. Fair wages clause.

Sept. 24. Jassy—Roumania.—*Water supply and sewerage of the City of Jassy.*—The estimated cost is as follows: Water Supply: For Earthworks, Subterranean Galleries, c., 271,486.40f.; Iron Mains, &c., from the source to the City, a distance of 91 kilometres, 6,470,000.00f.; Distribution in the City, 1,159,914.79f.; for Reservoirs in the City, 646,000.00f.; Total, 8,547,401.19f. Sewerage: For Main Sewers, Gullies, &c., total, 1,887,607.20f. The works will be let in one contract only, but separate tenders must be submitted for each work, showing the percentage over or under schedule prices. A guarantee of 4 per cent. of the total value must be deposited with the tenders, and an additional 2 per cent. on the signing of the contract. Payments will be made monthly in Roumanian money, on materials delivered and works completed. Plans and specifications may be seen, and all further information obtained at the Chief Engineer's Office, Town Hall, Jassy. Tenders to be delivered on or before September 24.

Sept. 28. South Shields.—*Warming and ventilation, on the Plenum system*, of a block of four school departments, accommodating a total of 1,950 scholars, to be erected on the site of the Mowbray Council School, South Shields, subject to the approval of the plans for the same by the Board of Education and the Local Government Board. The plans may be inspected and further particulars will be supplied at the offices of Henry Grieves, A.R.I.B.A., architect, Albany Chambers, King Street, South Shields, to whom draft schemes and estimates must be delivered not later than September 28.

Oct. 10. Brussels.—*Construction of a section of the railway from Hannut to Huccorgne on the local railways from Hannut to Vinalmont and Burdinne to Huy.* The estimated cost of the work is 287,500fr. (£11,500), and a deposit of 29,000fr. (£1,160) is required to qualify any tender. Tenders by registered letter will be received at the "Société nationale des chemins de fer vicinaux" offices, 14 Rue de la Science, Brussels, not later than October 9. A copy of the specifications may be obtained on payment of 1fr. from M. Mahieu, Rue du Moulin, No. 3, Waremme.

November 3. Shanghai.—*Construction and erection of two steel girder bridges across the Soochow Creek to replace the present Garden Bridge and Chekiang Road Bridge.* The Garden Bridge will consist of two spans, each of 171 feet and having a width of 60 feet between the parapets. The Chekiang Road Bridge will be one span of 196ft. with a width of 40ft. between parapets. General conditions, specifications, drawings, forms of tender, and all other information may be obtained at the office of Charles Mayne, M.Inst.C.E., municipal engineer, No. 15, Hankow Road. A charge of Tls. 100 will be made for the specification and set of drawings. Sealed tenders, separately for each bridge, and endorsed "Garden Bridge," or "Chekiang Road Bridge," will be received by W. E. Leveson, secretary, Council Room, Shanghai, not later than noon on November 3.

Nov. 6. Madrid.—*Construction and working of a railway between Ferrol and Betanzos*, in accordance with conditions set forth in the "Gaceta de Madrid" of August 7. A Government subsidy of 3,054,508 pesetas (about £109,284), payable in eight annual instalments, will be granted to the concessionnaire. All materials imported for the construction of the line and for its working during the first 10 years will be exempted from import duties. A deposit of 145,259 pesetes (about £5,196) is required to qualify any tender. Tenders will be opened on Nov. 6 at the Directorate General of Public Works, Madrid.

IRON AND STEEL.

August 28. Ashford.—*Supplying and erecting about 325 feet run tubular iron fencing with cast iron standards and supplying and laying about 220 feet 1¼in. galvanised water pipe with hydrant* for the Maidstone Ashford cattle market. Plans and specifications may be seen at the offices of A. J. Burrows, F.S.I., surveyor, Bank Street, Ashford. Tenders are to be sent to F. Hughes-Hallett, secretary, Ashford, not later than August 28.

August 28. Maldon.—*Supply and laying of about 4,000 yards of 3-in. cast-iron water mains, in the Parish of Mayland.* Specifications and form of tender may be obtained at the offices of Price & Belsham, 52, Queen Victoria Street, E.C., on receipt of a deposit of £2 2s. Copies of same may be seen at, but not obtained from, the Offices of the Maldon Rural Council, 6, Market Hill, Maldon, Essex. Tenders must be sent in, endorsed "Mayland Water Scheme," addressed to A. W. Freeman, clerk to the Council, Maldon, Essex, on or before August 28.

August 29. London, S.E.—*Pulling down the iron building* formerly used as the Guardians' Offices, &c., situate in Brook Street, Kennington Road, S.E., and for the old material therein. Tenders, which will be received only on the printed form, sealed and endorsed "Tender for Old Building," must be delivered at the Guardians' Board Room and Offices, Brook Street, Kennington Road, S.E., not later than 10 o'clock on August 29th and will be opened at the Board Room at noon on the same day, when all persons tendering, or their authorised agents, must be in attendance. The building and specification can be seen, and form of tender can be obtained on application to W. Thurnall, clerk to the Guardians, Guardians' Board Room and Offices, Brook Street, Kennington Road, S.E.

PAINTING AND PLUMBING.

August 24. Manchester.—*Painting the exterior of 150 cottages on the Blackley Estate* for the Sanitary Committee. Specifications may be obtained at the office of the City Architect, Town Hall, upon payment of £1 1s. Sealed tenders, enclosed in the official envelope, to be delivered at the above office not later than 9 a.m, on August 24.

August 24. Sheffield.—*Painting, whitewashing, &c., inside Blocks No. 1, 2 & 3, at the Hospital, Fir Vale*, in accordance with a specification prepared by the clerk of works. Further particulars and a copy of the specification may be obtained by persons proposing to tender, on personal application at the hospital. Fair wages clause. Tenders marked "Hospital Painting," must be sent to A. E. Booker, clerk to the Guardians, Union Offices, Westbar, Sheffield, before 12 o'clock noon on August 24.

August 25. Berwick-on-Tweed.—*Painting certain farm buildings on the Corporation Estate.* For particulars apply to W. J. Bolam, Land Steward's Office, 42, Hide Hill, Berwick-on-Tweed, with whom tenders (to be sealed and marked "Tender for Painting") must be lodged on or before August 25.

August 25. Bangour.—*Painter work of four closed Homes* at Bangour Village Asylum. The relative schedules may be obtained on application to H. J. Blanc, R.S.A., architect, 25, Rutland Square, Edinburgh, where specification and general conditions of contract, &c., will be exhibited. The schedules shall be priced and extended, and lodged with J. Kyd, clerk and treasurer, District Lunacy Board Offices, Castle Terrace, Edinburgh, not later than August 25, at 10 a.m., along with the tender. In the event of the contractor deciding not to tender after receipt of the documents, these are required to be returned.

August 25. Stamford. *Painting and distempering, &c.*, a portion of the Workhouse premises for the Guardians of the Stamford Union, in accordance with plans and specifications, which may be seen at the Workhouse. Sealed tenders must be delivered to R. M. English, clerk, 40, Broad Street, Stamford, not later than 12 noon on August 25.

August 27. Glasgow.—*Cleaning, painting and decorating of Maryhill Public Halls.* Specifications and forms of tender may be obtained on application at the Office of Public Works, City Chambers, 64, Cochrane Street. Sealed tenders, marked outside "Tender for Painting of Maryhill Public Hall," must be lodged with A. W. Myles, town clerk, City Chambers, Glasgow, on or before August 27.

Aug. 29. London, N.E.—*Painting the exterior of the Main Water Tank* at the West Ham Workhouse, situate in Union Road, Leytonstone, N.E. The specification may be inspected at the Clerk's Office at the Workhouse, between the hours of 10 a.m. and 4 p.m., where forms upon which tenders must be made can be obtained. Tenders, sealed and endorsed, "Estimate for Painters' Work," must be received by F. E. Hilleary, Clerk's Office, Union Workhouse, Leytonstone, N.E., not later than August 29. Fair wages clause.

August 30. Wednesfield.—*Painting, colourwashing, &c., at the Cottage Homes, Wednesfield*, for the Wolverhampton Union. Full particulars and forms of specification may be obtained upon application to the Superintendent of the Cottage Homes, Wednesfield. Tenders must be delivered to F. Harrison, clerk to the Guardians' Union Offices, Wolverhampton, not later than 10 o'clock on August 30. Any tender received after that time will not be considered.

August 30. London, E.—*Carrying out certain distempering and painting works* at the Stepney Union, Children's Receiving Home, Barnes Street, Ratcliff, E., their Casual Wards, Eastfield Street, Limehouse, E., and 45, Barnes Street, Ratcliff, E. Specfications and forms of tender, &c., can be obtained on application as below, and such tenders must be delivered to T. G. Stacey, clerk, Guardians' Offices, Barnes Street, Ratcliff, E., on or before 4 o'clock on August 30.

August 30. Chatham. — *Painting at Fire Station and public sanitary convenience, Railway Street, Chatham, and for the construction and supply of specimen cases for the public museum.* Also for the supply of 820 cubic yards 2½-in. surface-picked flints, and fodder, for the six months ending March 25, 1907. Full particulars, specifications, and forms of tender may be obtained, and drawings of the cases seen on application at the Borough Surveyor's Office, Town Hall, Chatham. Tenders, sealed and endorsed with the name of the item tendered for, to be delivered at the Borough Surveyor's Office, Town Hall, Chatham, before 10.30 o'clock a.m. on August 30.

ROADS AND CARTAGE.

August 24. Rhondda.—*Cementing portions of the Llwynypia School playground*, in accordance with the plans and specifications, which may be seen at the office of J. Rees, architect, Hillside, Pentre. Sealed tenders, endorsed "Tender for Cementing Playground," must reach T. W. Berry, director of education, Council Offices, Pentre, Rhondda, not later than the first post on August 24.

August 24. Rhondda.—*Paving, kerbing and channelling*:—1, Hannah Street, Porth; 2, Ynyscynod Road and Partridge Road, Trealaw, for the Urban District Council. Plans may be seen and specification and forms of tender obtained at the Council Offices, Pentre, on depositing the sum of £1 1s. for each section. Fair wages clause. Sealed tenders must be delivered not later than first post on August 24, and addressed to the Chairman of the Council, Council Offices, Pentre.

August 25.—Bromley.—*Supply of field-picked flints, granite, and ragstone of approved quality, and for the carting of gravel* for the Bromley Rural District Council from the date of the execution of the contract to the 30th September, 1907, for the undermentioned Parishes: Chelsfield, Cudham, Downe, Farnborough, Hayes, Keston, Knockholt, Mottingham, North Cray, Orpington, St. Mary Cray, St. Paul's Cray, West Wickham. Separate tenders must be made in respect of each item as separately numbered on the form of tender relating to each parish. Tenders to be delivered to E. Hazlehurst, clerk to the Council, Park House, Bromley, Kent, prepaid not later than 1 o'clock on August 25. Forms of tender may be obtained at the offices of the Council, and no other forms will be accepted.

August 27. Plymouth.—*Making-up and completing, under Section 150 of the Public Health Act, 1875, the following streets and lanes: Eton Place, Section 2: Trelawney Road Lane, East.* Tenders are invited for carrying out the works. Plans and specifications, and conditions upon which forms of tender will be granted, may be seen at the Municipal Offices, Plymouth, J. Paton, Borough engineer, and bills of quantities obtained. Sealed tenders must be delivered at the said offies not later than 5 p.m. on August 27.

Sept. 10. Bishop's Stortford.—*Supply and delivery of a 10-ton steam road-roller* for the Urban District Council. Tenders, accompanied by a complete specification of the roller proposed to be supplied, and stating when it can be delivered, to be sent to T. Swatheridge, clerk, Council Offices, 7, North Street, Bishop's Stortford, by Sept. 10.

SANITARY.

August 24. Birmingham.—*Reconstruction of a length of about 45½yds. of 3-ft. 6-in. brick barrel sewer and about 27yds. of 3-ft. 6-in. by 2-ft. 6-in., egg-shaped sewer, together with manholes, Junction, Bellmouth, and other incidental works*, for the Public Works Committee. The plans and specification may be seen, and quantities and forms of tender obtained, on deposit of a sum of £2. Fair wages clause. Tenders, sealed and endorsed "Sandy Lane Sewer," and addressed to the Chairman of the Public Works Committee, must be delivered to H. E. Stilgoe, City engineer and surveyor, the Council House, Birmingham, not later than August 24.

August 25. Stansted.—*Provision, laying, and jointing about 641 yards of 9-in. stoneware sewer and about 1,254 yards of 6-in., together with all all manholes and lampholes*, for the Rural District Council, in accordance with the plans, sections, and detailed drawings prepared by the Surveyor. Plans and specifications may be seen at the Central Hall, Stansted, Essex, and further particulars to be obtained from E. J. Watts, surveyor, Thorley, Bishop's Stortford. Sealed tenders, endorsed "Stansted Sewers," to be delivered to A. G. Gwynn, Central Offices, North Street, Bishop's Stortford, not later than 12 o'clock noon on August 25.

August 27. Cowdenbeath.—*Additional drainage works* within the Burgh. Plans and sections of the works may be seen, or copies of specifications and schedules of measurement may be obtained at the office of Buchan & Bennett, C.E., 12, Hill Street, Edinburgh; and assistant engineers will meet any intending offerers at Cowdenbeath Railway Station on August 20, at 10.30 a.m., to point out the lines of the proposed Works. Tenders (marked "Additional Drainage Works") are to be lodged with G. Terris. Town clerk, Cowdenbeath, not later than August 27.

August 28. Morecambe. — *Construction of certain intended stoneware and cast-iron pipe sewers* in connection with the sewerage works of the town of Morecambe, for the Borough Town Council, together with manholes, ventilators, connections, and other works, the whole to be let in one contract. Drawings and specification may be seen at the offices of Beesley, Son & Nicholls, MM.Inst.C E., engineers, of 11, Victoria Street, Westminster, S.W., where also specification, bills of quantities, and forms of tender can be obtained on deposit of £5. Copies of the plans and specification may also be seen at Town Hall, Morecambe. Sealed tenders, addressed to W. Tilly, and endorsed "Sewerage Works, Contract No. 3," are to be delivered at the Town Hall, Morecambe, before 10 a.m. on August 28.

August 28. Leatherhead.—*Widening, reforming, kerbing, and providing and laying 1,423 yards of 12-in. and 9-in. stoneware storm-water drain* in connection with the improvement of a portion of Kingston Main road, for the Urban District Council. Also for the providing and laying of about 300 lineal yards of 9in. diam. sewer, with all necessary manholes, &c., in the Oxshott Road. The drawing and draft contract may be seen and copies of the specification, of tenders, and schedules of work obtained at the office of J. E. Smales, engineer and surveyor, Council Offices, Leatherhead, upon the payment of £3 3s. Tenders, sealed and endorsed "Road Improvement." to be sent, addressed to the Clerk of the Leatherhead Urban District Council, on or before 4 p.m. on August 28.

Sept. 5. Whiston.—*Construction of about 17,390 lineal yards of glazed earthenware and cast-iron pipe sewers* varying in diameter from 15ins to 9ins., together with manholes, lampholes, flushing chambers, sewage tanks, and other incidental works for the Rural District Council. The drawings may be seen and copies of the specification and quantities obtained at the office of John T. Wood, M.Inst.C.E., engineer, 3, Cook Street, Liverpool, on the deposit of £5. Sealed tenders, endorsed "Tender for Sewerage Works," to be delivered to A. F. Mann, at the Union Office, Whiston, Prescot, on or before Sept. 5.

September 6. Surbiton, Surrey.—*Construction of main drainage works* for the Urban District Council, subject to the sanction of the Local Government Board. The drawings, specifications, bills of quantities, and forms of tender, may be inspected at the offices of Nicholson-Lailey, M.Inst.C.E., engineer, 53, Victoria Street, Westminster, between 10 a.m. and 5 p.m. (Saturdays excepted), until September 3. Tenders, sealed and endorsed "Surbiton Main Drainage," are to be addressed to F. J. Bell, deputy clerk, Surbiton Urban District Council Offices, Ewell Road, Surbiton, and delivered on September 6 by 12 o'clock noon. A deposit of £10 Bank of England note will be required.

MISCELLANEOUS.

August 28. Fairfield.—*Construction of a Concrete Storage Reservoir* at Turner Lodge, Fairfield, near Buxton, to hold 4,000,000 gallons. Drawings may be seen, and copy of specification, bill of quantities, and form of tender obtained at the Offices of Swann & Brady, engineers, Town Hall, Chapel-en-le-Frith, *viâ* Stockport, on payment of £2 2s. Sealed tenders endorsed "Tender for Reservoir," to be delivered to C. Slater, at the Council Offices, Fairfield, Derbyshire, on or before August 28.

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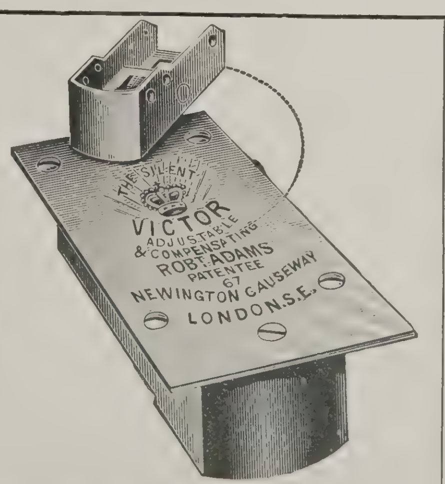

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Bankruptcies.

Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—adjudication.

DURING THE WEEK ending August 17th seventeen failures in the building and timber trades in England and Wales were gazetted.

A. LEVY, builder, Hornsey. Adj. Aug. 10.

H. FOLEY, builder, Reading. R.O., Aug. 10.

G. GUNDEY, plumber, Rotherham. R.O., Aug. 8.

R. E. COLE, contractor, Tottenham. Adj. Aug. 4.

F. SPENCER & SON, builders, Erith. R.O., Aug. 10.

O. ELLIOTT, painter and decorator, Beeston. R.O., Aug. 8.

J. WARD, builder, Stockport. R.O., May 15 (amended notice).

O. ODELL, builder and contractor, Wheathampstead. R O., Aug. 10.

H. ALEXANDER & Co., architects and surveyors, London, E.C. Adj. Aug. 4.

F. RICHARDS, builder, Wolverhampton. Liabilities, £347; deficiency. £54.

G. BARTON, builder, Ashford. P.E., Canterbury Guildhall, Sept. 13, at 10.

G. WILLIAMS, late builder, Blaina. Liabilities, £161; assets, £31; deficiency, £130.

F. A. SIMONS, builders' merchant, Gravelly Hill, Birmingham. Deficiency, £717.

WILKINSON BROTHERS, joiners and builders, Bradford. Gross liabilities, £343; assets, £50.

C. FAIRBANK, builder, Birmingham. Liabilities expected to rank, £1,688; assets, £319; deficiency, £1,369.

R. & G. BRISLEY, builders and contractors, Dover. Liabilities expected to rank, £4,450; deficiency, £3,378.

T. ELLIOTT, house painter, paperhanger and decorator, Newcastle-on-Tyne. P.E., Newcastle C.C., Aug. 23, at 11.

S. Ormerod, builder, Bromley. First meeting, O.R.'s, Leeds, Aug. 22, at 11.30. P.E., Leeds C.C., Aug. 28, at 11.; R.O., Aug. 10.

H. BENNETT, general contractor, Liverpool. First meeting, R.O.'s, Liverpool, Aug. 23, at 11. P.E., Liverpool C.C., Sept. 3, at 11.

P. CARROLL, builder and contractor, Liverpool. First meeting, O.R.'s, Liverpool, Aug. 22, at 2 30. P.E., Liverpool C.C., Sept. 3, at 11.

J. FELL, late builder and contractor, Leamington; now tramway engineer, Westminster. Gross liabilities, £7,300; £3,933 fully secured; assets, £2,914.

W. MANNING, builder, Croydon and Leatherhead. First meeting, 132, York Road, London, S.E., Aug. 23, at 12.30. P.E., Croydon C.C., Oct. 10, at 11. R.O., Aug. 2.

New Companies.

DERBY BRICK CO., LTD., Rowditch, Derby. Capital: £50,000.

MEDWAY CLAY CO., 17, High Street, Rochester. Capital: £3,000.

HOME COUNTIES ELECTRICITY SUPPLY CO., 137, Cannon Street, E.C. Capital: £1,000.

LUSSET LANDS CO., LTD., brick and tile makers, 153, St. Vincent Street, Glasgow. Capital: £10,000

H. R. VAUGHAN & CO., to acquire the business the St. Helens Brickworks, Fylands, Bishop Auckland. Capital: £6,000.

IMPROVED PAVEMENT LIGHT CO., to acquire patents in pavement, floor and road lights, and in prisms used therefor, granted to W. J. Hooks, W. H. C. Hammond, and B. W. Donkin. Capital: £12,000.

FLETTON CROWN AND CROWHURST BRICK CO., LTD., to acquire the assets of the Fletton Crown Brickworks, Ltd., and the London and Brighton Brick, Tile and Terra-Cotta Co., Ltd., and to carry on the business indicated by title. Capital: £31,500.

LOCKERBIE & WILKINSON (Birmingham), to adopt an agreement with R. Duncan, W. D. Green and D. Green, to acquire the business of Lockerbie & Wilkinson, Limited, and to carry on the business of factors of and dealers in iron, brass and metal work, hardware, &c. Capital: £15,000.

MORLEY, FOX & CO., to acquire the business carried on by the trustees of the late W. Morley at the Salopian Works, Fenton, Staffs, as William Morley; to adopt an agreement with Ellen Lloyd and others; and to carry on the business of manufacturers of bricks, tiles, pipes, etc. Capital: £15,000.

J. KIRKALDY & SON, to acquire the business carried on at Garford Street, West India Dock Road, E., and elsewhere, as John Kirkaldy & Son, to adopt an agreement with T. Kirkaldy, and to carry on the business of manufacturers of paint, varnish, anti-corrosive and anti-fouling compositions, &c. Capital: £25,000.

Partnerships.

Dissolutions of Partnerships.

[The date when the partnership was dissolved is given in parenthesis where known.]

APPLETON & MILLER, builders, Colchester (July 13).

THOMPSON & WARREN, painters and decorators, Derby (July 14).

TAYLOR & MOFFAT, builders and contractors, Hightown. Lancs. (July 27).

W. H. COOPER, builder and contractor, Chevington, Suffolk (May 18).

R. VEITCH & SONS, contractors, Newcastle-on-Tyne (June 30). Debts by R. Veitch.

W. VAIL & CO., builders and contractors, St. Albans (June 18). Debts by W. Dorant.

HOLDER & JONES, painters, paperhangers, glaziers, carpenters, &c., Parkstone (June 24).

PEARSON & BURDEN, builders, Wolverhampton (July 28). Debts by H. O. Pearson, who continues.

LEITH. BOLCKOW & CO., iron and steel merchants, Newcastle-on Tyne (June 30). Debts by W. A. Leith.

DICKINSON BROTHERS, painters and decorators, York (July 14). Debts by G. J. Dickinson, who continues with A. Dickinson.

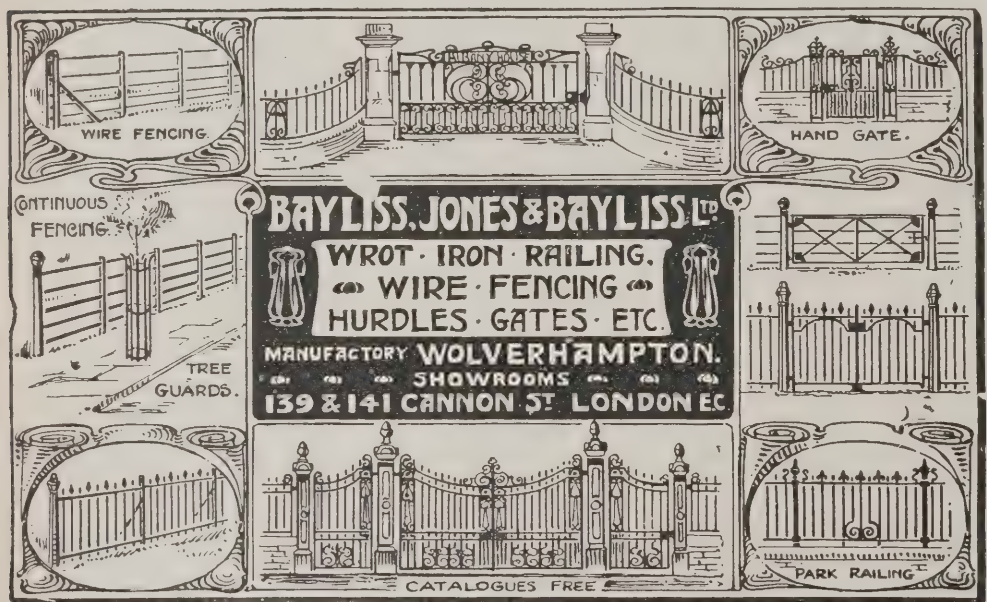
L. H. & R. ROBERTS, builders, Islington (June 30 as regards L. H. Roberts). Debts by R. Roberts and R. L. Roberts, who continue.

ELMORE & SON, builders and contractors, Maidstone (July 9 as regards W. R. Billinness). Debts by T. A. Elmore and E. G. Carpenter, who continue.

TENNANT & BAGLEY, architects and surveyors, Pontefract (July 30). Debts by W. J. Tennant and F. S. Bagley, who continue to practice separately.

A Discovery at Ripon Cathedral.—In the course of certain renovation work on the north side of Ripon Cathedral there has been disclosed what appears to be the foundation of the old Norman cathedral, as the stone exactly corresponds with the stone in the Norman crypt.

A New Castle at Rowallan has been erected from designs by Mr. R. S. Lorimer, of Edinburgh. The stone is of cream colour. The contractors were:—Mason and joiner work, Messrs. Boyd & Forrest, Kilmarnock; plaster work, Stuart's Granolithic Company, Edinburgh; plumber work, Mr. Barton, Edinburgh; painter work, Mr. Duncan, Glasgow; slating, Messrs. R. Graham & Son, Castle Street, Edinburgh; electric lighting, the Alliance Electrical Co., Ltd., 65, Renfield Street, Glasgow.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THE BUILDERS' JOURNAL
AND ARCHITECTURAL ENGINEER.

August 22, 1906.

CONTRACTORS' SUPPLEMENT (MONTHLY).

The Demand from San Francisco. WE have never been particularly optimistic about the opportunities which the San Francisco disaster would give to the English building trades. We have expressed the opinion that, however smart the inhabitants might be, it would be several years before the rebuilding could be concluded, and that the work would be spread over a period which would enable most of the demand to be satisfied by home industry. This opinion is confirmed by the German trade expert in New York, who states that building material, &c., imported from abroad will not enter very largely into the rebuilding of San Francisco, but thinks that just as President Roosevelt refused the monetary assistance proffered from abroad, so will Congress refuse to exempt building materials from import duty. The demand for constructional material, girders, angles, &c., will not be so great as was at first estimated, and supplies will only be required to be brought forward in instalments, which the American iron and steel industry will be able to furnish without difficulty. The more immediate needs—namely, for corrugated iron, wire and nails, &c., for temporary structures—have already been to a large extent satisfied by American concerns. Perhaps a more active demand for fireproof roof and wall coverings and for impregnating material for wood will arise, and bring with it a better chance for the importer. Pressing needs have already been covered, and requirements which will arise with the return to former conditions in the city will be met through the customary channels. The Baltimore fire did not create an abnormal activity in the building materials trade. The demand for Portland cement has, however, already been experienced in this country and in Belgium, as recorded in our special monthly report on the next page. In the opinion of the German trade expert this demand is likely to continue.

Building Accidents. THE recent appointment of a Royal Commission to inquire into accidents in building operations, and the attempt the L.C.C. is making to obtain powers for the control of plant and scaffolding used in the erection of buildings, lends interest to an inquest recently held at the Marylebone Coroner's Court. We would point out that this only shows how accidents are more often than not caused by carelessness on the part of workmen, which legislation can in no wise affect. Of course, accidents do occasionally arise through the use of weak and insecure plant and scaffolding, but it is doubtful if the interference of Government or municipal inspectors would not lead foremen and clerks of works to depend upon these inspectors checking errors, and consequently result in more harm than good. At present, those in charge of building operations know the grave risk of life that may be caused by carelessness, and they consequently pay great attention to the matter. If, however, a lot of bothering and interfering requirements are insisted upon, not only will cost be unnecessarily increased, but, as we suggest, the result may be that there is far less efficiency. The particulars of the case above referred to are as follows:—At the Marylebone Coroner's Court recently an inquest was held on a labourer who died as the result of a fall down a lift shaft. The evidence showed that the deceased, who was in the employment of Messrs. Trollope and Co., builders, of Coleman Street, E.C., was engaged in the rebuilding of Messrs. Debenham and Freebody's premises, Wigmore Street, Cavendish Square. He ascended from the basement to the first floor for the purpose of removing a hose pipe, and whilst doing so the electric lift which was used for the purpose of taking material up and down the buildings descended, striking him on the head. He was knocked down the lift shaft into the basement. The lift attendant admitted that the only signal to give to workmen that the lift was about to move up or down was by his calling out. On Friday he called out as usual, but owing to his having a cold it was possible that his voice did not carry sufficiently far for him to be heard. The jury returned a verdict of "Accidental death," and added a rider calling the attention of Messrs. Trollope & Co. to the fact "that in their opinion the voice signal was not sufficient, and that some other means should be used to give the workmen warning when the lift was about to be used."

Germany and Egypt's Trade. IT will be within the recollection of our readers that some time ago there was an agitation about American firms obtaining contracts for the supply of steel bridges and locomotives to Egypt. It appears, however, that the United States is not our chief competitor in this market. From a recent return, Germany would seem to be much more formidable. The largest proportion of Germany's trade with Egypt is in iron and steel goods, the main branches being rolled steel girders, mild steel bars and hoops and small portable steel rails. In view of the large number of girders imported into Egypt every year, it is to be regretted that England is practically out of the market. The German and Belgian prices considerably undercut English prices, and, in addition, the British standards sections do not suit the market. The following are some of the principal sizes used by builders and contractors in Egypt:—

Height.	Flange.	Web.	Weight per metre.
Millimetres.	Millimetres.	Millimetres.	Kilograms.
80	42 × 42	3.9	6.0
100	50 × 50	4.5	8.3
120	58 × 58	5.1	11.1
140	66 × 66	5.7	14.3
160	74 × 74	6.3	17.9
180	82 × 82	6.9	21.9
200	90 × 90	7.5	26.2
220	98 × 98	8.1	31.0
240	106 × 106	8.7	36.2
260	113 × 113	9.4	41.9
280	119 × 119	10.1	47.9
300	125 × 125	10.8	54.0

The price of the ordinary German rolled steel girders, c.i.f. Alexandria, was, a few weeks ago, about 157·70frs. (£6 4s. 9d.) per ton of 1,000 kilograms. For an order of 2,000 tons, the price is reduced by 1·50frs. (1s. 2d.) a ton. In cast-iron tubing, Germany finds a serious competitor in Belgium, as the latter is able to send over a lighter and cheaper article. Egypt, however, imports large quantities of gas tubes and water piping from Germany, though England has still a good share of this trade. Bar iron from Germany—free on quay Alexandria—costs at present about 166frs. (£6 11s. 4d.) a ton of 1,000 kilos German ironmongery is cheap, and big consignments of tools for carpenters, masons, shoemakers and so on are sent over at very low prices, and, as it is extremely difficult to make the natives understand that a dearer but better made article is the cheaper one in the long run, Birmingham trade has suffered and will suffer in consequence. Cheap locks and hinges of every description, together with nuts, bolts, and window fasteners, all find a good market in Egypt. Speaking generally, the windows in that country are of the French pattern, whilst the doors are also composed of two leaves opening in the centre. The main supplies of hooks and eyes with which they are fitted—in order to keep them open for purposes of ventilation—come from Germany.

The Building Strike at Zurich, one of the longest and most severe that Switzerland has known, has resulted in a complete victory for the masters. After a three months' struggle, which has been a period of great misery for a large number of families, the men have gone back to work unconditionally. The strike has cost the country and the town of Zurich £4,000.

The Emigrants' Information Office desires to warn plumbers intending to go to Canada that information has been received at the Colonial Office to the effect that a strike of plumbers is in progress at Winnipeg, affecting from 175 to 180 men and over thirty establishments. Plumbers intending to go to Canada are advised to communicate with the Emigrants' Information Office, 31 Broadway, Westminster, S.W.

The Month's Trade

Reports by our Special Correspondents.

THE STONE, GRANITE AND MARBLE TRADES.

In these trades some slight improvement has been shown in the past month, except as regards the granite industry, which continued to be very quiet and, if anything, worse than a year ago. The limestone and sandstone quarries were better employed than a month and a year ago. This very small improvement has continued now for a month or two and it appears that the industry may look forward to a gradually improving trade.

The Board of Trade reports for July are as follows:—

Employment in limestone quarries was good, and better than a month and a year ago in Cumberland. It was also good in Weardale, and was fair in South Durham. In the Plymouth district employment was fair generally, and better than a month ago. It continued fair in the Buxton district.

As regards other stone employment was reported as fair, and better than a month ago in the Gateshead district. In the Sheffield, Barnsley and Rotherham district full time was generally worked. Chert quarrymen were well employed in Derbyshire, with much overtime. Employment was fair in the Clee Hill road-material quarries, and moderate in building and limestone quarries in the Rowsley district. It continued bad, with much short time, in Forfarshire.

Employment in granite quarries continued moderate on the whole in Aberdeenshire, but was worse than a year ago. It continued fair in Leicestershire. In Devonshire and Cornwall employment was quiet, but better than a month ago.

Employment with settmakers continued good at Airdrie, Glasgow, Edinburgh and Stoney Stanton, and fair in Aberdeenshire. It was fair, on the whole, in North Wales and in the Clee Hill district. At Rowley Regis it was reported slack through want of stone.

The returns for imports of stones, slabs and marble, rough, hewn and manufactured, for the month of July, 1906, as compared with the same month in 1904 and 1905, are as follows:—

Tons.			Value.		
1904.	1905.	1906.	1904.	1905.	1906.
119,886	110.555	123,053	£136,125	£112,644	£129,118

THE CLAY WORKING INDUSTRY.

We are thankful to be again able to record that the slight improvement noticeable for the last two months continues in the brick and tile trades. Employment, it is true, is still moderate, but it is better than a month ago and a year ago, and it is evident that the trade is at last beginning to revive. The fact that it has been better than last year for the past three months seems to show that the improvement is more than a seasonable one and that the slack time is beginning to pass away and the clay working industry to at last feel the improvement which has been noticeable in various directions in the building trades generally. The districts where things are better are analysed by the Board of Trade, which reports employment as fair on the whole, but that it continued good at Oldham and in South Wales; it was also good in North Wales; in the Tees and Plymouth districts it was fair. In Nottingham, however, employment was slack, short time being worked. At Peterborough an improvement was reported.

THE PORTLAND CEMENT TRADE.

The Portland cement trade continues to prosper. The export trade is flourishing. Altogether there is practically nothing to add this month to our remarks in last month's issue of the "Contractor's Supplement."

The exports for the first seven months have almost reached the yearly totals for 1903, 1904 and 1905. The *Times* recently stated: "Belgium exports annually a considerably larger quantity of cement than Great Britain, the total for 1905 being 679,426 and for 1904 588,295 metric tons. For the first six months of this year the exports amount to 380,556 tons, against 319,770 and 279,154 tons in the corresponding six months of 1905 and 1904 respectively. It is claimed on behalf of the Belgian exporters that by prompt action after the earthquake at San Francisco they secured the lion's share of the newly-created business with that city. But the export figures for the six months to the end of June show that the shipments from Belgium to America fall short of what has been shipped during the same period to the same destination from this country, being 41,332 metric tons, against 49,540 long tons from Great Britain. And whereas the British exports for the six months give an increase over the corresponding six months of last year of 45,735 tons, the Belgian increase on the same comparison is only 16,588 tons. Some estimates, however, place the quantity on order, and yet to be shipped from Belgium during the 12 months ending next March, at about 350,000 tons. The productive capacity of the thirteen syndicated mills in Belgium is about 700,000 tons per annum, and at the present time these mills are turning out a full production. Quite recently, however, producers have shown a disposition to cancel Pacific Coast contracts, fearing that recent heavy shipments will result in a congestion of stocks at San Francisco."

A more comprehensive combine is, it is said, likely to be formed among the Thames and Medway manufacturers with a view to maintaining prices, in order to prevent the industry again relapsing into the condition of depression from which it is now just emerging.

The returns for imports and exports of cement for building and engineering purposes for July, 1906, as compared with the same month in 1904 and 1905 are as follows:—

IMPORTS.

	1904.	1905.	1906.
Tons... ...	22,650	18,435	18,089
Value ...	£32,941	23,436	23,346

EXPORTS.

	1904.	1905.	1906.
Tons... ...	36 147	45,081	60,011
Value ...	£57,327	69,776	90,788

THE SLATE AND TILE TRADES.

Little improvement, if any, in the condition of the slate and tile trades has taken place during the past month. Enquiries for slating are still small in number as well as area, and in the slate trade especially jobs of 100 squares and upwards are still scarce.

Trade in the Northern Counties and North Midlands is fairly good, as also it appears to be in Ireland, but in the London and Home Counties complaints of slackness are general. This does not appear to be confined to general contracts, but applies also to speculative building, and in the latter branch of the trade most of the estates have been built on somewhat in advance of requirements, and operations are being curtailed in consequence.

The wall and floor-tile branch of the trade is in a stagnant condition, and prices extremely low and quite unremunerative.

The slate slab trade is particularly quiet; this is largely accounted for by the general use of earthenware for sanitary purposes, and of late the use of slate as partitions for slipper baths has fallen off in favour of teak and marble. Another important branch—namely, the brewing trade—has been stagnant, and inquiries are very rare.

The slate trade in Wales is gradually improving and it is hoped that stocks may be considerably reduced by the end of the year. Short time is still being worked in some of the districts, and the supply will in the future be regulated. so far as possible, to meet the demand.

The low price of Welsh slates has somewhat curtailed the import of foreign slates.

The quarries in Westmorland report a general quietness in the London area, all the trade in these slates is apparently being done in the north. They are badly wanting a few large contracts, such as the City Hall, Belfast.

The Board of Trade returns show that employment in July in North Wales continued slack generally, though a slight improvement was reported at certain quarries; there was some short time in the Festiniog district. Employment continued quiet in the Ballachulish (Argyllshire) quarries, where only five days a week were worked.

In our last issue we referred to two varieties of foreign green slates which retain their colour well. We have not space to deal with all the varieties on the market, but we would, however, refer to another excellent variety—namely, the "Arfon" unfading green slates. These have been on the English market for 10 years, and are largely favoured by architects, which proves that they are far removed from the category of those inferior slates to which we have referred in previous reports in these columns. The "Arfon" slates come from the United States, and the quality may be depended upon owing to the careful supervision of the slates exported. In addition to the unfading green variety of "Arfon" slates, blue and terra-cotta red varieties are supplied. In all three colours slates are supplied in the usual Welsh sizes—namely, from 26ins. by 14ins. to 10ins. by 6ins. The English agents, Messrs. Pearson Brothers & Campbell, of 18, Water Street, Liverpool, keep a large stock on hand. The green variety is of a beautiful soft greenish grey tone.

Trade in the Broseley district is still dull, and but for the number of schools now being erected in the country times would be very dull. The Broseley trade in the South of England has doubtless suffered owing to the large number of machine-made pressed tiles now being produced. Nearly all the large makers in Sussex and Hampshire now make these, and they are selling freely and, doubtless, at remunerative rates, as the cost of carriage is low compared with that from the Broseley districts.

The Sussex tile trade is fairly good and building contracts more numerous, schools again being numerous.

There has been a demand of late for green glazed roofing tiles, similar to those used on the Savoy Hotel. The supply of these hitherto has been somewhat fitful, but users of these will be glad to hear that in future a stock will always be available in London sufficient for an area of 200 squares, and reasonable notice will ensure a supply of any quantity in excess of these. It may not be generally known that the cost of fixing these is somewhat in excess of the cost of the tiles, and consequently are the most expensive of any tile roof covering. It is possible to obtain green glazed roofing tiles of the usual shape with due notice, and the samples of these produced can be varied in colour to suit requirements; the cost of these is about four times that of ordinary roofing tiles.

THE TIMBER TRADE.

The Board of Trade reports that during July employment with millsawyers and woodcutting machinists was moderate on the whole. Trade Unions with a membership of 4,397 reported 188 (or 4·3 per cent.) as unemployed at the end of July, the same percentage as at the end of June. The percentage for July, 1905, was 5·1. Employment was reported as good at Birmingham and Edinburgh, and as dull in London.

Messrs. C. Leary & Co. in their mid-monthly report state that the imports of mahogany during the first half of this month have been on a very small scale, consisting for the most part of Cuba. The position consequently continues strongly in sellers' favour. Fresh supplies are much needed and early arrivals would meet with a ready sale at full rates. Cargo quotations are as follows:—Tobasco 3½d. to 6d., Minatitlan and Tecolutla 3½d. to 4½d., Guatemalan 4d. to 5½d., Honduras 4½d. to 6½d., Nicaraguan 3½d. to 6d., Costa Rican 3½d. to 5d., Panama 3½d. to 4½d., Axim, &c., 3½d. to 5d., Lagos 3½d. to 5d., Benin 4d. to 5d., Niger 3½d. to 4½d., Gaboon 2d., Cuba 4½d. to 6½d., St. Domingo and Jamaican 4d. to 5½d. per foot.

This firm also reports that there have been no arrivals in regard to cedar, and the market is again bare of stock and would absorb considerable quantities at full rates, as there is a strong and well sustained inquiry. Quotations in parcel are as follows:—Mexican 4½d. to 6½d., Honduras 4½d. to 7d., Panama 3d. to 5d., Costa Rican 3½d. to 5d., Cuba 4½d. to 6½d., Trinidad 4d. to 5d., Paraguay 2½d. to 4d. per foot.

A notification has been received from the India Office that tenders will shortly be invited for the purchase on a long lease of valuable timber standing in the north and middle Andaman Islands. The estimated amount of timber to be removed is as follows: Red Padauk, about 10,000 to 12,000 tons annually. Koko, about 500 tons annually. Gurjan, about the same quantity as Padauk. Pynima, about 200 to 300 tons annually. White Chuglam, about 600 to 800 tons annually. Black Chuglam, about 400 tons annually. In addition to the above there are several other less valuable timbers available in varying quantities. All the above timbers float in sea water, and the cost of extraction from forest to harbour is estimated at from Rs.14 to Rs.16 per ton. No labour is available in the island, but it may be imported from Madras at a moderate cost. Further information may be obtained by direct application to the Inspector-General of Forests to the Government of India, Simla.

THE PAINT TRADES.

The paint trades continue fair. As regards materials, the returns for imports and exports for July, 1906, as compared with the same month in 1904 and 1905, are as follows:—

Imports.

	Cwts.			Value.		
	1904.	1905.	1906.	1904.	1905.	1906.
White lead	27,032	24,912	26,729	£21,438	20,001	24,707
Zinc oxide	133,166	25,528	22,925	909,042	142,927	166,262
Other colours and pigments		111,186	151,835		864,405	920,164
Turpentine	84,521	36,864	62,202	160,107	65,724	126,047
Lac-dye, seedlac, shellac and sticklac	9,287	7,772	5,581	93,651	53,730	52,650
		Tons.				
Linseed oil	214	717	885	2,537	13,950	18,133

Exports.

		Cwts.				
White lead	26,227	24,067	36,424	24,961	23,048	39,608
Zinc oxide	98,178	5,490	5,951	121,283	6,357	7,071
Other colours and pigments		118,762	140,539		146,560	180,685
		Tons.				
Linseed oil	2,356	2,211	2,234	43,455	45,198	52,407

THE GLASS TRADE.

The glass trade continues fair. The Board of Trade reports that employment in July continued moderate, but was better than a month ago and a year ago. Employment continued good with sheet-glass makers and flatteners at St. Helens. It was fair with glass blowers in London and with plate-glass bevellers at Birmingham.

The returns for imports and exports of glass for the month of July, 1906, as compared with the same month in 1904 and 1905, are as follows:—

Imports.

	Cwts.			Value.		
	1904.	1905.	1906.	1904.	1905.	1906.
Window and German Sheet, including shades and cylinders	71,856	97,604	93,171	£43,416	56,995	51,946
Plate	48,667	35,671	40,269	55,905	42,344	52,892

Exports.

Plate	5,051	12,534	10,986	7,638	16,891	16,233

THE IRON AND STEEL TRADES.

Recent Progress.

Neither in prices nor in tonnage have the past few weeks placed anything on record to realise the hopes that had been entertained for the opening of the half-year.

In fact, throughout the whole range of the home markets the prevailing tone has been one of flatness and mediocrity. Here and there makers and merchants have made obstinate efforts to maintain prices at normal level, but in several lines there have been instances of distinct falling off.

In Birmingham the general outlook was conspicuously disappointing. The reduction in the price of marked iron bars, to which we referred in the last issue of the "Contractors' Supplement," caused no appreciable increase in demand. As a natural consequence, the price of common iron bars touched a lower level than has been reported for some time past, and although sales were not heavy there were offers on the market at £6 5s. per ton and thereabouts.

Corrugated sheets found a very brisk demand. The increased figure of the association was well maintained, and in many cases exceeded. Good business was done at £12 12s. 6d., and in odd cases at £12 15s. per ton. This is the one line, perhaps, in which the prices of the present year have shown a steady and consistent advance throughout.

Considerable business was done in rolled steel joists, angles and tees at comparatively good figures. Marked iron bars were quoted at £8 10s.; angles at £6 12s. 6d. to £6 15s.; joists at £6 17s. 6d. to £7 2s. 6d., and girder plates at about £7 10s., all per ton.

Structural steel also showed a slight improvement in Lancashire, where a considerable amount of work has been in progress.

In Scotland the position all round remained practically unchanged, although a certain firmness was given to prices of rolled steel shapes through the absence of any appreciable competition from Germany. Iron angles maintained their figure of £7 2s. 6d.; bars, £7; whilst steel bars changed hands at £6 17s. 6d. to £7, and angles at £7 17s. 6d. to £8, all per ton.

In Continental material the situation showed no signs of weakening. As a matter of fact, the majority of makers of structural steel shapes were busier than ever in their efforts to cope with the home demand. In rolled steel joists there was but small demand on this side. Prices did not not alter in any material degree, merchants quoting on the basis of £6 2s. 6d. and thereabouts for delivery ex steamer Thames. The time of dispatch, of course, always varies according to the nature of the specification, but few merchants seemed inclined to promise anything better than about ten weeks for delivery on this side of an ordinary lot of German standard sections. This has militated considerably against the market so far as British consumers are concerned, as makers on this side can offer a much more expeditious fulfilment of orders.

The Present Position.

It may reasonably be accepted as a sign of the times that several leading steel makers announce largely increased profits in their statements of account for the past half-year, and seem to be unanimous in anticipating a similar happy result for the current half-year. So far as structural steel is concerned, pig-iron prices are not a very good index to follow, but where a consistent upward movement takes place in the latter, apart from the daily fluctuations, it is fairly safe to assume that the price of manufactured steel will in due course follow suit. In Scotland, Cleveland and Staffordshire the tendency in pig-iron has been very strong, and at the same time there has been an agreeable firmness in the prices quoted for manufactured steel. There have been no advances in structural steel shapes, but all round prices have been well maintained and the outlook is distinctly hopeful. The following are a few representative figures in lines which affect the building trades:—

Iron and Steel Prices (per ton).

	£	s.	d.
Marked iron bars, Staffs.	8	10	0
Steel joists ,,	7	0	0
,, girder plates ,,	7	10	0
,, angles ,,	6	12	6
Common iron bars ,,	6	5	0
Gas tube strip ,,	6	10	0
Galvanised sheets ,,	12	12	6
Steel angles, Cleveland	6	12	6
Iron angles ,,	7	2	6
Common iron bars, Cleveland	7	5	0
Steel joists ,,	6	5	0
,, plates ,,	7	17	6
Best iron bars, Lancs.	7	10	0
Iron angles ,,	7	5	0
Iron angles, Scotland	7	2	6
Common iron bars, Scotland	7	2	6
Best iron bars ,,	7	7	6
Steel angles ,,	7	0	0
,, bars ,,	7	17	6

The increased briskness in demand during the past week or two, particularly in structural steel, has been most marked in the Cleveland district, where a very good volume of business has been done. As will be observed from the foregoing list, prices are very much the same as they have been for the past three months, but there is every indication that an early increase may be looked for. It is also important to note that whilst the nominal figures have remained practically stationary during this period, there has hitherto been considerable undercutting by various merchants and makers, whereas at present all sellers are more inclined to toe the line.

In Scotland also there is a marked briskness in raw iron, but this has not yet extended to structural steel. At the same time, a fair and improving demand is reported in steel joists and in lighter rolled shapes, and makers have so far been successful in keeping prices firm. Fresh contracts are being entered into at current prices, which furnishes good evidence that buyers do not anticipate a slackening off in the near future. There is a fair amount of work in progress, and the outlook is better than it has been for some weeks past

The half-year has progressed without any marked change having taken place in the market with regard to Continental structural steel. The following are a few current prices in Continental steel, which include freight for the Thames, east coast ports, and places a moderate distance inland:—

Continental Steel Prices (per ton).

	£	s.	d.
Steel Joists	£6	3	6
Steel Channels	6	7	6
Iron Rods	7	4	6
Steel Angles	6	7	6
Steel Tees	6	10	0
Steel Plates	6	17	6
Steel Rods	7	7	6
Square Steel Bars	6	7	6

The prices given are for ordinary specifications of 10 tons and upwards. Deliveries continue to be very slow, occupying some nine or ten weeks. It is quite within the bounds of possibility that the next few weeks may see advances upon some of the foregoing figures, and this circumstance, coupled with the consideration of time, will still further prejudice business in the eyes of the British consumer.

OTHER METALS.

The copper market has shown a considerable access of strength latterly. Price fluctuations have been comparatively small, and demand in this country has improved with the approach of autumn. Standard copper is now quoted at about £84 per ton, and there is every prospect of advances upon this figure. American supplies are running short, and the "Amalgamated" are committed for large quantities over the next month or two. Electrolytic is quoted at £88, and strong sheets at £97 per ton. So far as can be seen at present, there is no likelihood of anything but increases upon these figures for some time to come, as both in America and this country there is every indication of improved demand from all consuming industries.

Lead has also shown considerable strength during the past few weeks, and there are strong prospects of continued briskness. Present prices are as follows: English, £17 10s.; Soft Foreign, £17; Pipes, £20; Sheets, £19 15s., all per ton and for home markets.

The tin market has pulled round lately to a remarkable extent, although at the immediate present it is suffering a slight relapse. The current price for the Straits metal is £182, and for English £180 per ton.

THE IRONMONGERY TRADE.

The Board of Trade returns for July show that employment at Wolverhampton in the lock and latch trades continued bad, short time being general. With makers of hollow-ware it continued good. Employment with hollow-ware makers continued slack at Sheffield; at Birmingham it was moderate; at West Bromwich it was quiet.

Employment in the stoves, grates, &c., trades was fair at Glasgow and Falkirk; moderate in Suffolk and Essex; slack at Rotherham, and bad at Leicester, and also at Leeds, where short time was worked.

With nut and bolt makers employment was good at Winlaton and in South Wales, where some overtime was worked; at Darlaston it continued good. With cut nail and rivet makers it continued fair at Birmingham. At Blackheath employment with rivet makers was quiet, and fair with nail makers.

Employment in the wire trade continued good in the important centres. With wire weavers in Glasgow it remained dull.

THE WALLPAPER TRADE.

The wallpaper trade shows little or no movement. The Board of Trade returns of exports and imports for the seven months of this year ending July 31st show that paper hangings to the value of £99,282 were imported this year as against £80,955 worth last year; the exports are valued at £141,639 in 1906, as against £133,980 in 1905 and £139,768 in 1904.

The following is the return of paper-hangings for July:—

	1904.	1905.	1906.
IMPORTS.			
Cwts.... ...	—	2,664	2.300
Value... ...	—	£7,443	6,986
EXPORTS.			
Cwts.... ...	5,286	6,522	9,453
Value... ...	£12,377	13,999	20.459

That big combination Wallpaper Manufacturers Limited have been threatened with competition, but since the flotation of the combination, in the summer of 1899, only two companies have been started to manufacture wallpapers in opposition, and neither of these has, as yet, attained any degree of magnitude. The larger of the two concerns has now been acquired by the combine, namely Messrs. Page, Arnold and Co. Ltd., of Holmfield Mills, Halifax (Yorks) and London. Among the directors of the Halifax Company is Mr. G. E. A. Line, who is a member of the well-known firm of John Line's, Sons, and McDougall, wallpaper merchants of London, Manchester and elsewhere.

The Labour Market

Board of Trade Returns for July.

The Board of Trade returns show that employment in the building trades in July continued dull on the whole, though it was slightly better than a month ago. Compared with a year ago it showed little change.

In London

employment was rather better than a month ago, but it was not so good as in July, 1905. Returns received from 57 London employers show that in the last week of July 9,993 workpeople of all classes were paid wages, as compared with 9,556 in June, and 11,441 in July, 1905.

Trade Union returns relating to carpenters and joiners show that the percentage of unemployed in July was 7·8 as compared with 9·4 a month ago, and 7·9 a year ago. With plumbers the percentage for July was 14·3, for June 13·7, and for July 1905, 11·1. In both trades the percentage of unemployed was higher in London than in any other district. With bricklayers and plasterers employment was rather better than in the previous month; with masons a considerable improvement was shown, though employment continued dull, and with painters little change was shown.

The Provinces.

Returns received from 72 Employers' Associations in towns outside London show that employment in these towns continued quiet, and, on the whole, rather worse than a year ago.

The trade unions report, however: Employment with bricklayers and masons was dull on the whole, but somewhat better than a month ago. With carpenters and joiners it continued slack, but was slightly better than a month ago and a year ago.

In the Northern Counties

employment was quiet on the whole, and about the same as a month and a year ago. With painters a falling off was reported; with slaters and tilers short time was general in the Tyne district.

In Yorkshire

employment generally continued quiet. In Sheffield, however, it was slightly better than a month ago.

In Lancashire and Cheshire

employment continued fair. With bricklayers and masons it was rather better, but in other branches, especially with painters, there was a falling off.

As regards the Midlands and Eastern Counties

in Derbyshire employment was slack; in Leicestershire it was quiet; in Nottingham it was moderate. In the Eastern counties employment was slack generally.

In the Southern and South-Western Counties

employment continued quiet in the Three Towns district and in South Wales. There was a slight improvement at Bristol.

In Scotland

employment was moderate generally. In the Clyde district it was rather better than a month ago with bricklayers and joiners; with plasterers and painters it was worse.

In Ireland

at Belfast and Dublin employment was fair generally. At Cork it was fairly good, and better than a month ago.

Current Rates of Wages in Large Centres.

Towns.	Masons.	Bricklayers.	Carpenters and Joiners.	Plasterers.	Slaters.	Plumbers.	Painters.	Labourers.
	d.	d.	d.	d.	d.	d.	d.	d.
Aberdeen	8	—	8	8	8	8	8	4½–5½
Accrington	9	9	8½	9	7½	8½	—	5–5½
Ashton-under-Lyne	9½	10	9	10	8½	9'	8	5½–6½
Barnsley	9	9	8½	9	8½	8	8	6½
Barrow-in-Furness	9	9	8¾	9	9	8¼	8¼	6–6½
Bath	7½	7½	7½	7½	7½	6½	6½	5–5½
Belfast	8½	8½	8½	8¾	8	7½ 8½	8	19s.wk
Birkenhead	9½–10	9½	9½	9½	9	9½	8½	5–6½
Birmingham	10–10¾	9½	9½	10	9	9½	8½	6½–7
Blackburn	9½	10	9	9	9	9	8	5½–6½
Blackpool	9¾	9½	8½	9½	8½	9	8½	5½–6
Bolton	9½	10	9½	10½	9	9	8½	6½–7
Bournemouth	8½	8	8	8	8	8	7½	5½
Bradord	9	9	8½	8½	9	9	8	6–6½
Brighton	9	8	8	8	8	9	7	5½
Bristol	9	9	9	9	9	9	8½	6–6½
Burnley	—	—	8½	—	—	—	—	—
Burton-on-Trent	8½	8½	8½	—	—	—	—	5¾–6
Bury	9½	10	9½	9	9	9	8½	5–6½
Cambridge	8½	8	8	8½	8	8½	6½	5–5½
Cardiff	9	9	9	9	9	9	8½	5½
Carlisle	8½	8½	8	8	9	8	8	5–5½
Chatham	9	9	8½	9	10	8½	7	5½
Cheltenham	8–8½	8	8	7¾	—	8	7½	5
Chester	9	9	8½	9	9	8½	7½	5–5¾
Coatbridge and Airdrie	9½	9½	9	9½	9	8½	9	6
Colchester	8	8	8	9	8	9	6 6½	5–5½
Cork	7⅔	7⅔	7⅔	7⅔	7⅔	8	8	3⅗
Coventry	9¼	8¾	9	8¾	8¾	9	8	6
Crewe	8½	8	7	9	8	8	7	5
Darlington	9	9	8½	9	9½	8	7½	6
Darwen	9½	9½	9	9	9	9	8¼	6
Derby	9	9	8½	9	9	8½	7½	5½–6
Dublin	8–8½	8½	8–8½	8	8	8½	7½	4¼–4½
Dudley	8½	8	8	8½	8½	9	7	5½
Dundee	8–8½	10	9	8½	8½	8½	8½	5¼–5½
Eastbourne	8½	8	8	9	pce.	8	7½	5½
Edinburgh	8½	9½	9	—	—	9	—	—
Exeter	8	8	7½	7½	7½	7½	6½	5
Glasgow	—	9½	9½	9½	9	9	9	5½–6
Gloucester	7½	8	8	7½	7½	8	7½	5
Greenock	9½	10	9	9½	9½	9	9	5½
Grimsby	—	9	8	9	pce	—	7½	6–7
Halifax	9	9	8¼	8½	8½	8½	7½	6
Hartlepools	9½–10	10	9¼	9½	—	—	—	7–7½
Hastings and St. Leonards.	8	8	8	8	—	8	7	5½–6
Huddersfield	9	9	11	8½	9	7½ 8	7½	6
Hull	9¼–9¾	9	9	9	9	9	8	6½–7
Ipswich	8	8	8	9	9	8	7½	5–5½
Keighley	8½	8½	8	7½	8½	7½	7½	6
Lancaster	9½	10	8½	9	9	8	8½	5½–6
Leeds	9½	9½	9½	9	8½	9	8	6½–7
Leicester	9	9	9	10	9	9	8	6–6½
Leigh	9½	9½	9½	9	8½	9	8	6–6½
Lincoln	8½	8	8	9	8	8	7½	5–6
Liverpool	9½–10	9½	9½	9½	9½	9½	8½	5–6
London	10½	10½	10½	11	—	11	—	—
Londonderry	7	7	7	7	6½	7	7½	15s.wk.
Macclesfield	8	8	8	7¾	6½	7½	7½	5
Manchester	9½–10	10	9½	10	9	9½	8¾	5½–7
Merthyr Tydfil	8½	8½	8	8½	8	8	7½	5½
Middlesbrough	9	9½	9¼	9½	9½	9	8	6¼–6¾
Newcastle	9½	9	9½	9½	9½	9	8½	6
Newport(Mon.)	8½	8½	7½	8½	8½	8½	7½ 8	5½
Northampton	8½	8½	8½	8½	—	8½	7½ 8	5½
North Shields	10	10	10	10½	9½	8¼	9	6½–7
Norwich	8	8	8	8	7½	8	6½	5
Nottingham	9½	9	9	10	9	9	8½	6½–7
Oldham	9½	10	9½	9	8½	9	8½	5½–7
Oxford	8½	8	8	8	8	8	7	5½
Paisley	9	9½	9	9	9	9½	9	6
Perth	8	10	8	8	8	8	7½	5½–6
Plymouth	8	8	8	8	8	8	7	5
Portsmouth	8½	8½	8	8½	pce.	7½	6½ 7	6
Preston	9½	10	9	8½	8½	8½	8½	5½–6
Rochdale	9½	10	9	9	8¼	9	8½	5½–6½
Rotherham	9½	9½	8½	8½	8	8½	7½	6
St. Helens	9	9	9	9	9	8½	8¼	5½–6
Scarborough	8½	8½	8	8¼	33s. wk.	8	7½	6
Sheffield	9½	9½	9	9	9	9	7½	5½–6½
Southampton	7½	8	8	8	pce	8	7	5
Southport	9	9	8¾	9	9	9	8½	6
South Shields	9½	—	9½	—	9½	8½–1/16	9	6
Stockport	9½	9½	9	10	8½	8½	8	4¼–7
Stockton-on-Tees	9	9½	9¼	9½	9½	9	8	6¼–6½
Sunderland	9½	10	9¼	10	10	8½	9	6½–7
Swansea	8½	—	8½	8½	—	8½	7½	5½
Torquay	7	7	7½	7	7	7	7	4½–5
Wakefield	9	8½	8	8½	8	7½	7½	6
Walsall	9	8½	8½	8½	8½	8½	7	5¾–6½
Warrington	8¾	9¼	9¼	9½	8½	9¼	8	5½–6½
West Bromwich	9½–10	9	8½	9	pce.	8¼	7	6–6½
Wigan	9½	10	9	9	8½	9	8½	5½–7
Wolverhampton	9	9	9	8½	8½	9	7½	6–6½
Worcester	8½	8½	8½	8½	8½	8½	7	5½
Yarmouth	7	7½	7½	A	7½	5½–7	6	4–4½

A. Done by bricklayer.

Current Market Prices.

FORAGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	14	0	1	16	0
Clover, best	per load	4	4	0	4	15	0
Hay, good	do.	3	17	6	4	2	6
Sainfoin mixture	do.	4	0	0	4	7	6
Straw	do.	1	8	0	1	14	0

MISCELLANEOUS.

		£	s.	d.	£	s.	d.
Bricks Stocks, d/d to job	per 1,000	1	15	0		—	
Do. Flettons on rail	do.	1	5	0		—	
Do. Pressed Wire Cuts, d/d to job	do.	1	17	0		—	
Do. Blue brindled wire cuts	do.	1	2	0		—	
Do. do. wire cuts	do.	1	6	0		—	
Do. do. pressed facings	do.	1	17	6		—	
Coke Breeze, into carts at gasworks	per load	0	2	0		—	
Do. d/d to job	do.	0	4	0		—	
Sand	per yard	0	7	6		—	
Ballast	do.	0	6	6		—	
Granite Chippings	do.	0	10	6		—	
Do. do. ¼in.	do.	0	11	6		—	
Do. Broken, 1½in.	do.	0	15	6		—	
Do. do. 2in.	do.	0	15	0		—	
Do. do. 2½in	do.	0	14	6		—	
Do. Kerb, Norwegian 6×12 and 12×6 in river	per foot	0	1	2		—	
Do. do. do. circular	do.	0	1	5		—	
Do. do. do. 12×8 in river	do.	0	1	5		—	
Do. do. do. circular	do.	0	1	8		—	
Do. do. Guernsey 6×12 in river	do.	0	1	4		—	
Do. do. do. circular	do.	0	1	6		—	
Do. do. do. 12×6 do.	do.	0	1	6		—	
Do. do. do. do.	do.	0	1	8		—	
Do. do. do. 18×8 do.	do.	0	1	8		—	
Do. do. do. do.	do.	0	1	10		—	
Do. Pitchings, Norwegian, 3×6	per ton	1	8	0		—	
Do. do. do. 3×7	do.	1	10	0		—	
Do. do. do. 3×5	do.	1	9	0		—	
Do. do. do. 4×5	do.	1	8	0		—	
Do. do do. 4×4	do.	1	13	0		—	
Do. do. do. 4×6	do.	1	5	0		—	
Do. do. do. 5×6	do.	1	4	0		—	
Do, do. do. 5×7	do.	1	4	0		—	
Do. do. do. Special, 4×6	do.	1	11	0		—	
Do. do. do. do. 5×7	do.	1	18	0		—	
Do. do. Guernsey, 3×6	do.	1	10	0		—	
Do. do. do. 3×7 & 3×9	do.	1	8	6		—	
Do. do. do. 3×5	do.	1	10	0		—	
Do. do. do. 4×5	do.	1	10	0		—	
Granite, Pitchings, Guernsey, 4×4	do.	1	13	0		—	
Do. do. do. 4×6	do.	1	9	0		—	
Do. do. do. 4×7	do.	1	6	6		—	
Do. do. do. 5×6	do.	1	6	0		—	
Do. do. do. 5×7	do.	1	5	0		—	
Do. do. Specials add.	do.	0	6	0		—	
Glass, English Sheet, in crates of stock sizes, 15oz., 2nds	per sq. ft.	0	0	3½		—	
Do. do. do. do. 3rds.	do.	0	0	2½		—	
Do. do. do. 21 oz. 2nds	do.	0	0	5		—	
Do. do. do. do. 3rds	do.	0	0	3½		—	
Do. do. do. 26 oz. 2nds	do.	0	0	6		—	
Do. do. do. do. 3rds	do.	0	0	4¼		—	
Do. do. do. 32 oz. 2nds	do.	0	0	8		—	
Do. do. do. do. 3rds	do.	0	0	6		—	
Do. English patent plain rolled plate in stock crates ⅛	do.	0	0	2		—	
Do. do. do. 3/16	do.	0	0	2¼		—	
Do. do. do. ¼	do.	0	0	2½		—	
Do. Atter (Abo.) do. & White, Inf. 5th, 3×8	do.	8	10	0		—	
Do. do. (do.) Yellow, unsorted, 3×9	do.	9	10	0		—	
Do. Constantza, White, 3rd, 3×11	do.	9	10	0		—	
Cement	per ton	1	12	0		—	
Lime	do.	1	4	0		—	
Castor Oil, French	per cwt.	1	10	0	1	2	0
Colza Oil, English	do.	1	9	0		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	15	0	2	17	0
Lead, white, ground, carbonate	per ton	16	0	0		—	
Do. red	do.	15	0	0	19	0	0
Linseed Oil, barrels	per cwt.	1	0	4½		—	
Petroleum, American	per gal.	0	0	6⅜	0	0	6½
Do. Russian	do.	0	0	5⅝	0	0	6
Pitch	per barrel	0	9	0		—	
Shellac, orange	per cwt.	10	15	0	10	16	0
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Town	per cwt.	1	7	6	1	8	6
Tar, Stockholm	per barrel	1	5	0		—	
Turpentine	per cwt.	2	5	0		—	

METALS.

		£	s.	d.	£	s.	d.
Standard Copper	per ton	83	10	0	84	0	0
Do. Strong sheets	do.	96	10	0	97	0	0
Lead, soft foreign	do.	16	15	0	17	0	0
Do. English	do.	17	0	0	17	10	0
Do. pipes	do.	20	0	0	20	10	0
Do. sheets	do.	19	10	0	20	0	0
Galvanised Corrugated sheets	per ton	12	10	0	12	15	0
Spelter G.M.	do.	26	10	0	27	0	0
Angles, Scotland	do.	6	17	6	7	0	0
Bars, do.	do.	7	15	0	8	0	0
Marked bars, Staffs.	do.	8	10	0	8	12	6
Common bars, do.	do.	6	5	0	6	10	0
Angles, M'boro.	do.	6	10	0	6	12	6
Joists do.	do.	6	2	6	6	5	0
Angles, Midlands	do.	6	10	0	6	12	6
Joists do.	do.	6	15	0	7	0	0
Girder plates, Midlands	do.	7	7	6	7	10	0
Angles, Foreign, c.i.f. Thames	do.	6	7	6	6	10	0
Tees do. do. do.	do.	6	10	0	6	12	6
Joists, do. do. do.	do.	6	2	6	6	4	0
Channels do. do. do.	do.	6	7	6	6	8	6
Plates do. do. do.	do.	6	17	6	7	2	6
Tin, Foreign	do.	182	0	0	183	0	0
Do. English ingots	do.	180	0	0	182	0	0
Zinc, sheets, Silesian	do.	27	0	0	27	10	0

TIMBER.

Soft Woods.

		£	s.	d.	£	s.	d.
Fir, Dantzic and Memel	per load	2	15	0	4	15	0
Pine, Quebec, Yellow	do.	3	15	0	6	15	0
Do. Pitch, American	do.	3	12	0	5	0	0
Laths, log, Dantzic	per cu. fath.	4	0	0	6	0	0
Deals, Abo (Harildsby), Yellow, unsorted, 2½×7	per std.	9	15	0	10	0	0
Do. Mesane, Yellow, 3rd, 3×9	do.	11	10	0		—	
Do. do. do. do. 3×8	do.	10	10	0		—	
Do. St. Petersburg, Yellow, 1st, 3×9	do.	12	15	0		—	
Do. do. do. 3rd, 2½×7	do.	9	5	0		—	
Battens, Abo (Harildsby), Yellow, unsorted, 2×4	do.	10	0	0		—	
Do. Fredriksstad, Yellow, unsorted, 1×9	do.	10	5	0		—	
Do. Gefle, Yellow, planed, 1st, 2×4	do.	10	5	0		—	
Do. do. do. do. ¾×9	do.	12	0	0		—	
Do. do. do. 2nd, 2×4	do.	10	0	0		—	
Do. do. do. do. 1½×11	do.	10	15	0		—	
Do. Ljusne, Yellow, 4th, 2×7	do.	10	0	0		—	
Do. Mesane, Yellow, 4th, 2×9	do.	10	0	0		—	
Do. Norrkoping Yellow, 1st and 2nd, 2½×6	do.	8	5	0		—	
Do. St. Petersburg, White, 3rd, 2×6½	do.	8	10	0		—	
Do. do. do. do, 2×6	do.	8	15	0		—	
Do. Yellow, 3rd, 2×6	do.	9	0	0		—	
Do. Sando, White, 1st and 2nd, 2×4	do.	9	0	0	9	5	0
Do. Skutskav, White, planed, do. 1¼×11	do.	11	10	0		—	
Do. Sundswall, Yellow and White, planed, 1×9	do.	6	15	0		—	
Do. Sandarne, White, planed, 1st, 1×9	do.	10	15	0	11	0	0
Flooring Boards, Domsjo, Yellow, 1st, 1¼×7	do.	0	15	6		—	
Do. do. do. do. 1¼×6	do.	0	14	6		—	
Do. do. do. do. 1×7	do.	0	12	6		—	
Do. do. do. 3rd, 1¼×7	do.	0	12	6		—	
Do. Mo, do. 2nd, 1¼×6	do.	0	13	9		—	
Do. do. do. do. ⅞×6	do.	0	9	6		—	
Do. Johannedal, do. 1st & 2nd, 1¼×6	do.	0	14	0		—	
Do. do. do. do. 1×6	do.	0	11	3		—	
Do. Sikea do.	do.	0	8	3		—	
Do. Fredriksstad, Yellow & White, 1×7	do.	0	8	6		—	
Do. do. do. ⅞×7	do.	0	8	0		—	
Do. do. do. ¾×7	do.	0	7	6		—	
Do. do. White, 1st & 2nd, ⅞×7	do.	0	8	9		—	
Do. do. do. do. ⅞×6	do.	0	8	6		—	
Do. do. Yellow, 3rd, 1×6½	do.	0	9	6		—	
Do. do. do. do. 1×7	do.	0	10	0		—	
Do. do. do. do. ¾×7	do.	0	8	6	0	8	9
Do. do. do. do. unsorted, 1×6	do.	0	10	0		—	
Do. do. do. do. 1×5½	do.	0	9	6		—	
Do. do. do. do. ⅞×7	do.	0	8	9	0	9	0
Do. do. do. do. ⅞×6	do.	0	8	9		—	
Do. do. do. do. ⅞×5½	do.	0	8	6		—	
Do. do. do. do. ⅞×5	do.	0	8	3		—	

Hard Woods.

		£	s.	d.	£	s.	d.
Ash, Quebec	per load	4	0	0	7	0	0
Birch, New Brunswick	do.	2	10	0	4	15	0
Do. Quebec	do.	3	0	0	5	0	0
Box, Turkey	per ton	6	0	0	20	0	0
Cedar, Cuba	per ft. sup.	0	0	4½	0	0	6
Do. Honduras	do.	0	0	4½	0	0	5½
Do. Tobasco	do.	0	0	5⅝		—	
Elm, Quebec	per load	4	0	0	8	5	0
Jarrah, planks	per ft. cu.	0	2	6	0	3	0
Mahogany, Average Price for Cargo, Honduras	per ft. sup.	0	0	4¼	0	0	5½
Do. Tobasco	do.	0	0	4	0	0	5½
Do. Cuba	do.	0	0	4½	0	0	5½
Do. African	do.	0	0	3¼	0	0	5
Do. Lagos	do.	0	0	3¼	0	0	5
Oak, Wainscot	per log	2	15	0	5	15	0
Teak, Indian, logs	per load	8	15	0	19	0	0
Do. do. planks	do.	11	15	0	20	0	0
Whitewood, American, logs	per ft. cu.	0	1	3	0	1	6
Do. do. planks and boards	do.	0	1	3	0	3	6

Builders' Current Price List of Specialities

This list is not intended to promote undercutting, and prices are subject to discounts for a quantity and for cash. Readers are advised to write for these discounts. Where prices for goods are standardised and fluctuation takes place in trade discounts, our prices have the discounts deducted. In some cases it is difficult for firms to quote prices, and we have stated where they will be pleased to send catalogues and quotations immediately on receipt of applications.

Goods.	Description.	Merchants or Manufacturers.	Address.	Size.	Weight.	Quantity. per	Price		
							On Rail.	Dlvrd. at London Termini.	Dlvrd. to Buyer
Baths:									
Iron	Rolled edge, white vitreous enamelled	Doulton and Co., Ltd.	Lambeth, London	5ft. 6in. inside	—	each	£4 7s. 6d.	—	—
Bathroom Suites	Complete as advertised	Standard Sanitary Manufacturing Co.	22, Holborn Viaduct, London	—	—	—	—	—	£18 18s.
Blinds:									
"Japa"	Sanitary	Japa Blinds, Ltd.	55, Barbican, London, E.C.	All sizes	72 long 36 wide	—	—	2s. 6d. to 16s. doz.	Free.
Boilers:									
Saville	Wrought-iron for hot-water heating and supply	Hartley & Sugden, Ltd.	Halifax	30×13 to 72×30	3 cwt. to 17 cwt.	each	£9 5s. to £52	Free in Great Britain.	
Bricks:									
Blue	Staffordshire pressed	Hathern Station Brick and Terra Cotta Co., Ltd.	Loughborough	$9 \times 4\frac{1}{2} \times 2\frac{5}{8}$	3·5 tons	1000	£2 15s.	£3 13s.	—
Facing	Blue and brindled	G. Woolliscroft & Sons, Ltd.	Hanley, Staffs.	$9 \times 4\frac{1}{2} \times 3$	3·75 tons	1000	35s. to 37s. 6d.	£4 3s. to £3 5s. 6d.	—
Facing	Red terra-cotta	G. Woolliscroft & Sons, Ltd.	Hanley, Staffs.	$9 \times 4\frac{1}{2} \times 3$	3·75 tons	1000	£2 10s.	£3 18s.	—
Stocks	Sand stocks	Gibbs Brothers	Loughborough	$9 \times 4\frac{1}{2} \times 2\frac{5}{8}$	2·12 tons	1000	£2	£2 15s.	—
Casements and Sashes:									
Metal Casements	Iron, steel, and bronze	George Wragge, Ltd.	London and Manchester	Registered sections	—	each	From 15s.	16s.	—
Metal Sashes	Ditto	Ditto	Ditto	Ditto	—	ft. super.	From 6d.	—	—
Castings:									
Iron	Plain and Ornamental	Walter Macfarlane & Co.	Saracen Foundry, Glasgow	—	—	—	Prices on application.		
Cement, Lime, &c.:									
Cement	Portland	Associated Portland Cement Mnfrs. (1900), Ltd.	Dixon House, 72, Fenchurch Street, E.C.	—	—	—	Prices on application.		
Lime	——	Associated Portland Cement Mnfrs. (1900), Ltd.	Dixon House, 72, Fenchurch Street, E.C.	—	—	—	Prices on application.		
Chimney-Pieces:									
Marble	——	J. & H. Patteson	7, Bayley Street, Bedford Sq., London, and Oxford Street, Manchester	—	—	—	Prices on application.		
Chimney Pots	"Notlor" patent self-flanching and weathering	Notley & Taylor	Finsbury Pavement House, E.C.	9×9 and 14×9 flues	—	—	—	From 3s. 6d.	—
Closets:									
Cisterns, Seats, &c.	For houses	Adamsez, Ltd.	Scotswood-on-Tyne	—	—	set with fittings.	£2 to £10	—	—
Latrines	For schools and workmen	Adamsez, Ltd.	Scotswood-on-Tone	—	—	stall	30s. to 70s.	—	—
"Simplicitas"	——	Doulton & Co., Ltd.	Lambeth, London	—	—	each	£1 15s.	—	—
Columns	Cast-iron	Measures Bros., Ltd.	53B, Southwark Street, London, S.E.	stock patterns	—	ton	£7	£7	—
Compoboard	Swedish	Messers, Ltd.	79½, Gracechurch Street, E.C.	4ft. × 8 to 18ft. × ⅜in. and ¼in.	1 ton	2,000ft. super.	Prices on application.		
Concrete:									
Armoured	Floors and roofs	Trussed Concrete Steel Co.	Caxton House, Westminster	—	—	sq. yard	—	—	8s.*
Conduits:									
"Simplex" steel	Screwed wireduct	Simplex Steel Conduit Co., Ltd.	Garrison Lane, Birmingham	½ to 2 diam.	20lbs. to 140lbs.	100ft.	—	—	12s. 8d. to £3 3s.
Door Furniture:									
Door Springs	With silent check	Robert Adams (patentee)	3 & 5 Emerald Street, London, W.C.	For medium doors	—	each	D.A. 46s. S.A. 42s.	D.A. 46s. S.A. 42s.	—
Sliding Door Fittings	Top and bottom rollers and guide rails	John Bousfield	Bar Ironworks, York	various	—	each	—	rollers from 6s. 6d.	—
Elevators:									
"Otis"	Electric and hydraulic	Otis Elevator Co. Ltd.	4, Queen Victoria Street, London	—	—	—	Prices on application.		
Enamels:									
"Sanaline"	Pure white or colours	Aspinal's Enamel, Ltd.	New Cross, London	—	—	gallon	—	—	18s.
Faience:									
White and coloured	For elevations	Alfred Whitehead	Prudential Build'gs, Leeds	—	—	sq. yard	74s. 6d.	79s.	—
Fans:									
Fans, Blowers, and Motors	Belt, electric or steam driven	Matthews & Yates, Ltd.	Cyclone Works, Swinton, Manchester	All sizes	—	—	Prices on application.		
Felt:									
Ruberoid Sacking Felt	High-grade inodorous felt	Robert W. Blackwell & Co., Ltd.	59, City Road, London, E.C.	36×72	44lbs.	roll, 24sq. yds.	—	—	13s. 6d.
Fencing:									
Iron	"Greenhill" patent automatic railing	Hill & Smith	Brierley Hill Iron Works, Staffs.	3½ft. high ⅝ verticals	40lbs. yard	yard	4s. 5d.	4s. 9d.	—
Fireproofing (See also Partitions):									
Terrawode Brickwood	Fireproof floors	Jabez Thompson & Sons	Northwich, Cheshire	4ins. thick	—	sq. yard	6s.	7s.	—
Columbian	Reinforced concrete floors and roofs	Columbian Fireproofing Co.	37, King William Street, London	—	—	—	Prices on application.		
Steel Sheeting	For partitions, reinforced concrete, damp course, &c.	The Fireproof Co., Ltd.	10, York Build'gs, Adelphi, W.C.	All sizes	All weights	sq. yard	from 1s. 3d.	from 1s. 3d.	plus rail
Expanded Steel	Reinforcement for every description of concrete work	New Expanded Metal Co.	York Mansion, York, St., Westminster, S.W.	Up to 16ft. × 8ft.	2lbs to 30 lbs.	sq. yard	5d. to 4s. 9d.	Price list on application.	
Floors and Roofs	Steel concrete	Homan & Rodgers	17, Gracechurch Street	—	—	sq. yard	—	—	7s.*
Floors and Roofs	Reinforced concrete	Trussed Concrete Steel Co.	Caxton House, Westminster	—	—	sq. yard	—	—	8s.*
Floors and Roofs	Reinforced concrete	Potter & Co., Ltd.	66, Victoria St., London, S.W.	—	—	sq. yard	—	—	From 6s.*
Floors:									
Columbian	Concrete fireproof floors and roofs	Columbian Fireproofing Co.	37, King William Street, London	—	—	—	Prices on application.		
Euboeolith	Patent flooring	Euboeolith Patent Flooring	3, Victoria St., Westminster	—	—	yd. super.	5s. to 6s.	—	—

* Erected.

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Builders' Current Price-List of Specialities—*(continued).*

Goods.	Description.	Merchants or Manufacturers.	Address.	Size.	Weight.	Quantity. per	Price. On Rail.	Price. Dlvrd. at London Termini.	Price. Dlvrd. to Buyer.
Galvanised Iron:									
Sheets	Corrugated	Baldwins, Ltd.	5, Fenchurch St., London, E.C.	5ft. to 9 ft. × 2ft. × 22 or 24 G.	—	ton	—	£14 10s.	—
Sheets	Flat	Baldwins, Ltd.	5, Fenchurch St., London, E.C.	72 × 24 to 36 × 20 or 24 G.	—	ton	—	£15	—
Buildings	Of every description	Baldwins, Ltd.	5, Fenchurch St., London, E.C.	—	—	—	Prices on application.		
Gas Generators:									
Acetylene	Five-light portable	Strode & Co.	48, Osnaburgh Street, London.	15ins. diameter, 24ins. high.	—	each	—	£3	—
Glass:									
Stained & Embossed	Leaded lights, embossed and brilliant cut-glass	Young & Martin, Ltd.	Stratford, E.	—	—	—	Prices on application.		
Stained	Memorial & other windows	E. E. Oldacre & Co.	Stirling Place, Hove	—	—	ft. super.	Prices on application.		
Guards, Wire:									
Straight Lattice	Half mesh	Richard Johnson, Clapham, & Morris, Ltd.	Manchester	6ft. × 3ft.	14lbs.	sq. ft.	5d.	5½d.	5¾d.
Hooks:									
Hat and Coat	"Schola" pattern for schools, &c.	Brookes & Co., Ltd.	4, Cateaton Street, Manchester.	—	—	—	Prices on application.		
Joinery:									
Panelling	High-class 1-in. Austrian oak panelling.	Elliott's Moulding & Joinery Co., Ltd.	Newbury	3ft. to 7ft. high.	ft. super.	2s.	2s. 1d.	—	—
Joists:									
Steel	Broad flange beams	H. J. Skelton & Co.	71, Finsbury Pavement, London, E.C.	—	—	ton	—	£6 18s.	—
Steel	English and foreign	Columbian Fireproofing Co.	37, King William Street London.	—	—	—	Prices on application.		
Steel	Belgian and German	Measures Bros., Ltd.	53B, Southwark Street, London, S.E.	3 to 20 deep	—	ton	£6 10s. basis sections.	£6 10s. basis sections.	—
Laundry Machinery:									
Finishing Machines	For Shirts, Collars, & Cuffs	W. Summerscales & Sons, Ltd.	Keighley, Yorks	12ins. to 42ins.	—	each	£30 to £50	£30 10s. to £51 10s.	—
Lavatories:									
Glazed Ware	For schools, workmen, and private houses.	Adamsez, Ltd.	Scotswood-on-Tyne	—	—	set, with fittings	£1 10s. to £4	—	—
Leaded Lights	All descriptions	E. E. Oldacre & Co.	Stirling Place, Hove	—	—	ft. super.	Prices on application.		
Lifts:									
Electric	All other types	A. Smith & Stevens	Battersea, London	All sizes.	All weights.	—	Prices on application.		
Hand-power	All kinds, for all purposes	George Johnson	227, St. John's Hill, London, S.W.	—	—	—	Prices on application.		
"The Premier"	Dinner and service lift to raise ¾ cwt.	The Lift & Hoist Co.	Premier Iron Works, Prince Street, Deptford, S.E.	Cage *inside* 2ft. wide, 1ft. 6 deep. 2ft. 6 high.	—	—	—	£9 10s.	—
Lighting and Heating:	Electric light and gas-fittings, &c.	Young & Marten, Ltd.	Stratford, E.	—	—	—	Prices on application.		
Lightning Conductors	Copper tape	Joseph Lewis	5 & 6, Great Winchester Street, London, E.C.	¾ × ⅛ and upwards.	—	foot run	from 1s.	—	—
Locks:									
Coin Collecting	Bright brass or bronzed	New Century Co.	235, High Holborn, London, W.C.	14ins. × 4¼ins. × 1¼ins.	—	each	—	—	35s.
Kaye's Patent	Four lever mortice, iron and brass.	Joseph Kaye & Sons, Ltd.	93, High Holborn, London, W.C.	—	—	each	—	—	7s. 6d. 10s. 6d
"C. and B."	Registered mortice Nos. 1, 2, and 3.	Colledge & Bridgen	Midland Works, Wolverhampton.	6 inch.	—	dozen	—	—	£3 6s. £2 5s. £1 9s.
Mantelpieces:									
White Wood	With overmantel	The Hardware Trading Co.	12, New Oxford Street, London, W.C.	Opening 38 × 38	72ins.	each	£2	—	—
Marble, Mosaic, and Stone Work:									
Glass Mosaic	Coloured art	The Cloisonné Glass Co.	40, Berners Street, W.	—	—	sq. ft.	—	From 3s. upwards.	—
	Plain or design	J. & H. Patteson	7, Bayley Street, Bedford Square, London, and Oxford Street, Manchester.	—	—	—	Prices on application.		
Motor Wagons	Steam	St. Pancras Ironworks Co. Ltd.	171, St. Pancras Road, London, N.W.	—	4 tons 19 cwt.	each	—	From £530.	—
Paint:									
"Japonika," Enamel	Elastic, impervious, covers 90yds. sup. per gal.	John Line & Sons, Ltd.	Alfred Pl., Tottenham Court Rd., London, W.C.	—	—	gallon	18s.	—	—
Anti-corrosive, &c.	"Bitumastic" solution and enamel	Wailes, Dove & Co., Ltd.	Newcastle-on-Tyne, London, Liverpool, Cardiff, Birmingham, and Glasgow	—	—	—	Prices on application.		
Partitions:									
Dovetail Corrugated Steel Sheeting	For partitions, reinforced concrete, &c.	The Fireproof Co., Ltd.	10, York Buildings, Adelphi, W.C.	All sizes	All weights	sq. yard	From 1s. 3d.	From 1s. 3d.	1s. 3d. plus rail
Partitions	"Kulm" slabs	H. W. Cullum & Co.	Craven House, Kingsway, London, W.C.	—	—	sq. yard	Prices on application.		
Patent Plaster	Hollow interlocking blocks	Havelock Patent Plaster Partition Co.	63, Finsbury Pavement, E.C.	29 × 17	70lbs.	super. yard.	3s. 6d.	4s. 6d.	6s. *
Plaster	Partition slabs	Jabez Thompson & Sons	Northwich, Cheshire	12 × 12 × 2	—	sq. yard	3s. 6d.	4s.	—
Porous Brick	Porous terra-cotta blocks	Hempstead Patent Brick Co.	Hemel Hempstead	9 × 12 × 1½	—	sq. yard	2s.	2s. 4d.	—
Terrawode Brickwood	Partition bricks	Jabez Thompson & Sons	Northwich, Cheshire	9 × 4½ × 3	2 tons	1000 sq. ft.	£3 5s.	£4 9s.	—
School	—	John Stones	"Rosside," Ulverston	—	—	—	Prices on application.		
Pavement Lights	Prismatic	St. Pancras Ironworks Co.,	171, St. Pancras Road, London, N.W.	—	—	per ft. super.	—	From 4s. 6d.	—
Photo Prints, Copies, &c.:									
"True to scale"	(Dorel system)	W. F. Stanley & Co., Ltd.	13, Railway Approach, London Bridge, S.E.	Imperial	—	2 copies	—	—	2s. 3d. p. free.
True scale	Dorel and photo-litho methods	Vincent, Brooks, Day & Son, Ltd.	48, Parker Street, Kingsway, London, W.C.	—			Prices on application		
All Kinds	On any material	London Drawing and Tracing Office.	98, Gray's Inn Road	—			Prices on application.		

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Builders' Current Price-List of Specialities—*(continued).*

Goods.	Description.	Merchants or Manufacturers.	Address.	Size.	Weight	Quantity. per	Price.		
							On Rail,	Dlvrd. at London Termini.	Dlvrd. to Buyr.
Pipes :									
Columbian	Armoured cement for water and sewage conveyance	Columbian Fireproofing Co.	37, King William Street, London	—	—	—	Prices	on applica	tion.
Iron Soil	Large assortment of fittings stocked	Burn Brothers	Rotunda Works, 3, Blackfriars Rd., London, S.E.	2ins. to 6ins.	L.C.C. & heavy	—	Prices	on applica	tion.
Pipe joint paste	"Wisconsin" Graphite	G. F. Hopkins & Co	112, Westminster Bridge Road, London, S.E.	—	—	1 lb. to 60 lbs.	1s. 1d. to 6½d.	—	—
Plaster :									
Fibrous, &c.	For relief decoration	G. & A. Brown, Ltd.	167, Hammersmith Road, W.	—	—	—	Prices	on applica	tion.
Keene's & Parian	——	Associated Portland Cement Mnfrs. (1900), Ltd.	Dixon House, 72, Fenchurch Street, E.C.	—	—	—	Prices	on applica	tion.
"Pytho"	For interior plastering	Plaster, Brick, and Stone Co., Ltd.	Wall Grange, near Leek, Staffs.	—	1 ton	—	37s. 6d.	42s. 2d.	—
Rainwater Heads and Pipes :									
Rainwater Heads	Cast lead and iron	George Wragge, Ltd.	London and Manchester	stock designs	—	each	From 16s. 6d.	17s. 6d.	—
Roofs :									
Ruberoid Roofing	High-grade prepared roofing	Robert W. Blackwell & Co., Ltd.	59, City Rd., London, E.C.	36×72	40lbs. to 100lbs.	216 sq. ft.	—	½ ply, 17s. 4d.; 2 ply, £1 6s. 6d.	1 ply, 20s. 6d.; 3 ply, 34r. 6d.
Steel	Principals and corrugated iron	E. F. Blakeley & Co.	Vauxhall Ironworks, Liverpool	—	—	ft. super.	—	From 6d. upwards.*	—
Sanitary :									
Engineers' Appliances	Baths, lavatories, closets, pipes, cisterns, pumps, &c.	Young & Marten, Ltd.	Stratford, E.	—	—	—	Prices	on applica	tion.
Syphons and Tanks	Automatic flushing	Adamsez, Ltd.	Scotswood-on-Tyne	—	—	each	£1 to £3	—	—
Waste Preventers	"Paisley," painted	Doulton & Co., Ltd.	Lambeth, London	2 gallon	—	each	£1 3s. 6d.	—	—
Waste Preventers	"Well," painted	Doulton & Co., Ltd.	Lambeth, London	2 gallon	—	each	16s.	—	—
Scaffolding :									
Putlogs	Hewn birch	Vigers Bros.	67-68, King William Street, E.C.	—	—	dozen	5s. 3d. in docks	—	—
Shutters :									
Revolving	No. 7 convex wood lath	Clark, Bunnett & Co., Ltd.	New Cross Road, London, S.E.	—	—	ft. super.	1s. 6d.	—	—
Signs	Anything and Everything	H. B. Torode	22, Henrietta St., Strand	L.C.C. regulation size	—	—	Prices	on applica	tion.
Sinks :									
Glazed Ware	"Krator," "Helios," "Belfast," and "Edinburgh"	Adamsez, Ltd.	Scotswood-on-Tyne	—	—	each	10s. to £5	—	—
Slates and Slating :									
"Arfon" Slates	Unfading green	Pearson Bros. & Campbell	18, Water St., Liverpool	—	—	—	Prices	on applica	tion.
Buttermere or Cumberland & Westmoreland Green Slates	Light sea green, olive, and dark	Buttermere Green Slate and Stone Works	Keswick	30 to 12 long	—	ton	£4 5s.	£5	—
Slating and Tiling	All kinds — green slating speciality	Roberts, Adlard & Co.	London, Faversham, Brighton, &c.	as required	—	1 000	Prices	on applica	tion.
Slates and Slating	Portmadoc, French, and American	Young & Marten, Ltd.	Stratford, E.	—	—	—	Prices	on applica	tion
Sound-Proofing :									
Deafening Quilt	Cabots' double ply	Arthur L. Gibson & Co.	19/21, Tower St., Upper St. Martin's Lane, London, W.C.	—	120 lbs.	bale, 500 sq. ft.	36s. 6d.	—	—
Springs :									
Door Checks	"Blount"	Charles Winn & Co.	Birmingham	—	—	—	Prices	on applica	tion
Stone :									
Bramley Fall	Sandstone, light and grey	B. Whitaker & Sons, Ltd.	Horsforth, near Leeds	any sizes	14ft. to 1 ton	cube ft.	10d.	1s. 9d.	—
Granite	Architectural and monumental	Kirkpatrick Brothers	Trafford Park, Manchester	—	—	—	Prices	on applica	tion
Dark-Bed Hopton Wood	Hard limestone, colour grey	J. Hodson & Son, Ltd.	Nottingham	random blocks	—	foot cube	1s. 2d.	2s.	—
Yorkshire	Sandstone. various colours	J. Hodson & Son, Ltd.	Nottingham	random slabs	14ft. cube to ton	foot cube	From 2s	From 2s. 10d.	From 3s.
Staircases :									
Spiral	——	St. Pancras Ironworks Co., Ltd.	171, St. Pancras Road, London, N.W.	From 3ft. 6ins. diam.	—	per ft. rise	—	From 13s.	—
Terra-cotta :									
Window Heads	Buff or red	Walwyn T. Chapman	Cleethorpes	3×9 4½×10	1 cwt.	each	5s.	—	—
Tiles :									
Coloured Enamelled	Best quality in brown, blue, green, &c.	Carter & Co.	Encaustic Tile Works, Poole.	usual sizes	1 ton	55 yds. sup.	10s. 6d. per yd.	11s. per yd. sup.	11s. 2d. per yd.
Tessellated	Best quality any plain pattern	Carter & Co.	Encaustic Tile Works, Poole.	usual sizes	2 tons	80 yds. sup.	5s. per yd. sup.	5s. 4d. per yd.	5s. 6d. per yd.
Decorative	Floor	Craven, Dunnill & Co, Ltd.	Jackfield, R.S.O., Shropshire	every size	56 lbs.	sq. yard	from 3s. 6d.	4s. 6d.	4s. 6d.
Ditto	Wall	Craven, Dunnill & Co., Ltd.	Jackfield, R.S.O., Shropshire	—	40 lbs.	—	from 5s. 6d.	6s. 4d.	6s. 4d.
Ditto	Mosaic	Craven, Dunnill & Co., Ltd.	Jackfield, R.S.O., Shropshire	—	48 lbs.	—	from 13s. 9d.	15s.	15s.
Ditto	Faience	Craven, Dunnill & Co., Ltd.	Jackfield: R.S.O., Shropshire	—	170 lbs.	—	from £1 3s.	£1 5s.	£1 5s.
"Opalite"	Opal glass, with Shelmerdine backing	Wm. Griffiths	126, Hamilton Ho., Bishopsgate St., Without, E.C.	9×3 and 6×6	—	sq. yard	—	—	10s. 6d.†
Wall	Patent undercut back	T. & R. Boote, Ltd.	Burslem	6×6	50 lbs.	sq. yard	6s.	6s. 6d.	6s. 9d.‡
"Durolite"	Glass tiles, with patent fireproof backing to prevent surface cracking	Durolite Ltd.	36, Camomile Street, London, E.C., and St. Helens, Lancashire	white and tinted 6×6 and 9×3 marbled 12×6	—	sq. yard	—	—	white† 10s. 0d. tinted† 11s. 6d. mrbls.† 12s. 6d.
Timber :									
Planks	Dry Mahogany and Oak	James W. Southern & Son	Store Street Saw Mills, Manchester.	—	—	—	—	—	—
Tracing Cloth :									
"Ivorine"	Pure white	Norton & Gregory, Ltd.	Castle Lane, Westminster	30ins. × 24yds.	—	roll	—	—	22s. 6d.
"Koh-i-noor"	——	L. & C. Hardmuth	12, Golden Lane, London, E.C.	30, 36, 40, 42	—	roll of 24 yds.	Prices	on applica	tion.
"Triumph" Brand	Blue	Norton & Gregory, Ltd.	Castle Lane, Westminster	30ins. × 20yds.	—	roll	—	—	12s. 6d.
Urinals :									
Glazed Ware	Circular slab and T-backs	Adamsez, Ltd.	Scotswood-on-Tyne	—	—	stall, with fittings	£3 to £15	—	—
Ventilators :									
"Acme" & Spherical	Exhausts and intakes	Acme Ventilating & Heating Co.	35, Tarleton Street, Liverpool	6ins. to 24 diam. tube	—	each	—	—	17s. 6d. to £15.
Boyle's Patent	Latest "air-pump" ventilators (design No. 175)	Robert Boyle & Son	London and Glasgow	12ins. to 54ins. diam.	—	each	—	—	25s. to £18 18s.
Vices :									
"Lightning"	Instantaneous action	C. Nurse & Co.	181-183, Walworth Road, London, S.E.	jaws 9 ins. opening 12	50 lbs.	each	17s.	—	—

* Erected. † Approximate price fixed, complete, in London. ‡ Executed.

This List is not intended to promote undercutting. Readers should write for discounts for quantity and for cash.

THE BUILDERS' JOURNAL

AND ARCHITECTURAL ENGINEER.

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Men Here and Elsewhere. A MOST uninspiring production on the face of it, but one, nevertheless, which sets forth a multitude of valuable and interesting facts, is the Third Abstract of Foreign Labour Statistics just issued by the Labour Department of the Board of Trade. For the most part—and there is a good deal of it (more than 300 pages)—the book consists of a series of tables of wages, hours of labour, trade-union numbers, &c., in various countries of Europe, in the United States, and in Japan. The European countries of which figures are given comprise Russia, Norway, Sweden, Denmark, Germany, Holland, Belgium, France, Italy, Austria-Hungary, Switzerland and Spain, and, as the latest figures available are followed, the result is a very serviceable comparative record. To attempt any elaborate summary of the figures relating to the various branches of the building trade in the several countries would be quite outside our present space, and, except to a few statisticians, would not be of much interest. We may, however, extract a few comparative facts. Taking the wages of bricklayers in London, for example, at an average of 10½d. per hour, or 43s. 9d. for an average of 50 working hours per week, we turn to the figures for New York and we see what an immense difference there is in the rate of wages, with an appreciable reduction in the number of working hours, these being respectively 2s. 8½d. and 44 hours, giving a sum of £5 19s. 2d. as the weekly total. Yet in England the wages are higher than they are on the Continent. In Berlin the bricklayer gets 8½d.; in Paris, 7¾d.; in Christiania, 6¾d.; in Amsterdam, 5½d.; in Brussels, 3¾d.; and in Rome, 3¼d.; while the hours of labour per week are as follows: Berlin 53, Paris 54, Christiania 60, Amsterdam 58½, Brussels (no figures given), Rome 60. From this it will be seen that bricklayers in London work fewer hours and get paid higher wages than they do in foreign cities. And there is very much the same thing to record in respect of other building trade employees—masons, carpenters, plumbers, plasterers, &c. Belgium and Italy of course provide the greatest contrasts to ourselves. With regard to the trade-unions, the figures in the Abstract indicate that it is in those countries of progressive industrial development that trade-unionism makes steady and, in some cases, rapid growth. In Germany, for example, during 1899 and 1904 the social democratic societies (*Geweskschaften*) nearly doubled their membership, and they now embrace more than two-thirds of the organised workers there—in fact, they are the largest trade societies in the country; in France, too, rapid growth has taken place, the building trades having the largest number of organisations; but in Denmark a noticeable diminution has occurred. The above are just a few of the interesting facts given in the Abstract. Of the rest we would leave readers to study for themselves. We would observe in conclusion, however, that there is a good deal said about conciliation and arbitration, and one of the most interesting statements is that the voluntary Boards of Conciliation and Arbitration which play so large a part in the settlement of industrial disputes in the United Kingdom hardly exist in foreign countries. So much do we hear about our own deficiencies, and so much about the wonderful merits of others, that facts like these are decidedly refreshing.

The Office Tower Again. SOME time ago we made a suggestion in these columns about office towers—tall shafts of buildings to be erected on a comparatively small area, with a suite of offices on each floor: the idea being to enable occupiers to get abundance of light and air, as compared with the huddling of rooms in basements or semi-basements, or in places where the air is stagnant and the light very deficient. The suggestion having been made in these columns, we were glad to see in the *Daily Chronicle* last Friday an announcement from a Berlin correspondent to the effect that Dr. Scherl, a well-known physician in the German capital, and an authority on national hygiene, has made a proposal to the Berlin Town Council that they should build "airy pavilions at several points of the city at about 160ft. above the level of the streets," these pavilions being reached by elevators, and intended "to afford rest and refreshment and good air to citizens weary of the maddening noises, the unrest, and the noxious smells of the streets." The proposal is not quite the same as our own, but it has a similar object in view. We shall be interested to hear what comes of it.

The Ancient Subject. THERE is quite a collection of subjects relating to architecture which have been dealt with so many times during the past fifty years, and still live on in hoary age, that we have become quite resigned to see them brought forward at regular intervals—unnoticed, it is true, by the generation which grew up with them, but evincing in the younger blood a sort of stir of enthusiasm. Such are "colour in architecture," "the collaboration of architect and sculptor" and all the rest—good old stock subjects for every president to fill up his address with, in between the snippets about professional practice and new buildings; subjects revered by the congress-monger as being of that excellent variety which will foster discussion on a vague basis without any risk of awkward personalities. Would that they could be buried—at least for a decade. We have only to turn to reports of meetings in the 'fifties to see that members were still at it then, hammering away in a mild form. Oh, for the sledge-hammer to flatten them out!

A MOSQUE FOR LONDON.

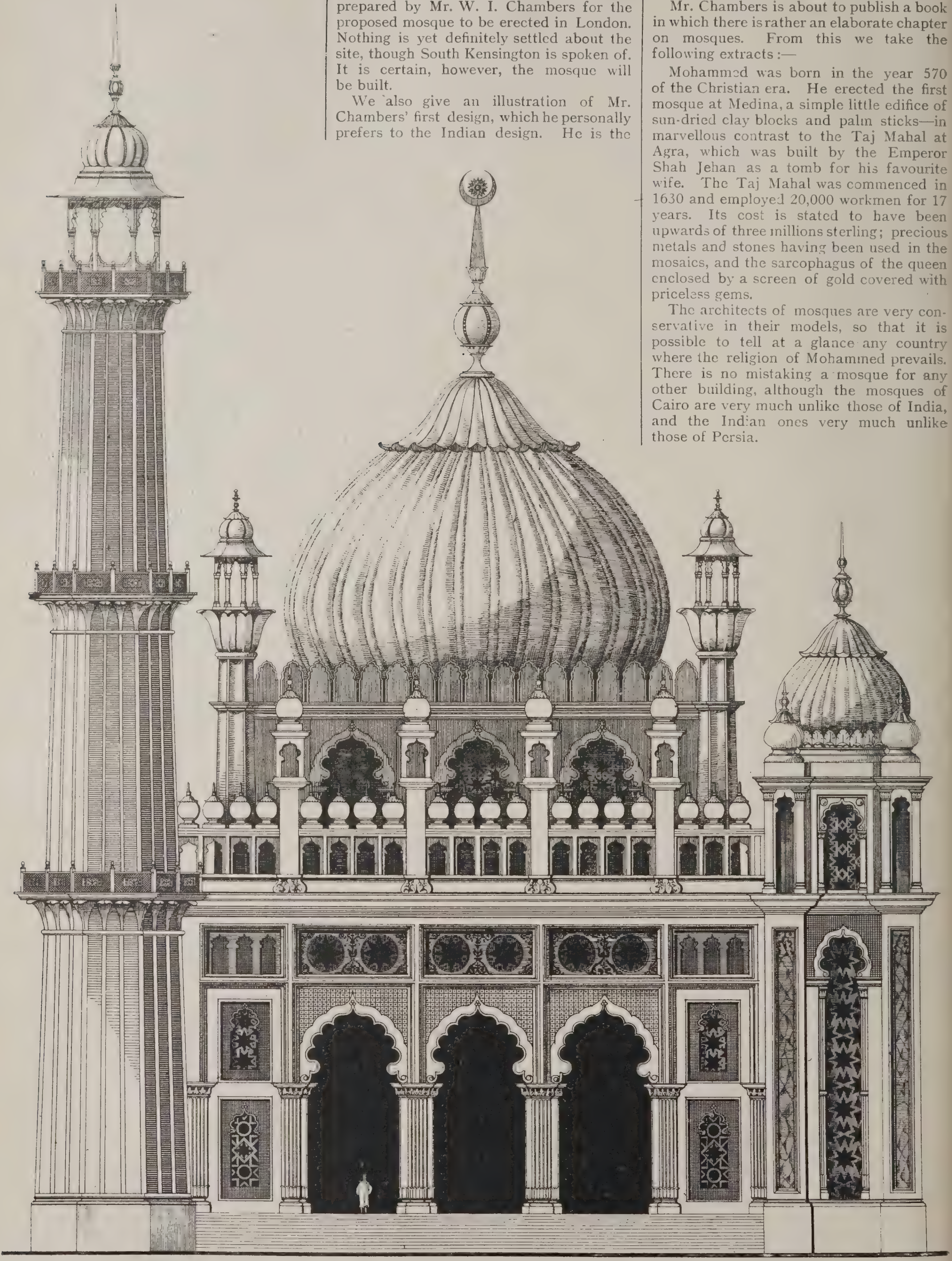
We illustrate on this page the design prepared by Mr. W. I. Chambers for the proposed mosque to be erected in London. Nothing is yet definitely settled about the site, though South Kensington is spoken of. It is certain, however, the mosque will be built.

We also give an illustration of Mr. Chambers' first design, which he personally prefers to the Indian design. He is the architect of the mosque erected at Woking about fifteen years ago. At that time it was the only one of its kind in Europe.

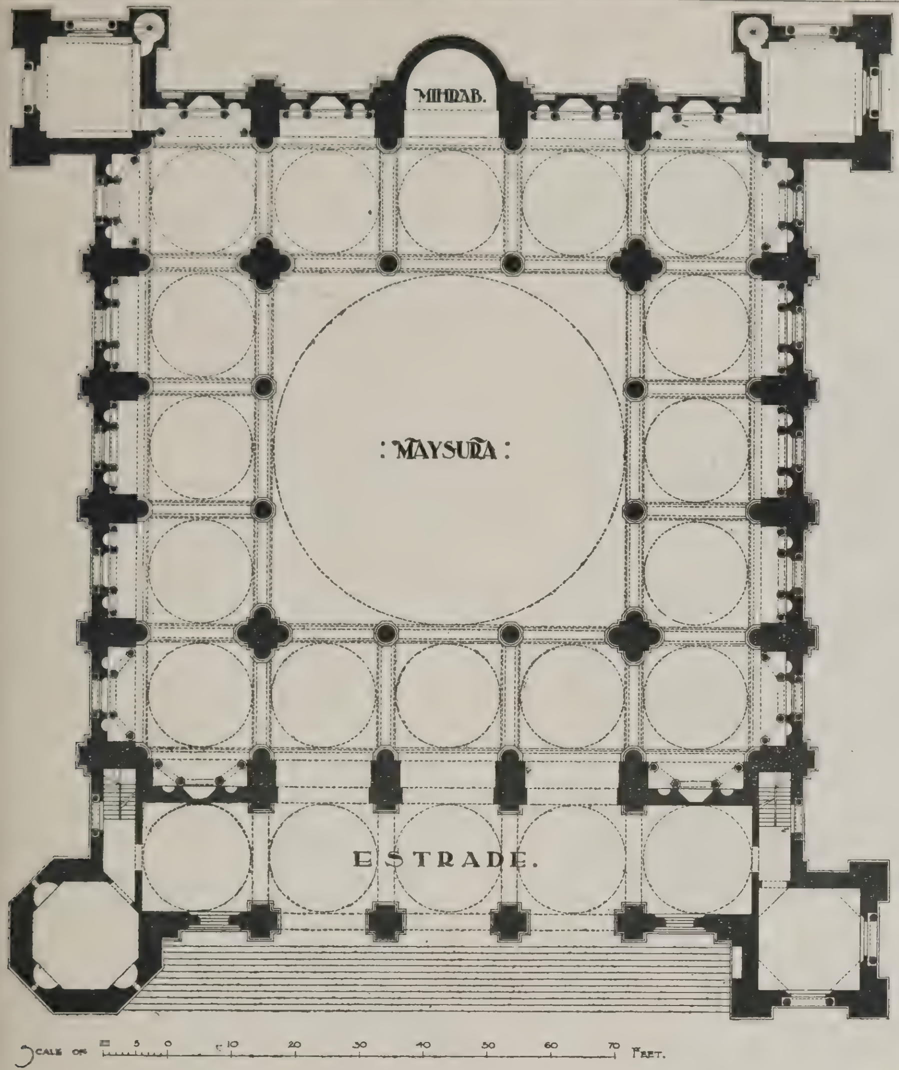
Mr. Chambers is about to publish a book in which there is rather an elaborate chapter on mosques. From this we take the following extracts:—

Mohammed was born in the year 570 of the Christian era. He erected the first mosque at Medina, a simple little edifice of sun-dried clay blocks and palm sticks—in marvellous contrast to the Taj Mahal at Agra, which was built by the Emperor Shah Jehan as a tomb for his favourite wife. The Taj Mahal was commenced in 1630 and employed 20,000 workmen for 17 years. Its cost is stated to have been upwards of three millions sterling; precious metals and stones having been used in the mosaics, and the sarcophagus of the queen enclosed by a screen of gold covered with priceless gems.

The architects of mosques are very conservative in their models, so that it is possible to tell at a glance any country where the religion of Mohammed prevails. There is no mistaking a mosque for any other building, although the mosques of Cairo are very much unlike those of India, and the Indian ones very much unlike those of Persia.



PROPOSED MOSQUE FOR LONDON. W. I. CHAMBERS, ARCHITECT.



It is not generally known that the architects of the earlier mosques were the first to use the pointed arch from which sprang the style we call Gothic, also that owing to the Koran forbidding the representation of any living thing about the mosque the old Saracens invented a style of ornament purely geometrical, some of which is exquisite—for example, their pierced stone and marble lattices and doors.

Some of the domes of mosques in India are marvels of construction. That of the Tomb of Mahmud at Bijapur is 135 feet in diameter. This is practically the size of the dome of Florence Cathedral, but this latter rises from an octagon, whereas the former springs from a square base, presenting difficulties not encountered at Florence, and the way these have been overcome is certainly beautiful.

Islam possesses the finest dome in the world, for Sta. Sophia at Constantinople has never been approached.

Points of Planning.

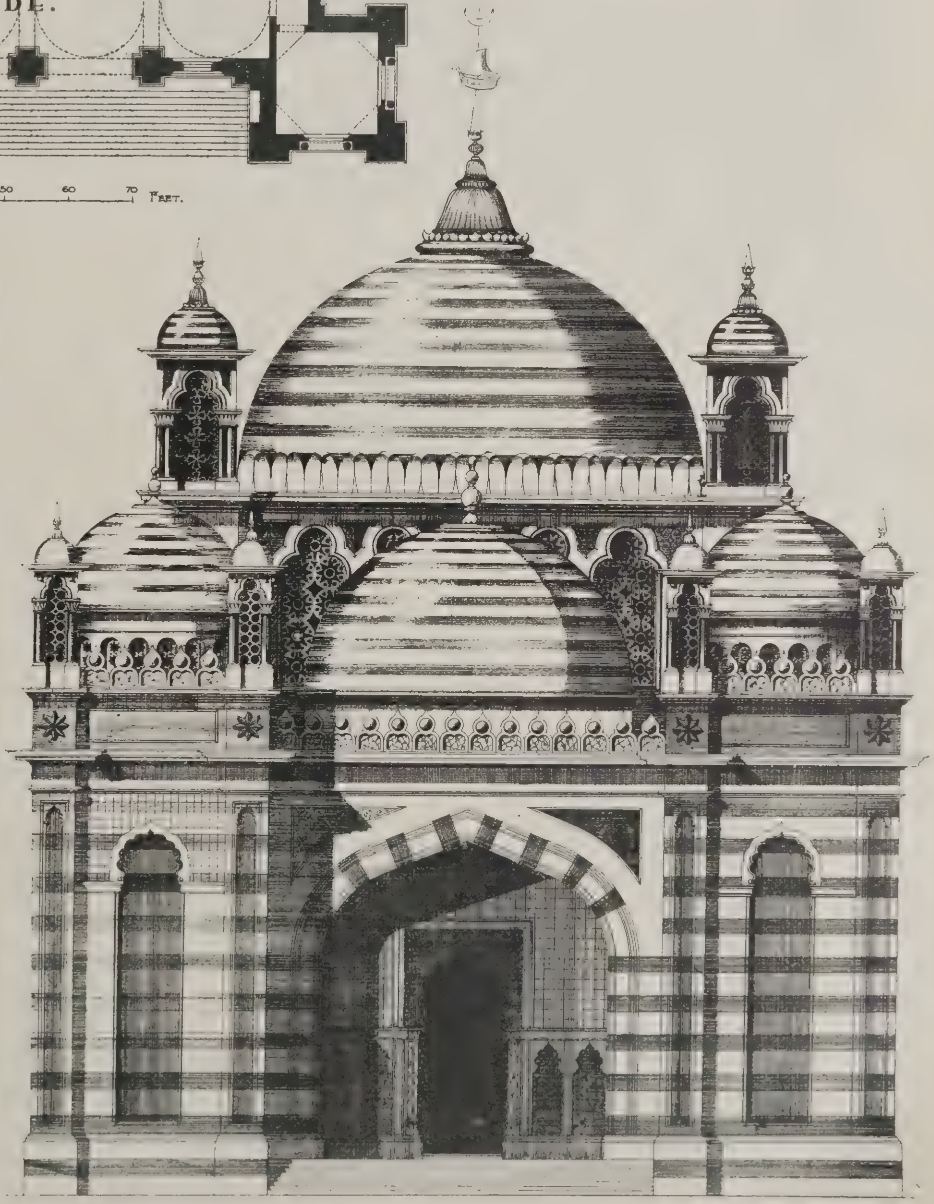
The plan of a mosque is not unlike a Christian church. One of the requirements is that the principle interior wall facing those who pray must be in the direction of Mecca: when the mosque at Woking was built this was considered so important that a captain of a P. & O. boat took the bearings, and the true direction is engraved on a stone under cover near the "mihrab," which is a recess in the wall corresponding to the apse of our churches. The mihrab is always the richest and most adorned part of the edifice. Sometimes there are other niches in the same wall called "pseudo mihrabs," and sometimes these are outside the building; but, whatever their position, they must be so situated that the worshipper faces Mecca when he prays.

The next most holy place is the space in front of the mihrab called the "maysura," corresponding to the nave of our churches. In it are situated the "mimbar" (pulpit) and the "dekke," a kind of reading desk used for the reading of the sacred book. No unbeliever can enter here, nor can a Mohammedan without removing his feet covering.

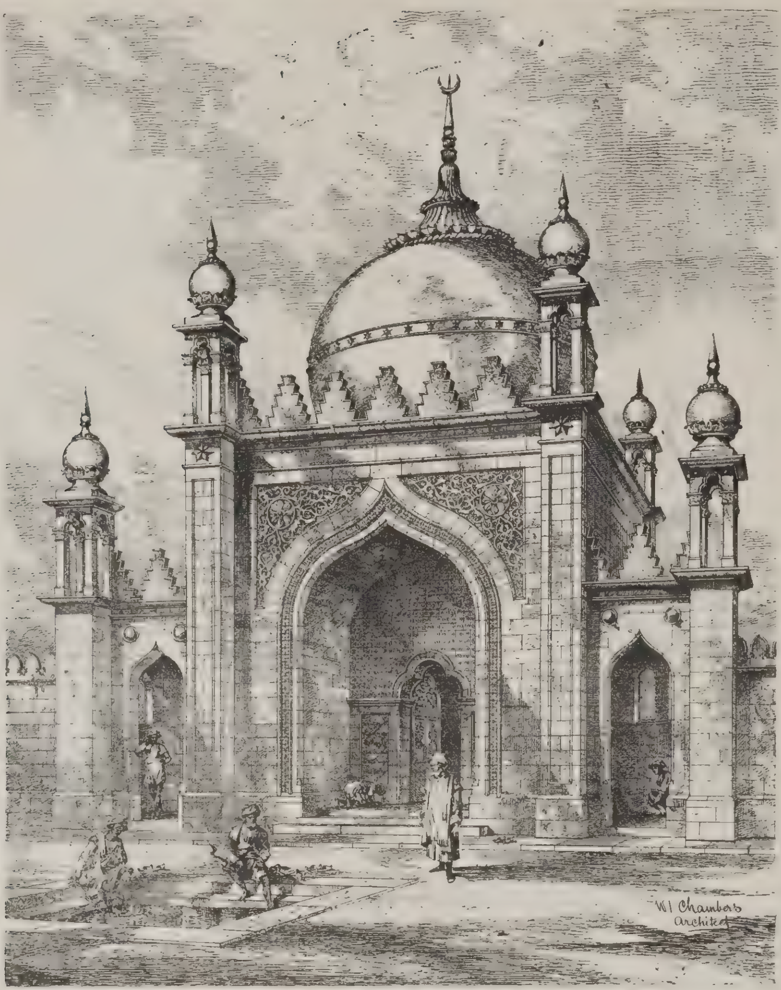
There is also an "estrade," meaning a platform, elevated by one or more steps, corresponding to the narthex of our churches. This is open, next the enclosed space in front of the mosque called the court, wherein is always a well or fountain or reservoir of pure water called the "meidaah," where the faithful can perform their ablutions before entering the mosque. The court can be entered without removal of boots: it corresponds to the court of the Gentiles and is always enclosed. There is generally a portico entrance, and under this portico the learned men give instructions to students; in fact, very often rooms are annexed to this portico for the use of the students.

The Chief Feature.

The chief glory of a mosque, and that calling for the architect's utmost skill, is



PROPOSED MOSQUE FOR LONDON (First Design). W. I. CHAMBERS, ARCHITECT.



MOSQUE AT WOKING. W. I. CHAMBERS, ARCHITECT.

the minaret, a special feature of mosques. The most exquisite of these is said to be that of the mosque of Rani Sipri. The number and position of minarets is a matter of taste; the mosque at Mecca has seven and that of Herat nine; if there is only one it is generally at the side and at a little distance away. The number of the balconies that grace a minaret depends on the taste of the architect and the importance of the building, the balconies being used by the "muezzin" for the purpose of calling the faithful to prayer. The ornament that crowns a minaret (or dome) generally takes the form of a crescent raised on two or three globes; this, however, is not universal, as some have the form of a boat—symbol of the vessel of faith; the various objects in a mosque consecrated to worship have similar terminals. As a rule minarets are more ornamental than the spires of our churches.

When the mosque in London is erected it is hoped that it and Mohammedans will receive every consideration, in view of the fact that the Mohammedan subjects of the King far outnumber Christians or those practising any other form of religion in his dominions.

The architect desires the London mosque to be pure white with the domes gilded. It is thought that Doulton Carrara material, as in the Savoy extension, may be used. Some of those connected with the mosque desire it to be green—the colour of Islam: so probably it will be composed of white and green. In any case, it is bound to be a unique building in the metropolis.

DEAD ARCHITECTURE.*

By Louis H. Gibson.

I know an architect who believes that he can accomplish more for his art by placing himself in sympathy with a body of laymen than by addressing his professional associates. It is his understanding of history that architects merely reflect the spirit of the people.

Institutional methods of education, conspicuously the architectural schools, develop memory and the faculty of imitation. They inculcate great respect, if not reverence, for facts. The pedagogical methods of developing the imitative faculties are wonderfully skilful and ingenious. However, those who see visions find little encouragement in the schools. The dreamer is an outcast, if he be not a giant, and then he will desert or reform the school. Such a one was Richardson, in architecture, and Sullivan. These men knew facts; they had memory; they knew history; they were able to imitate; yet they dreamed, they saw visions, they had ideals. Memory was a resource, the faculty of imitation the medium of expression. Imagination blazed the trail. Dreams led to idealisation; idealisation to manifestation in architecture. In the neglect of the spirit of things, we lose the life of things.

The Stuffed Mind.

Most of our education consists in the consideration of innumerable facts without a proper comprehension of their intimate and logical relation to principle.

It is entirely possible for an architect, for instance, to go through any of the schools of architecture or to know never so well the chronological history of his art, to have stored his mind with great volumes of facts relating to form, colour, decoration, arrangement of details, to have had extensive practice in their imitative use, and yet not understand the underlying principles of architecture. The isolated facts with which he has stored his memory, his theories, examples and the detailed imitative experiences which have come to him are a positive burden without imagination and the constructive sense.

Everlasting Tradition.

Of all the arts, the art of architecture is the least alive. It rests almost wholly upon the traditions of the past. It is the only art where respect for precedent implies bondage. We have music to-day than which the world knows none better. We have literature which is in no way controlled by the past, by memory. We have great paintings not yet dry upon the easel. Sculpture is modern and expressive of present-day emotions. It is not imitative. Only in architectural art do we feign the expressions of the past.

The architecture of the Greeks expressed the sentiment and culture of their civilisation; that of the Romans stood for organisation, formula, control; mediæval architecture was expressive of religion and the sentiment of the Infinite; while the period of the Renaissance was identical with the spirit of research and the retrospective view. But the spirit of the present is not expressed in our architecture. We clothe our thoughts in the tattered, objective garments of the Greek, the Roman, the Mediæval, the Renaissance period.

Two Great Examples.

As illustrative examples, we will consider two great libraries. Our people are at least serious in housing their books. A library building, more than any other, is our most deliberate and painstaking architectural expression.

The library at Washington is the most earnest, artistic effort on the part of our Government in recent years. We made some progress during the time it was building. The structure shows it. The exterior indicates serious and earnest effort, but the result is crude. The composition is not pleasing and the detail is coarse. Those who had general charge of the structure recognised its deficiencies before the building was finished, and a change of scheme was the result. The interior, so far as it was possible to change it within the limits of the structural forms of the previous administration, shows the hand of a master of academic architecture. It is the interpretation of the Renaissance, as seen through the eyes of the Ecole des Beaux-Arts in Paris. From an architectural point of view there is not a spark of originality nor national character within the material form of this building. The floor plan is good, much better than that of the Boston Public Library; the exterior is crude and a part of the interior is masterly, from the French standpoint. It is the Paris Ecole des Beaux-Arts at liberty in America. As we view the work we may well ask, Where are we—Germany, France, Italy, or has an architect gone to Brazil? Where are we? What of American history and American life? Have we done nothing? Have we no history? Have we no individual thought to express? Or have we been taught not to express it? Have we been directed to study only the shell of architecture?

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* Extracts from a paper read at a meeting of the John Herron Art Institute, Indianapolis, Ind.

There is nothing local or American in the decoration of the walls of the Library of Congress. Are our artists not represented on these walls? By masterly technique, yes. By expressions of American life or history, no. The same subjects would do well for a building in a new African province without history, but not for a nation that has lived and builded history in a great way. Here is a list of some of the decorative subjects treated on the walls: Minerva, Writing, Literature, Law, Michael Angelo, Religion, Beethoven, the Graces, the Seasons, the Virtues, Government, &c. Much of this is painted in a great way, so far as mere painting goes, but none of it represents a single thought or characteristic connected with our history or people.

Then turn to the Boston Public Library. The building is a refined Italian importation. It is architecture as it was in the fifteenth century. The general motive of the front is more modern, but all other parts and the detail of all parts are imported directly out of the fifteenth century. There is a great building, but not great expressive art; great painting and drawing, but not great characteristic art. Mr. Sargent, a great technician, represents Eastern or mythological subjects; Pasht, the cat-headed three-eyed goddess, the Ibis of the Nile; Puvis-de-Chavannes paints "the Muses acclaiming Genius, the Messenger of Light."

Where is New England, with its splendid history, its educational work and all that it has done for the civilisation of this country? The people of a hundred years from now will look to the decoration of this building and find nothing of historic interest. They will wonder why the great things of our time or history found no record on the walls of this building.

Old Colonial Houses.

The truest architectural expressions that America has known were to be found in the buildings of the Old Colonial period. The medium was a Renaissance departure, yet material, colour, form were idealised and inspirited to express Old Colonial life. It was careful, thorough, academic house-building. We know the early New England people as thoughtful, refined in a way, very severe and exact: and we find the architecture of that period expressing as clearly as possible all these qualities. There is no suggestion of the picturesque either in the personality or the architecture. There is no mere prettiness. It is truthful, severe and refined. It carries with it a certain reserved, dignified, quiet beauty and nobility which comes from seriousness and concentration. We architects undertake to build Old Colonial houses to-day. We memorise Old Colonial details and imitate the forms. But we do not supply the character.

Distorted Self-Consciousness.

There was a time when Greek and Mediæval and Renaissance art were L'Art Nouveau. The perception of its beauty was the fatal moment. It then ceased to be an unconscious expression. Convulsive clinging to æsthetic effort means loss of real mastery. Our Art Nouveau carries with it a suggestion of failure. It is an exaggerated expression of self-consciousness. In that it clearly expresses a distorted self-consciousness, it is effective. In that the expression of this condition of mind is not desirable, such an expression is out of place: and a thing out of place is never true art. New art is the expression of new thought; the now, and not the taking-on of a new skin.

MANCHESTER ARCHITECTS.

The Sketchers.

The last two sketching excursions of the Manchester Society of Architects have been a great success. Hull was made the headquarters at the Bank Holiday week-end, being a good centre for the fine group of churches in the neighbourhood. Saturday was spent at Beverley, in the Minster and St. Mary's Church. On Sunday the principal buildings in the town were viewed. Hull has been practically rebuilt within recent years, and is now admirably laid out with wide streets and avenues of trees.

The 14th century parish church is the most important ecclesiastical building: there are also St. Mary's, by the late G. E. Street, which has a good covered ambulatory from the tower to the door at the west end, and Mr. Temple Moore's St. Augustine's; this latter still requires the fine tower at the west end, which is shown on a drawing inside the church. The Congregational church of Messrs. Molds & Porrit, octagonal on plan, is in a freer style and admirably meets its requirements. The new School of Art by Messrs. Lanchester, Stewart & Rickards was very greatly admired.

Monday was spent at the beautiful Decorated church at Patrington. Internally, it is not far short of perfection. The nave and choir have curved wooden roofs and the aisles are groined in stone with pleasing variety. The wide transepts enable delightful cross views to be obtained. The piers and arches are all most beautiful in proportion and detail. The transepts are each arranged for three chapels; the north transept now contains the organ, but on the south side the altar of the centre chapel is in an octagonal recess groined over, the large boss at the centre over the altar being hollowed out for a reliquary or tabernacle. The south porch has a parvise over with charming little windows looking into the aisle. "So difficult did we find it to leave Patrington that only half an hour could be spent at Hedon, where the glorious centre tower (Perpendicular) made us regret that sketching on this trip was finished."

On Saturday, August 18th, Bunbury Church, in Cheshire, was the object of getting up at 5.30 a.m. The present building was commenced about 1380 by Sir Hugh Calveley, who founded a college here, but there are sufficient remains to show that a Norman church once existed. There is a fine dignified tower at the west end with buttresses on the west face only, and over the south porch is a statue of St. Boniface, the patron saint. Internally, the nave has very light and graceful Perpendicular shafts. The Egerton Chapel occupies the east end of the south aisle, being separated from the chancel by a fine stone screen, occupying three bays of the arcade. The small oak door to the chapel is made of 1in. planks, beautifully carved with open lattice-work in the upper part, and shields below in very low relief.

Obituary.

Mr. Cornelius Bagot, architect, of Manchester, died recently, aged 68.

Views and Reviews.

Gas Producers.

Gas producers are now in such general use that this book, consisting of hints to users, is welcome. The information is given in the shortest and concisest way.

"Working Hints for Suction Gas Producers," by A. Flurscheim. London: "The Gas & Oil Engine Record," price 1s. nett.

Modern Buildings.

We have already reviewed volumes 1 and 2 of this publication. The third volume, now before us, is divided into three parts—namely, (1) school and hospital planning; (2) the law of easements; (3) heating, ventilating and lighting. The promise of the earlier volumes seems to be sustained, the information offered being practical and concise, while a number of plans by well-known architects of model schools and other buildings are published. The details of fittings are particularly valuable. The plans and details of the British Hospital at Constantinople, of which Mr. H. Percy Adams, F.R.I.B.A., is the architect, are, we are glad to see, included in this volume; a charming perspective of the building is reproduced in colour, and various other coloured plates are included. The law of easements is dealt with by Mr. J. Bridges-Lee, barrister-at-law; the subject of gas fitting and gas lighting by Mr. W. Noakes; and electric lighting by Mr. H. Y. Margary. "Oil Gas" forms the subject of a chapter contributed by Mr. H. Luttrell Godden. The other chapters are anonymously contributed.

"Modern Buildings: their Planning, Construction and Equipment." Vol. III. Edited by G. A. T. Middleton, A.R.I.B.A. London: The Caxton Publishing Co., 84, 85 & 86, Chancery Lane, W.C., price 10s. 6d. nett.

Architects' Joinery.

The publication of a revised edition of this book, which was first issued some years ago, certainly seems to us to deserve the remark that it makes its appearance under false pretences. Mr. Batsford, who issues it, is recognised as a publisher of independent books, yet this is merely the catalogue of a trade firm. The title of the book would lead one to suppose it to be a general treatise on joinery. All the designs illustrated, however, are protected against infringement, and a price-list relating to the different plates is given away with the volume—separately printed it is true, yet evidently part and parcel of the book, because it is referred to in the "Foreword," which itself consists of an offer by the author to submit designs and estimates for joinery work, and a statement of the quality of the materials he supplies. We have no quarrel with the book as a trade catalogue. It is very well produced and many of the designs are good in themselves, and clearly illustrated by means of photographs from actual examples. For the most part the illustrations comprise mouldings and mantels, but there are also shown a few screens, doors and dado panellings.

"Architects' Joinery and its Ornamentation," by F. A. Fawkes. London: B. T. Batsford, price 5s. nett.

A Pocket-Book.

There is undoubtedly an opening for a good pocket-book for the building trades, and we were pleased to see that this book had been published; but we doubt, on closer inspection, if it will fill the want. The author says in his preface: "The work does not pretend to be a text-book on any particular building trade, but it does aim to supply a summary of the leading features in connection with the majority of them as has not hitherto been available, and which will, it is hoped, make it a valuable pocket or desk companion." —We think the book has missed its expressed aim, because there is no proportion observed between the parts of the subject dealt with. It is far too scrappy and, although a good deal of the information is useful in itself, there is a want of completeness and grasp about the whole book, which prevents it being considered an adequate work of reference. It is all very well as providing memoranda supplementary to other aid-books, but it is not all-sufficient in itself. It may not "pretend to be a text-book on any particular building trade," but it certainly often relapses into the text-book style. For instance, we find such trite remarks as the following :—

> A bricklayer is one who understands and can execute, in the best manner possible, the laying of bricks so as to build up the carcase of a building. Bricks may be termed artificial stone, and, being of a uniform size and easily obtained in any part of the country, they enable a building to progress more rapidly than an all-stone structure. Masonry, practically considered, is the art of hewing, shaping, and uniting stones for the various purposes of building. The term "mason" is derived from the French maison, "a house," and denotes a builder. Concrete floors should be light, strong, and able to resist fire. In addition to these qualities, materials must be used to counteract the cross-stress, due to weights placed on floors, in addition to the weight of the floor itself. A floor ought to obtain its support independent of the walls.

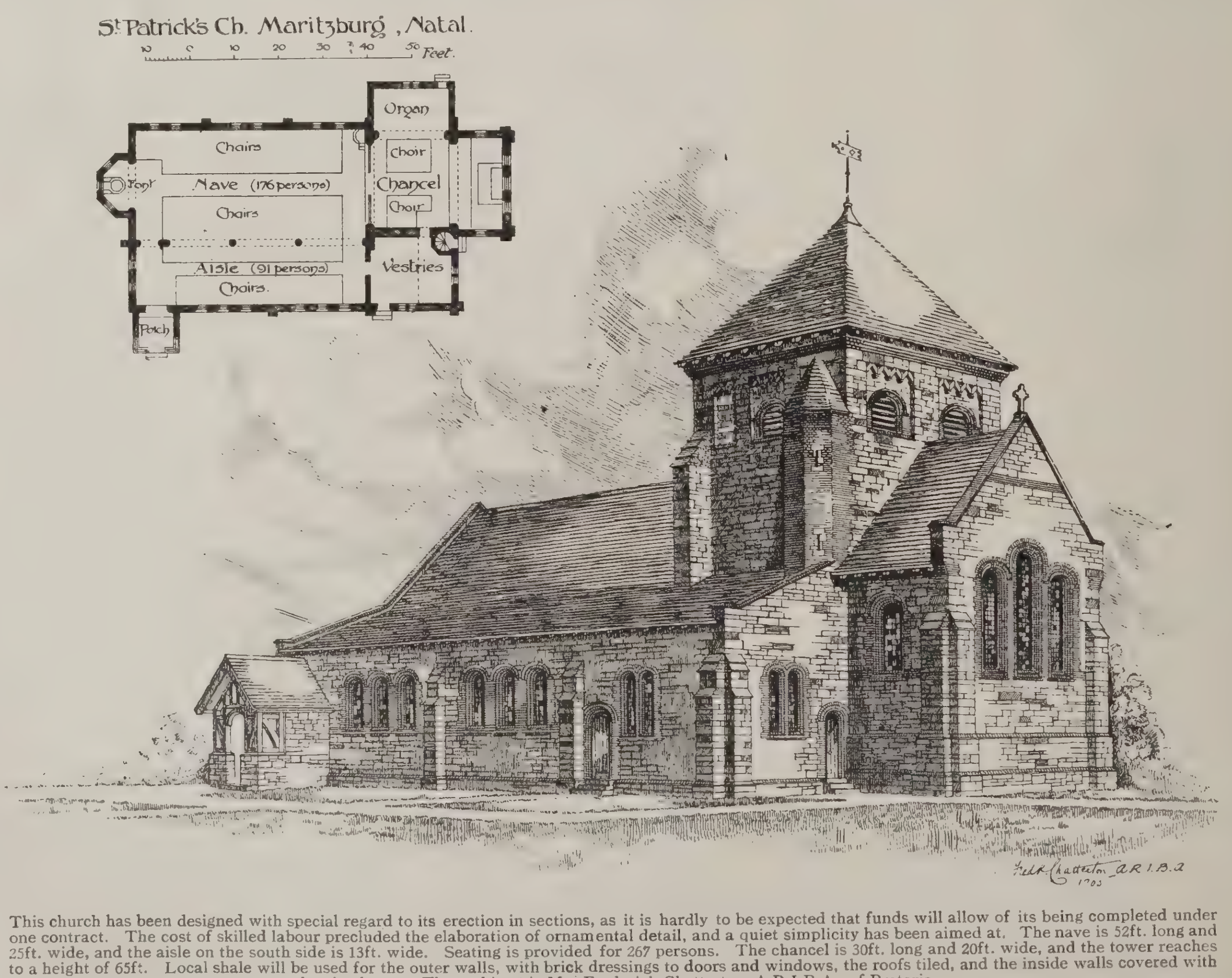
Such definitions as these are altogether out of place in a pocket-book, which is, surely, only supposed to be used as a collection of data and reminder to persons who have already studied the principles of the subject. The book collects together a good deal of information which it is easy to obtain, being found in the majority of pocket-books, such as weights and measures, mensuration, circumference and areas of circles, squares and cubes, logarithms, weight of pipes, strength of ropes and chains, stamp duties, tables of wages, &c. There is nothing to be said against such information; but, as it is to be found in existing books, it is obvious that republication is no distinction or reason for according the book a place; its claims must be based upon the novelty and usefulness of the other information it offers. This, however, consists of a summary of the British standard specification of Portland cement, the report issued by the Home Office on the cause and prevention of accidents in building, the ordinary kind of remarks and drawings about brickwork bond, setting-out of arches, forms of jointing and pointing, specially shaped and moulded glazed bricks, lists of stone and granite quarries, drawings of a few masonry details, the method of setting-out the entasis of a column, the way to enlarge mouldings, method of seasoning timber, bending moments and shear diagrams, joints in woodwork, the R.I.B.A. scale of charges, and so on. There is nothing particularly novel in all this, and we cannot see that it is treated at all informingly; in fact, we would prefer students to consult other works, as much of the information is erroneous, or does not convey the proper view. The book also contains extracts from the London Building Act and other building by-laws, the rules for the building trade of London, hints on restoration published by the Royal Institute of British Architects, the Boston code of professional ethics, and an abstract of the Workmen's Compensation Act, all of which information is easily gathered together and occupies the limited space in the book to the exclusion of information which would be more valuable. Finally the book contains tables on the various periods of architecture, which are altogether superfluous and, indeed, ludicrous. In this part, illustrations of the Orders are included without any figured dimensions or scale. The Doric Order of Vignola is printed upside down, and the others might have been also for all the use they are.

"Fowler's Architects' and Builders' Handbook." Manchester: Scientific Publishing Co.: price 2s. 6d. nett cloth; 3s. 6d. nett leather and gilt edges.

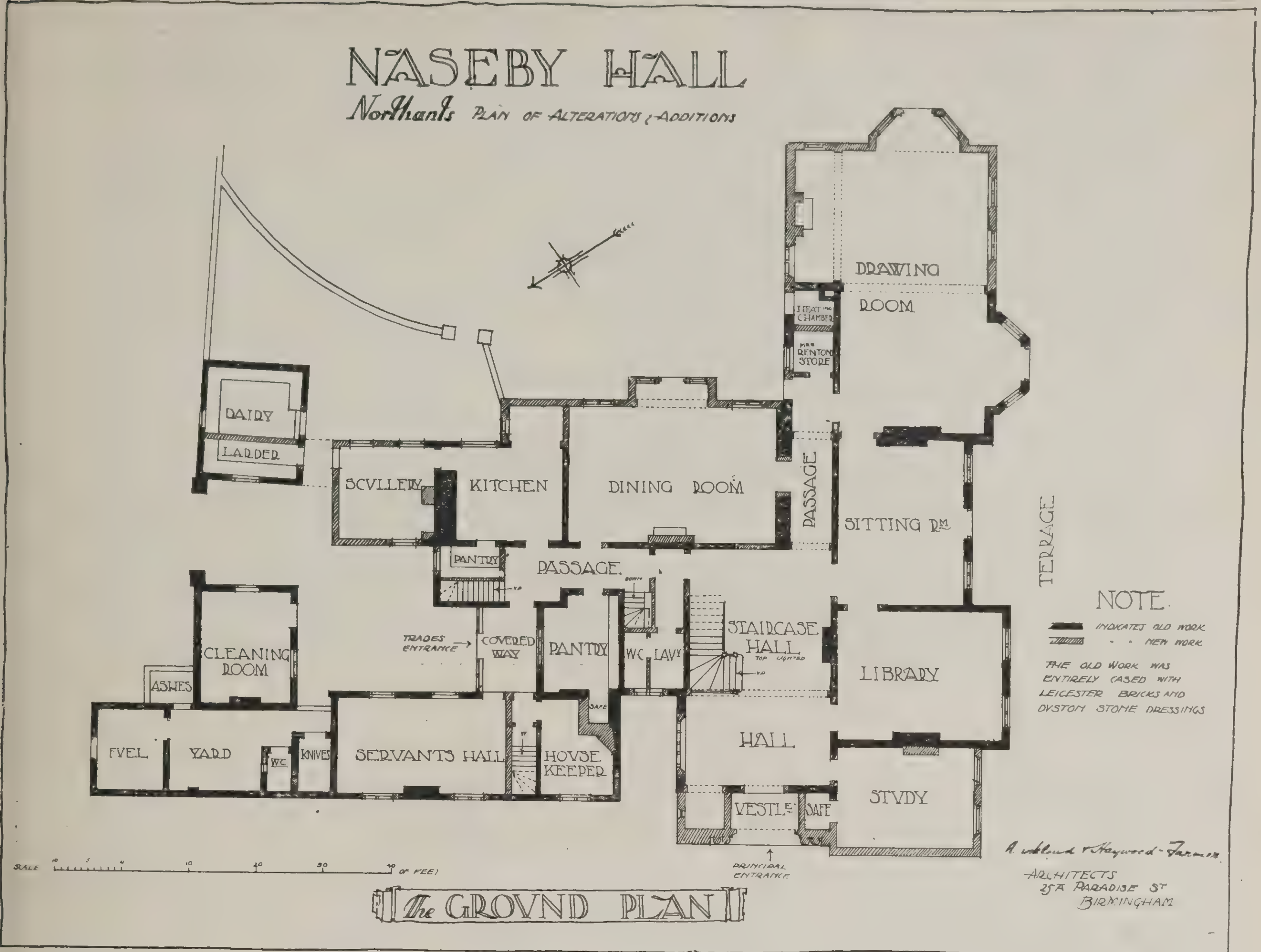
Hot-water Supply.

This book contains records of original research and remarks on the lessons to be drawn therefrom, which are deserving of careful study by all interested in the subject. Mr. Sayers, who is the lecturer on plumbing at the Municipal Institute, Belfast, fitted up for the instruction of his students a complete full-sized hot-water system, and by arranging the pipes differently, inserting glass tubes so as to show the flow of the water, and also thermometers at points to record the temperature, elicited much practical information and determined obscure points. In fact, Mr. Sayer has cleared up the whole subject very thoroughly, and his records of the experiments form most interesting reading, particularly as he has so plainly drawn the lessons to be learned.

"Experiments on Hot Water Systems," by A. Sayers. London: Sanitary Publishing Co., Ltd. Belfast: W. Erskine Mayne. Price 3/6 nett.



This church has been designed with special regard to its erection in sections, as it is hardly to be expected that funds will allow of its being completed under one contract. The cost of skilled labour precluded the elaboration of ornamental detail, and a quiet simplicity has been aimed at. The nave is 52ft. long and 25ft. wide, and the aisle on the south side is 13ft. wide. Seating is provided for 267 persons. The chancel is 30ft. long and 20ft. wide, and the tower reaches to a height of 65ft. Local shale will be used for the outer walls, with brick dressings to doors and windows, the roofs tiled, and the inside walls covered with asbestic plaster. The architect is Mr. Frederick Chatterton, A.R.I.B.A., of Pretoria.



Our Plates

The alterations and additions made to Naseby Hall, Northants, by Messrs. Buckland & Farmer, architects, of Birmingham, are clearly shown by the above plan, and by the perspective illustration given as a centre plate, so that there is hardly any need for any detailed description of the work. The old work was entirely encased with Leicester bricks and Duston stone dressings.

Notes and News

Municipal Flats.—Pond House, Pond Place, Chelsea, is a block of municipal flats just erected in the borough.

The New Central Criminal Court in Old Bailey, it is stated, will be ready for opening before the end of October.

The historic walls of Cadiz are being pulled down. It has long been the dream of the people of Cadiz to demolish these picturesque but useless walls, to make room for factories and modern buildings.

The Birthplace of William Wilberforce, an Elizabethan mansion in High Street, Hull, has been acquired by the Hull Corporation and converted into a museum, in which objects illustrative of the history of Hull will be collected. It was opened on Friday last.

Manchester School of Technology: Architects' Fees.—At a meeting of the Manchester Education Committee held last Wednesday it was resolved to allow 1,000 guineas in satisfaction of a claim by Messrs. Spalding & Spalding, the architects, as extra remuneration in connection with the new Municipal School of Technology.

The enlargement of the Paddington Town Hall, Harrow Road, rendered necessary by the growth of municipal work and an increased staff of officials, is now nearly completed. The alterations made include the provision of a spacious semi-circular council chamber, for the fitting and furnishing of which £3,000 has been voted.

New Church at Ross.—In the paragraph about this new church on p. 55 of our issue for August 1st it was stated that the oak screen was made by Mr. Clarke, of Hereford. This is not correct, for Mr. F. Dredge, of "Ye Antique Furniture Shoppe," Hereford, writes to say that he made the screen, and also the altar in the church.

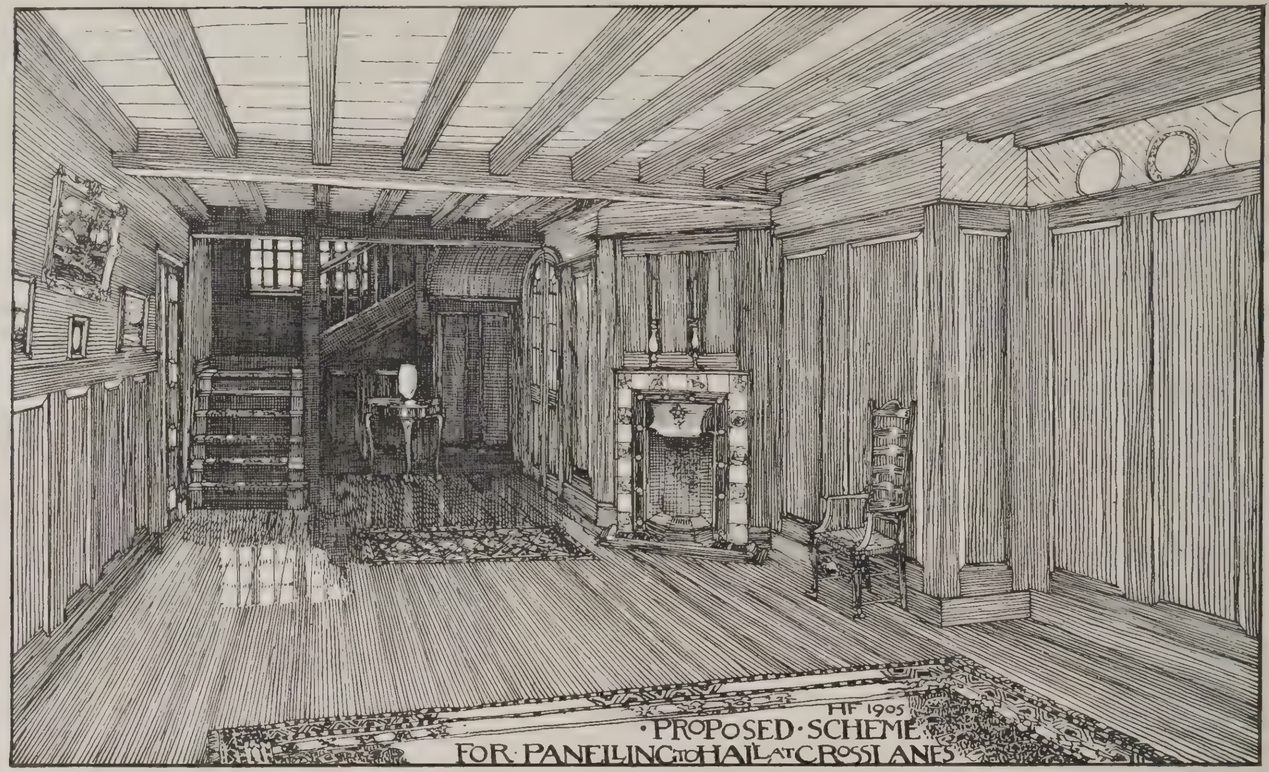
Another Garden City.—The Vale Farm, a beautiful well-timbered estate adjoining Pinner Road, Sudbury, near Wembley, has been acquired for the purpose of development as a garden city. The plans provide for the erection of a theatre and restaurant, but it is not intended that factories shall be built, as the site is to be utilised for residential purposes only.

For the Treatment of Pauper Lunatics an asylum is being completed at Bangour, near Edinburgh, at an estimated total cost of £300,000. The architect for the work is Mr. Hippolyte J. Blanc, R.S.A., of Edinburgh. The formal opening ceremony will take place in October. The various buildings are disposed over a large area, and everything is done to make the place look cheerful.

Contract for Rebuilding of Gloucester House, Piccadilly.—Messrs. Patman & Fotheringham, Ltd., of 100 and 102, Theobald's Road, W.C., have secured the large contract for the rebuilding of Gloucester House, Piccadilly, W. (the late Duke of Cambridge's residence), for J. J. Duveen, Esq., of Messrs. Duveen Bros., Bond Street, W. The architects are Messrs. Collcutt & Hamp, Bloomsbury Square, W.C.

The Cathedrals of England and Wales.—Mr. T. Francis Bumpas has now completed his history of the cathedrals of England and Wales, and the third and final volume will be published by Mr. Werner Laurie, Clifford's Inn, in a week or two. The contents include Lichfield, Gloucester, Rochester, Carlisle, Oxford, and a number of the minor cathedrals. The book is illustrated with 32 plates in two colours.

King's College Hospital.—Half of the £300,000 required for the erection of the new hospital at Camberwell has now been subscribed, and in all probability the new building will be commenced before the end of the present year. The out-patients' department is to be erected first, and the wards and administrative section will follow as further funds permit. The architect is Mr. William A. Pite, F.R.I.B.A., whose design was selected in limited competition.


HF 1905
·PROPOSED·SCHEME·
FOR·PANELLING TO HALL AT CROSSLANES

NIVEN, WIGGLESWORTH & FALKNER, ARCHITECTS.

This scheme has been carried out by Messrs. H. & E. Dyer, of Alton, with old panelling supplied by Mr. H. J. Baker, the owner of "Crosslanes," which is a house at Frensham, near Farnham, in Surrey.

IRISH NOTES.

Architectural Home Rule for Ulster.

Under this heading in its current issue "The Irish Builder and Engineer" deals with the breaking-away of the Ulster Society of Architects from the Royal Institute of the Architects of Ireland. Our contemporary says:—"It is but a few years ago that the Irish Institute, at the request of a number of its Ulster members, consented to the formation of a branch society, affiliated to itself, and known as the Ulster Society of Architects. During the comparatively short time it has been in existence, the younger body has doubtless shown considerable vigour and energy, much of which it owes to the zeal of the ex-president, Mr. W. J. Gilliland. It has initiated classes for students, many of whom have successfully passed the British Institute examinations, and has generally interested itself in the important question of architectural education to an extent that favourably compares with the belated activity of the senior institution. On broad professional grounds it is, therefore, most regrettable that this vigorous body of architects in the North should seek to go its own way and withdraw what might prove, if properly applied, a most helpful influence in the counsels and actions of the Irish Institute. It is still more lamentable that the division should occur at the present moment when the registration question is under consideration, and a proposal to found a chair of architecture at Trinity College, and the initiation of a scheme of Irish examinations, are forming subjects of discussion between the R.I.A.I. and the Irish Architectural Association. There seems in this country at present to be a general desire to call for a higher recognition of architecture as a profession, and to raise it from the somewhat debased position it has held in the public eye for the last quarter of a century. To achieve the required results, unity is essential, and we must confess that the action of the Northern society could scarcely have occurred at a more unpropitious time.

"From a narrow aspect there is little question that the Irish Institute, as a society, will benefit by the dissolution. Since the formation of the Northern body, the latter has arrogated to itself functions which should, in equity, have been left to the parent institution; and far-reaching resolutions have been passed of major importance —*e.g.*, the 4 per cent. resolution, and that dealing with building contracts—without any prior reference to the R.I.A.I. Indeed, we know that the senior society has on many occasions felt itself hampered by the hostility which the Ulster Society has endeavoured but thinly to disguise.

"It may be assumed that the Ulster Society will now seek direct affiliation to the British Institute, and we expect no more than a dignified protest from the Irish Institute at the methods by which the dissolution has been achieved. We fear the split has gone too far for other counsels to prevail, but it is difficult to prophecy to what extent the R.I.A.I. will be numerically weakened. There is no doubt, however, that its remaining members will be more firmly knit together, now that a cause of dissension is removed, and we anticipate that, pursuing its present policy of dealing with architectural matters, and by the infusion of a little more energy into its actions, the Royal Institute of the Architects of Ireland will lose little, if any, of its influence as the representative body for the profession in this country."

A Criticism of the Belfast City Hall.

In the same issue of the "Irish Builder" there is the following criticism of the huge new City Hall which has just been completed at Belfast, from designs by Mr. A. Brumwell Thomas, of Westminster, whose design was selected in competition more than ten years ago:—

"Our Belfast correspondent . . . drew attention to the faultiness in artistic principle of the barrel-roofed portes-cochère, or porticos, as the case may be, which embellish more than one facade of the new building, as blemishes on the general effect of the design; and he also deprecated the meandering walks, amidst indiscriminate patches of grass lawn, which disfigure the surrounding ground. We have since looked through some of the photographs, and we cannot help agreeing with our correspondent's strictures. We have not been grudging in our own praise of this truly noble municipal edifice . . . but we look forward to the time when the porte-cochère and the protruding portico will be removed. They mar the noble lines of the main building. The walks are beneath criticism, and it is doubtful that the architect could have been consulted in reference thereto. The only defect which strikes us in the main facade (always excepting the lack of the base, or plinth, alluded to by our Belfast correspondent) is the somewhat abrupt way in which the line set by the tall circular windows of the first floor ranges with the smaller windows of the end wings: this, we fancy, leads to some loss of breadth and dignity. The problem was a difficult one, and the result realised has so greatly exceeded anything that could have reasonably been expected that the architect need not cavil at these few comments. The effect of the central statue is, however, far from pleasing, blotting out as it does the chief entrance. The want of a great and imposing central doorway will be by some regarded as a loss; but the tendency, one might say the besetting weakness, of English architecture has ever been to lose sight of the value of this ennobling feature, of which such important use was formerly, and still is, made by French architects."

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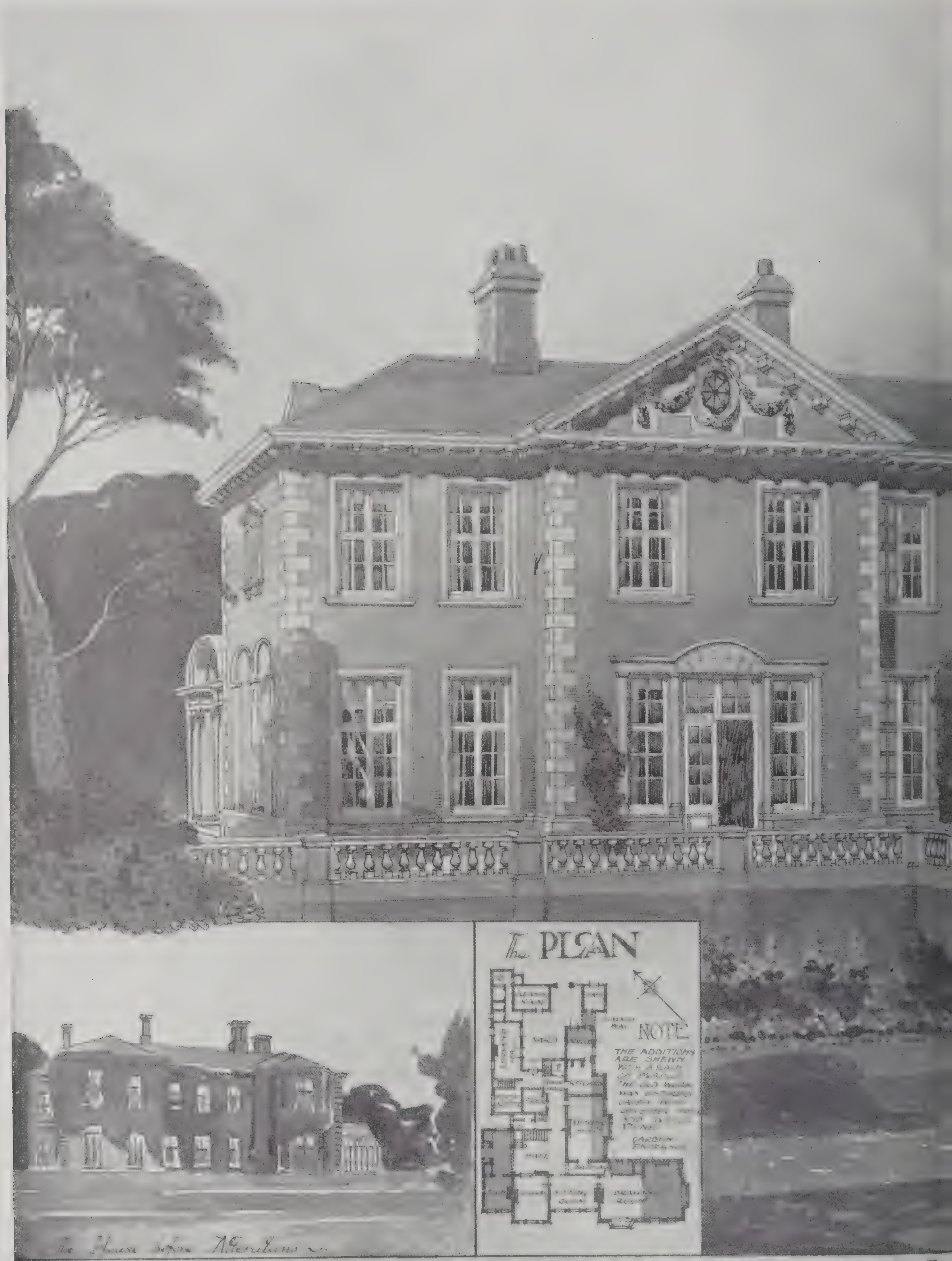
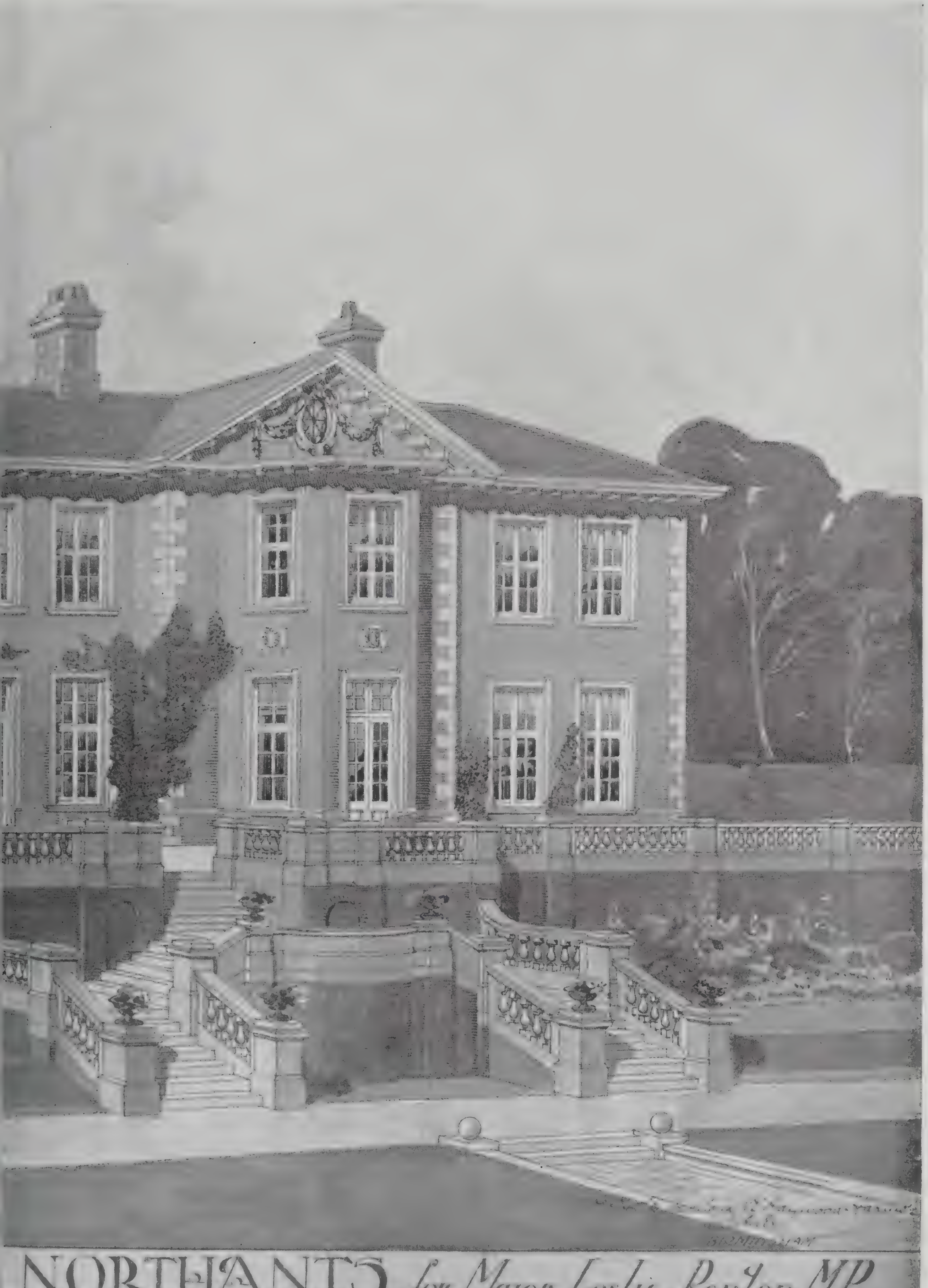
Supplement to
The Builders' Journal and Architectural Engineer.
Wednesday, August 29th, 1906.



Alterations & Additions to NASEBY HAL

HERBERT T. BUCKLAND and


NORTHANTS for Major Leslie Renton M.P.
BIRMINGHAM

OOD-FARMER, ARCHITECTS.

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Enquiries Answered.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional, or legal matters.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Sketching Tour in Wilts, Gloucestershire and Berks.

FARNHAM.—LISAK writes: "Will you please advise as to a cycling tour through Wiltshire, Gloucestershire and Berkshire. What should I see, sketch and measure in these counties as likely to be of help to me in working up for the Intermediate Examination of the R.I.B.A.?"

The following list gives the more important remains of domestic work in Wiltshire. *Fourteenth Century*:—Stanton St. Quentin; Place House, Tisbury; Woodlands, Mere; Barton Farm, Bradford; Wardour Castle. *Fifteenth Century*:—Great Chaldfield; Norrington; Pottern; Salisbury, houses in Close and City; South Wraxall (remodelled in the reigns of Henry VIII., Elizabeth and James I). *Sixteenth Century and later*:—Bradford, Dukes' House; Charlton, Corsham, Littlecot, Longleat, near Warmington; Longford; Wilton. Monastic remains will be found at Malmesbury in the form of an abbey with its conventual buildings. Laycock retains its fifteenth-century cloisters and its thirteenth-century chapter-house and kitchen. Bradenstoke has some excellent remains of domestic buildings of the fourteenth century. The churches of St. Mary, Crickdale, and St. Mary, Devizes, which are chiefly Perpendicular in style, possess fine, rich, lofty towers. Cruciform churches will be found at St. Sampson's, Crickdale; Bishop's Cannings, St. John's, Devizes; Purton, Downton, Heytesbury, Great Bedwin, Wanborough. Pyramidical bell towers are to be seen at the churches at Acton, Turvil, Sutton Benger, Corsley, Biddestone and Great Chaldfield. Stone spires are to be found at Chilmark; St. Martin's, Salisbury; Trowbridge, Chippenham, Box, Purton and Bishop's Cannings. There is good Norman work at St. John's and St. Mary's, Devizes; Corsham and Preshute; and Transitional work at Ogbourne and in the nave of Great Bedwin. At Britford and North Barcombe is work which has a Saxon appearance. Salisbury Cathedral, of course, is unrivalled as an Early English example on a large scale. Bishop's Cannings and Pottern have fine churches in the Early English style in a very well preserved condition. Very good work of the same period is to be found at Purton, Downton, Ambresbury, St. Sampson's (Crickdale), Collingbourne-Kingston, St. Martin's (Salisbury) and in the chancel of Great Bedwin. There is good Decorated work at St. Sampson's (Crickdale), where the windows are particularly beautiful. There is very little fourteenth-century work in this county. Good vaulting is to be seen at Devizes, Bishop's Cannings, Urchfont and Marlborough. Gloucestershire is particularly rich in abbeys. They were: Gloucester, Llanthony, Tewkesbury, Cirencester, Hayles, Flaxley, Kingswood, Winchcombe and Bristol. The churches most deserving attention are Almondsbury, Berkby, Bibury, Bisley, Buckland, Campden, Charlton Kings, Cheltenham, Cirencester, Cleeves, Deerhurst, Dytham, Elkstone, Fairford, Gloucester, Henbury, Highnam, Kemeston, Lechlade, Leonard Stanley, Marshfield, Minchinghampton, Naunton, Newland, Northleach, Ozleworth, Painswick, Pucklechurch, Rendcombe, Redcliffe, Rodmarton, St. Briavels, Stow, Sudeley, Slimbridge, St. Augustine's, Tewkesbury, Thornbury, Tiddenham, Winchcombe, Wooton-under-Edge. Its priories subordinate to foreign monasteries were Beckford, Brimpsfield, Deerhurst, Horseley, Minchinghampton and Newent. Further information concerning the Gloucester district will be found in the "Enquiries Answered" column of this journal for July 4th last. In Berkshire there are several remains of good castellated work. Of these Windsor Castle is the finest. A fragment of a tower with a fine oriel window is to be seen at Wallingford, at Dorrington there is a picturesque gateway, and at Shillingford some chimneys. The oldest manor house in Berkshire is at Appleton, near Abingdon, supposed to be *temp.* Henry II. East Hundred retains its thirteenth-century chapel. Tyfield has a solar in a very perfect state, and the hall has Decorated doorways. There are remains of Tudor houses at Wytham, Sutton Courtenay, near Abingdon, and at Little Shefford, near Newbury. The beautiful old timber mansion of the Norreys family at Ockswells and Ufton Court, the home of Pope's "Arabella Termor," are still in existence, both being used as farm-houses. Shaw House, near Newbury, is a good specimen of the Elizabethan period. The principal monastic remains are those of Abingdon, where the gatehouse and some portions of the chapter-house still remain, and Reading, where the abbey mills and other small portions are still standing. The doorway and tower of Bisham are built into a beautiful but later manor house. Small traces of a Benedictine monastery are left at Hurley, and the church of the Grey Friars at Reading has been restored. Of the churches of Berkshire, Avington is a very perfect specimen of early Norman work. The little church of Padsworth, though much injured, presents some good Norman details. Uffington has a fine Early English church. Shottesbrooke is a specimen of Decorated work; and St. George's Chapel, Windsor, is Perpendicular. The churches of St. Helen's, Abingdon, Wantage, Faringdon, Bisham and Sonning are of much interest. Welford and Shefford have ancient round towers. Tidmarsh and Pemenham have circular apses. Fonts are to be found at Appleford, Eaton-Hastings, Finchampstead, Purley, Great Shefford, Welford and Clewer—Norman. Englefield, Hatford, Wantage, Childrey, Long Wittenham and Woolhampton—Early English. Ardington and Buckland—Decorated. Chievelley, Compton, Beauchamp, Denchworth, Hogbourn, Hurley, St. Lawrence and St. Mary, Reading; Steventon—Perpendicular. Glass of fourteenth-century date is to be seen at Basildon, Brightwell, Hogborn, Long Wittenham and North Moreton; and of fifteenth-century date at Titchcombe Regis, Shillingford, Sutton-Courtenay and St. George's Chapel, Windsor. Tombs of the thirteenth century are to be found at Cumnor and Didcot; of the fourteenth century at Aldworth (very remarkable), Hatford, Sparsholt (wooden effigies), Sonning and Wantage; and of the fifteenth century at Englefield, Fyfield, Windsor and Little Wittenham. Brasses are to be seen at Blewbury, Bray, Childrey, West Hanney, East Hundred, Lanbourne, Shottesbrooke, Wantage, Windsor and Little Wittenham.

You had better select one or more examples in accordance with the R.I.B.A. regulations and measure them up and plot them — if time permits — on the spot. Sketch and see as much as you possibly can according to the time at your disposal. Space does not permit a list of addresses of persons to whom you should apply for permission to sketch and measure, but you will probably have no difficulty in obtaining permission on the spot. If there are any places you are particularly anxious to measure, the addresses of the owners will be found in Kelly's Directories of the various counties. H. Y. M.

Buildings to Measure at Bournemouth, Aberdare, Shepton Mallet, Sudbury, and Bedford.

CARDIFF.—PROBATIONER writes: "What places and buildings in the vicinity of Bournemouth are worth a visit for sketching, and is it necessary to obtain permission beforehand to visit?"

St. Peter's Church, Bournemouth, is worth a visit. It is usually considered the most successful work of Street. Christchurch is perhaps the most interesting place in the neighbourhood of Bournemouth. It possesses two churches. The church on the bank of the Avon is principally Norman and Perpendicular. The outline is somewhat disappointing. The gigantic Early English north porch, the rich circular north turret at the east angle of the north transept, and St. Michael's loft above the Lady chapel should be especially noted. The building forms one of the best examples of the union of a monastic and a parochial church. Topley Church contains work of the Early English and Perpendicular periods. The names of persons to whom you must apply for permission to sketch will be found in Kelly's Directories of the counties. Permission is rarely necessary, except in the case of private residences.

ABERDARE.—SET SQUARE writes: "Are there any buildings in or near the following towns suitable for measuring for the R.I.B.A. Intermediate Examination: Aberdare, Shepton Mallet, Somersetshire, and Sudbury in Suffolk?"

At Aberdare there are two churches, of which St. Elvan's is a handsome Decorated building. There is very little else in this neighbourhood. In the neighbourhood of Shepton Mallet are the cathedral of Wells and Glastonbury Abbey. The church of Shepton Mallet is a very fine example of Early English work, with one of the most beautiful timber roofs in the country, and in the chancel there is a very fine Early English piscina. This roof contains 350 panels, no two being alike. In the market place is a cross worth noting, erected 1500 and restored 1841. The village of Croscombe possesses an Early English and Perpendicular church and a cross. The church has a stone spire—an unusual feature in this part of the country. The arcades are Perpendicular and the south door is Early English. The rich battlements should also be noted. The church contains an extraordinary amount of fine woodwork in the form of seats, bench-ends, &c., among which the truly magnificent cinque-cento pulpit, bearing Bishop Lake's arms and the date 1616, and the chancel screen, rising nearly to the roof of the church, deserve special notice. The roof of the chancel is of the same date as the pulpit. The belfry has a fan vault. Croscombe is full of old houses, of which the village inn is of fifteenth-century date and deserves attention. It has a good bay window with a carved stone ceiling, good fireplaces and panelled ceilings to the chief rooms. Good churches are to be seen at Dinder and Pilton. Sudbury has three churches—All Saints', St. Gregory's, and St. Peter's. All Saints' is Perpendicular with a Decorated chancel with a very good roof and screen work and an oaken pulpit dated 1490. St. Gregory's and St. Peter's churches are Perpendicular. The Perpendicular gate of St. Gregory's College is still standing. At Borley is a church containing a fine Elizabethan monument. Twinstead Hall is a large Elizabethan mansion. Bure St. Mary possesses a church which is chiefly Decorated in style. Churches will also be found at Mount Bures, Little Horkesley, Middleton and Beauchamp Walters. The names of the persons to whom you must write for permission to sketch will be found in Kelly's Directories for the counties. Permission is rarely necessary, except in the case of private residences.

CLECKHEATON.—SPEN writes: "Please name a few old and new buildings round about Bedford, Dunstable and Biggleswade suitable for measured drawings. Also, where must I apply for permission to visit Hatfield House?"

At Elston, one and a half miles south of Bedford, are a church and some Renaissance remains of a priory. A little ancient work is to be seen at the Churches of St. Mary and St. Peter, Bedford. At Clapham, one and a half miles north of Bedford, is a church dedicated to St. Thomas of Canterbury, with a Saxon tower and an Early English nave and chancel (restored by Sir Gilbert Scott), and possessing a fine monument attributed to Grinling Gibbons. At Biddenham the Church of St. James contains work of the Norman, Decorated and Perpendicular periods and has a curious hagioscope on the north side. St. Owen's Church, Bromham, has a Decorated arcade and a Perpendicular tower. Kempston Church has Norman chancel and tower arches, Decorated nave arcade and Perpendicular windows. Willshampstead Church contains Early English, Decorated and Perpendicular work. At Biggleswade is the Perpendicular Church of St. Andrew with an earlier south door. An Early Decorated church is to be seen at Eyworth. Langworth contains a good Decorated and Perpendicular church with a fine rood screen. The Church of St. Peter at Arlesby contains Early English and Decorated work and a Tudor chapel. St. Mary's Church, Stotford, is chiefly Decorated, but the nave is Early English. Some curious mural paintings and carved work are to be seen here. The Perpendicular church of St. Leonard at Old Warden has been fitted with oak carvings and various enrichments, brought from various parts of the Continent, and is well worth a visit. At Cardington the Church of St. Mary has a good nave arcade, a central Early English tower, and a Perpendicular chancel. All Saints' Church, Caple, is a fine example of Perpendicular work. At Dunstable are some fine remains of the Priory Church of St. Peter and St. Paul. The nave and great portals are Norman, the west front is Early English, the north aisle and upper part of north-west tower are Perpendicular. At Totternhoe is the Perpendicular church of St. Giles. The church of St. Mary, Eaton Bray, contains Early English work (nave, arches and font) and Perpendicular work (chancel, aisles and clearstory). The church of St. Michael, Houghton Regis, is chiefly Decorated, and in the south aisle is a very good Perpendicular tomb to Sir John Sewel. At Luton is the very fine church of St. Mary, of which the tower is partly Decorated and partly Perpendicular, and the nave, arcades and transepts are Decorated with some Early English portions. The addresses of persons to whom application should be made for permission to sketch will be found in Kelly's Directories of the counties. Permission to sketch is very rarely required except when it is desired to sketch private residences.

H. Y. M.

Wilstead.

CAVERSHAM.—C. B. W. writes: "Is there any building within about eight miles of Reading suitable to measure for the R.I.B.A. Intermediate Examination?"

See answer to enquiry under the heading of "Tours in Berks, Wilts and Gloucestershire," on preceding page.

Scales.

PORT TALBOT.—W. J. J. writes: "Does any book deal solely with scales, giving details how to read them?"

We do not know of one.

Portland Cement Tennis Court.

PORTLAND writes: "A Portland cement tennis court (100ft. by 50ft., laid to slight fall towards centre channel in the width of the court) formed with 6-in. cement concrete bottom, a rendering coat about ¾in. thick of cement and sand, finished with a setting coat average ⅛in. thick of neat cement, was laid and completed about the end of September last. The setting coat almost immediately began to crack, and by the end of the winter about ⅓in. of the setting coat had flaked off and some of the rendering was also cracked, but the concrete had not settled. The whole court was thoroughly repaired with specially selected cement at the end of May and has again cracked in several places. What is the cause of this, and how can a permanent smooth surface of cement be assured? (Samples sent.)"

From the samples sent we think the primary cause of failure has been the application of the cement and sand coat after the bottom layer of concrete had become dry. It should have been put on when green. The final finish of neat cement, about ⅛in. thick, had no particular advantage, and as good a surface could have been obtained by trowelling the surface of the intermediate layer. Sand is not a particularly suitable aggregate to use for a surface coating unless used with care and knowledge. It would be better, in an ordinary way, to use fine granite chippings. If sand is added, it should be only for the purpose of filling the interstices in a large aggregate. To get the finishing coat to adhere to the under-surface it should be picked, carefully washed free from the slightest trace of dirt, and kept soaked with water for some days. The top coat should be of greater thickness than ¾in.—say 1½in., and proportioned 1 to 1. After the surface has set, and while yet green, it should be covered with a layer of sand, which should be kept continually wet by means of a hose for a week at least.

Scottish Measurers for English Work.

AIRDRIE.—FOX writes: "I am a measurer, trained under the Glasgow mode of measurement. Would I have any difficulty in obtaining a situation in a quantity surveyor's office in London? I have ten years' experience and hold good testimonials."

The difference between the Glasgow mode of measurement and that of London is so great that it is extremely doubtful whether you would succeed in obtaining a situation in a London quantity surveyor's office.

W. E. D.

Timber Calculator.

TREDEGAR.—M.J.M. writes: "Please let me know whether there is a useful and concise timber calculator."

The best book for your purpose is "The Practical Timber Merchant," by W. Richardson, comprising useful tables for all purposes connected with the timber trade. The price is 3s. 6d. It can be obtained from these offices, or from Mr. B. T. Batsford, 94, High Holborn, W.C.

THE GLASGOW SCHOOL OF ARCHITECTURE.

The syllabus for the next session of the Glasgow School of Architecture, which is under the direction of a joint committee representing the Glasgow and West of Scotland Technical College and the Glasgow School of Art, has just been issued. There are two courses of study, one for a diploma—strongly recommended to students wishing to qualify as architects—and the other for a certificate, of lesser requirement, and arranged for evening students who cannot give the time in the day required for the diploma course. Special courses of study have also been provided: (1) for architectural students who, in exceptional circumstances, take some of the classes only, and (2) for students of the painting, modelling and decorative art classes of the School of Art, and for students in various departments of the Technical College who require some architectural instruction (measurers, builders, engineers, &c.). Both diploma and certificate courses prepare for the examinations of the Royal Institute of British Architects. The next term begins on September 25th at the Technical College and, for some subjects, on September 6th at the School of Art. The Director is Professor Eugène Bourdon, B.A., A.D.F.G. In the School of Art, architectural design is under the direction of Mr. Alex. M'Gibbon as professor, with Mr. Walter R. Watson as instructor, while in the Technical College these two positions are filled respectively by Prof. Charles Gourlay and Mr. James S. Boyd.

A New Roman Catholic Church at Wellington, Salop, has been erected at a cost of £4,500, accommodating 350 persons. Mr. Myles Morley was the architect up to last Christmas, after which date Messrs. E. Kirby & Sons, of Liverpool, supervised the work. Mr. W. Skellorn, of Stafford, was the builder.

Henley Bridge, erected in 1786 at a cost of £10,000, is in a dangerous condition, and a diver is now daily engaged building up a bulwark of cement-concrete bagging to protect the exposed sub-structure. Meanwhile the Corporation is considering the best method of remedying the defects in the superstructure.

Trade and Craft.

A Builders' Price-List.

Messrs. Young & Marten, Ltd., the well-known builders' merchants of Stratford, London, have just issued a pocket price-list for the building trades. It is thoroughly up to date, and to ordinary members of the building trade will prove most valuable. The prices are given at lowest nett rates, and the selection embodied is one in much demand for present-day villa property. A copy will be sent free on application to Messrs. Young & Marten.

Decorative Cast-Iron Work.

The Carron Company is one of the oldest ornamental ironfounders in the kingdom, having been incorporated by Royal Charter in 1773. Many of the designs which the firm produced more than a century ago are most admirable specimens of art, and it is a stroke of luck that we are still able to obtain these patterns from the company, who have just issued a new catalogue of a good many of the designs in firegrates executed in the early period of their history. The designs are from original carvings done at Carron more than 100 years ago by William and Henry Haworth (students of the Royal Academy during the presidency of Sir Joshua Reynolds), as well as other eminent artists. Their work clearly shows that they were influenced by Flaxman, the brothers Adam, and other artists of the period, who stamped a distinctive style upon their generation. These carvings are careful and masterly studies, perfect in the smallest detail, so that it is a pleasure to study them closely. Whilst the old-time style of these grates has been strictly adhered to, their general construction has of course been modernised to meet present-day requirements. The good taste displayed by the Carron Company in giving the public and the architectural profession the chance of obtaining such artistic productions deserves every support, and we can only hope that their enterprise may be financially remunerative. The illustrations published in the catalogue should be carefully looked at by anyone requiring good firegrates, and it would be well to keep a copy for reference. The catalogue can be obtained from the works at Carron, Stirlingshire, or from the London offices of the firm at 15, Upper Thames Street, E.C., or 23, Princes Street, Cavendish Square, W., where there are showrooms that would well repay a visit. The glories (!) of the Victorian era are fast disappearing, and we have instead either replicas of an earlier age when better taste prevailed, or designs frankly modern and expressive of to-day. For that change all architects must be profoundly thankful.

"Velure."

"Velure," the well-known paint manufactured by Messrs. C. Chancellor & Co., of 13, Clerkenwell Road, London, E.C., is certainly remarkably elastic. One coat applied to a piece of tin with an ordinary brush will not crack, peel, blister or fade, even if the tin is bent in all directions, placed in boiling water, or exposed to frost. It is claimed that "Velure" retains—far longer than other paints—a perfect surface, free from flaws or cracks. It is, therefore, a most sanitary paint, and easily kept clean. It is far better to use a ready-made paint manufactured by a specialist firm who have studied the chemistry and physics of the subject than to rely upon the ordinary mixture by a journeyman painter. "Velure" has come into some considerable use. Obviously it offers advantages both in economy and durability. It requires no admixture of oil, turps, dryers, &c. If it is desirable to thin it, a special "Velure thinner" is supplied by the manufacturers, who also produce "Stripso," one of the best known and most efficient paint-removers on the market. With "Stripso" all that is necessary is to spread a coat of it evenly over the surface, with a fibre brush for preference (ordinary hair or bristle brushes are liable to be ruined unless carefully rinsed after use). The coat is then left on until the paint, varnish or enamel is destroyed. The time taken to do this will vary according to the number and age of the coats to be removed. "Stripso" also removes rust, grease and smoke stains, and, diluted, will serve to clean dirt from paint without injury to the latter.

A New Radiator.

Messrs. Arthur L. Gibson & Co., of 19, 20 and 21, Tower Street, Upper St. Martin's Lane, London, W.C., are the agents for several specialities of American invention which form an everyday feature of practice in the United States. We have already referred to the Kinnear fireproof roller shutter, for which Messrs. Gibson are the agents, and, therefore, need not deal with this again. But the firm has recently introduced a new pressed radiator made by the Kinnear Co. which we now desire to describe. The feature of this radiator is that all joints and connections are machine-made, being formed by dies and machinery specially prepared for the purpose. Thus each joint is absolutely accurate and secure: each joint is also so locked and seamed together that it is impossible for it to part except under excessive pressure. After the radiator has been completely built it is immersed in a molten metal composition, which coats every particle of the radiator, not only inside but outside. This coating being applied after the construction of the radiator, it is never disturbed in any way, and consequently forms a coating which is absolutely impervious to the action of alkaline or acid waters, and, further, fills every seam or joint which may not have been tight prior to the immersion of the radiator. It is important to bear in mind that this coating is not applied until the radiator is completely built, so that there is no breakage of the coating at bending points, such as is common with galvanized iron. The application of this coating increases the thickness of the wall of the radiator to between 17 and 18 U.S. gauge. Each radiator is tested to a hydraulic pressure of 35lbs. to the sq. in. before shipment. Kinnear radiators contain $9\frac{1}{2}$ Imperial gallons of water per 100 sq. ft. of radiation. Cast-iron radiators contain $18\frac{2}{3}$ Imperial gallons per 100 sq. ft., or almost twice as much. Thus, in the Kinnear radiator, as compared with cast-iron radiators, one-half the amount of water or steam is exposed to the same radiating surface. It follows that the circulating medium of steam or water cools more rapidly and the heating units pass more rapidly into the air. From the qualities of the iron entering into the construction of the radiator and the application of the coating after its construction, its durability is unquestionable. Carbon and manganese largely enter into the manufacture of modern steel. Carbon thus used will find free air regardless of how the steel may be coated, and in finding free air it causes the metal to pit, or small pinholes to form. It is because of this particular action that modern steel is presumed to be non-durable. In Kinnear radiators carbon and manganese are absolutely negative quantities. These radiators should even exceed the durability of cast-iron radiators in which the sections are put together with steel push nipples. There is ample evidence of sheet metal being used for radiating purposes for various periods of time up to 50 years. Kinnear radiators weigh 2lbs. to the sq. ft. when boxed ready for shipment; unboxed their weight is about $1\frac{3}{4}$lbs. per sq. ft.; the weight of cast-iron radiators averages $7\frac{1}{2}$lbs. per sq. ft. In Model "K" (shown by the section given above) twice as much radiation can be obtained in the same floor space as with cast-iron. The pipe connections are made from malleable iron and are true and tight. Fig 1 illustrates a section of the Kinnear radiator, while Fig. 2 shows the section in comparison with a cast-iron section.

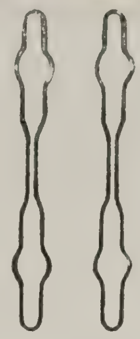


Fig. 1.
Kinnear Section.

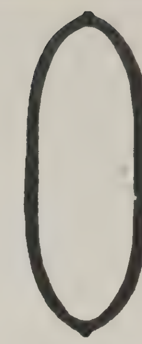
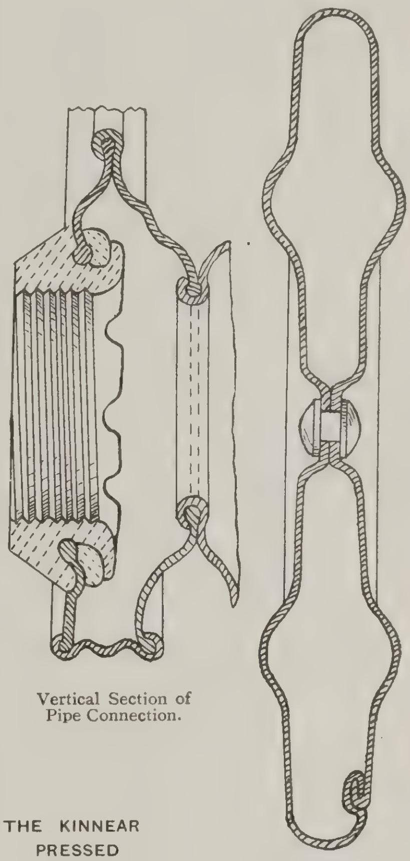


Fig. 2.
Cast-Iron Section.



Vertical Section of
Pipe Connection.

THE KINNEAR
PRESSED
RADIATOR.

Section Model "K"

BERLIN, VIENNA, ST. PETERSBURG.[*]

A Criticism.

Berlin was a very unassuming business city till after the Franco-Prussian War, for it was with the milliards extracted as war indemnity from France that the Imperial Government set about adorning its capital. The palace and the old Brandenburger Thor, at the entrance to the park, gave the cue to the city improvements commission; and the great boulevard known as Unter den Linden connects the palace with the park. A glance at this quarter of the city shows how active the authorities have been during the last thirty years; for the "Prussian Diet," the "Reichstags gebäude" or Imperial Parliament House, the Museum and Picture Galleries, and the Cathedral, are all modern; as are also the University buildings and technical schools, which, under so paternal a Government as that of the Hohenzollerns, may well be classed as official. These buildings need not detain us long. They are all externally well built and ably planned. They all lack to my mind the highest qualities of architecture. It is remarkable that the Teutonic temperament, with all its intense sentimentality, extreme earnestness and enormous vigour, fails so conspicuously in the arts. The essential coarseness of fibre in the German character permeates German art. The natural graces of the national character, the kindliness, the sympathy and the culture seem strangely enough to fail to find expression in their art, and particularly in their official art, which is somehow always imbued with the bombastic swagger of the jingling spur and the mailed fist.

The intemperate swagger of German heraldic decoration has pervaded the Denkmaeler, or monuments, with which a keen-sighted Government has adorned the city and advertised the virtues of the Imperial house it serves.

Opposite the Palace is an equestrian statue of the grand old Emperor William, backed by a colonnade and surrounded by lesser groups. The whole conception is in the grandiose spirit introduced into architecture and sculpture by Michael Angelo and elaborated under Louis XIV. It is art of the kind which supplies all the needs of the beholder—a great banquet, if you like, and you must taste it all. Nothing is suggested and nothing is veiled in mystery.

Then again, in that splendidly kept park, the Thiergarten, where, in order that the green carpet may reach to the very roots of the noble trees, different varieties of grass are carefully grown, we have an all but grotesque exhibition of imperial pride.

The Kaiser's Statues.

Leading from the most blatant of all monuments of victory, which celebrates the Franco-Prussian War, we find a noble avenue lined on one hand with a set of monuments illustrating the long line from which the Emperor springs. Now, many of these ancestors were very ordinary princelings, and some were quite nonentities, while the great Frederick and the old Emperor William were men of international scale. I suppose the fact which the designers wish to express is that all these persons were equally great, and mainly great because they were ancestors of the Kaiser. Anyhow, they all have equal honour done them in a series of designs in various styles, all of a size and all of one scheme. In the focus of a raised semicircle of white marble stands the ancestral prince, while on the dies of the balustrade behind him are found busts of his two chief advisers. The national passion for order is well evinced in this absurd scheme, for if the old Emperor William, Moltke and Bismarck make a good trio, it does not follow that the local nonentities of Prussian administrators in other periods deserve recognition at all. This is not the way to express history in art—one page to the man: it is neither good history nor good art, and the chief interest to a designer is to note the cold, scholarly ingenuity with which something of the decorative method of many centuries has been applied (I use the word "applied" advisedly) to a Greek semi-circular garden seat that focuses on the back of a Kaiser's ancestor, which appears of absorbing interest to the two henchmen behind.

Vienna's Boulevard.

Vienna is the centre of fashion for Eastern Europe, drawing to its mighty heart all the rank and style of not only the Austrian nations, but of English, German, Polish, Russian, and Balkan. This old capital city has been cleverly and nobly remodelled by wise official care. The original town is now enclosed by a car track, instead of a wall, and on each side of this main circular route we find noble spaces and parks with fine groups of public buildings. As this great boulevard wheels gradually around, we are saved the extreme regularity and monotony which characterises the great Commonwealth Avenue of Boston. Interminable boulevards are, to my way of thinking, akin to nightmares. The sense of helplessness one feels on looking both ways down a street which vanishes to the horizon may be impressive, but it is not comforting, if one has to get to one end of it in a hurry. Axial planning has become too axiomatic with the T-square designers of modern cities, and I think such a system as that of Vienna, with its noble axial groups of buildings set picturesquely about an ever-turning boulevard, should get more attention than it has yet got. Vienna is one of the most impressive capitals in the world. Nowhere has a sense of dignified luxury and pleasurable pomp been better expressed in architecture. The buildings themselves are not very striking—just the ordinary civilised European Classic; but the massing and the disposition are unexcelled.

Petersburg—A City of Brick and Plaster.

St. Petersburg, or Petersburg, as those who have lived there call it, differs from the other European capitals in this, that it was a city laid out and planned in modern times. In 1702 it was a swamp with a Swedish fort overlooking the river. The city rose at the command of Peter the Great, and the magnificent lay-out of the plan was developed under Catherine II., whom I regard as the last of the great Royal builders of Europe. Petersburg is a city of brick and plaster. The Classic Palladianism of its public buildings is only skin deep and requires continual patching and painting. The street architecture is tinted in the cheeriest colours, pink, yellow, and pale green being the favourites; but blue and chocolate are often met with. There is thus not much in the way of nobility or dignity in the architecture, and the charm of the place depends chiefly on the magnificent scale both of the buildings and the streets, and the skilful lay-out of the city as a whole. To my mind, the noblest official monument in Petersburg is the quay. On both sides of the river there are about five miles of red granite quays, the parapet consisting of great blocks, which are simply moved out of the way when a barge unloads its cargo. The famous Winter Palace is a plaster building of pronounced Rococo type, architecturally unworthy of its fame. It is painted in two shades of pink and has a certain picturesque richness when seen across the river. The most original building is the Admiralty, which is painted white and yellow, with a green roof and a gold spire, and forms three sides of a quadrangle facing the river. The bottom square has, unfortunately, been built up with residences and palaces, but the two great archways abutting on the river some 400yds. apart form splendid stops to so huge a building. The delicate spire (and spires and towers have always been the strongest line of the Russian architects) is placed at the focal point from which the three great streets of the city radiate, and gleams from miles away.

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[*] Extracts from a paper read before the Ontario Association of Architects by Professor Percy E. Nobbs, of McGill University, Montreal.

Notes on Competitions

A Competition Memory.

The publication of Mr. Pinkerton's concluding article on "Some Dublin Buildings" in *The Architectural Review* for September draws attention to a competition of a century and a quarter ago, in connection with which it would seem the services of a Competition Reform Society might have been useful. It appears that the Royal Exchange building (now the City Hall) was the outcome of a competition held in 1769. The winning design was by Thomas Cooley, an Englishman, the design placed second being that of James Gandon, the architect subsequently of the Dublin Custom House. Competitors brought to bear all the influence they could command to control the decision in this competition for the Royal Exchange building. Gandon had the powerful backing of the Beresford family, and used it; on the other hand his design was badly slated by an anonymous pamphleteer. In the end, however, the Dublin merchants remained unmoved, and the work was given to Cooley, which was satisfactory from the standpoint of competition ethics. Cooley was also the architect of the Dublin Courts of Law—the Four Courts—but only a commencement with this building had been made at the time of his death; the work was completed by Gandon, who is usually credited with being the sole architect. Gandon, it may be mentioned, won the first prize in the competition for Bethlehem Hospital, London, though the carrying out of the work was given to another architect; thereupon Gandon made use of his powerful friends, and one of them, Lord Carlow, invited him to make plans for a new custom house, docks, &c., in Dublin. The scheme was kept as quiet as possible owing to strong opposition from the City authorities and the people of Dublin to the Government's acquisition of the site. When everything was supposed to have been arranged, Gandon went over to Ireland to start the work, but found that for some time he had to remain practically in hiding, and not go near the site for fear his presence in Dublin should be known. When at length a start was made, the site enclosed, and excavation began, the Corporation made a demonstration, and pulled down some walling. The mob also broke loose, and Gandon, who feared his trenches, was relieved to find the mob amusing itself by swimming in them! After this he was left in peace.

Once, and Once Only.

In the issue of the "American Architect" for August 18th, which has just reached us, we notice a paragraph about a little competition for public drinking-fountains to be erected in New York City, by the American Society for the Prevention of Cruelty to Animals, which is of interest. The Society has been given £100 by a friend of animals, and offers £80 of it as a prize for the best design, intending to pay the remaining £20 for the full-size drawings and for supervision. Notice is given, however, that on making such payment the Society "shall have the right to procure and set up as many replicas or reproductions of the design as they may at any or all times desire, without further compensation to the said winner." Here is clear and honourable notice given of an intended duplication of product after a single design, and opportunity is given anyone to abstain from competing on the ground that, while £80 might satisfactorily enough pay for one fountain, it did not as satisfactorily pay for 5,000. But of even more value is the significant implication that it would be dishonourable to duplicate a product from an architect's design without the designer being notified originally that such was the promoter's intention.

East Wemyss School.

In the competition for alterations and additions to the school at East Wemyss, for the School Board, the design of Mr. George C. Campbell, of the Estate Office, Wemyss, has been selected and adopted.

List of Competitions Open.

DATE OF DELIVERY	COMPETITION.
Aug. 31	HIGH SCHOOL FOR GIRLS AT BARNSLEY. Applications by this date to W. P. Donald, clerk to the Governors, Education Office, Barnsley. Premiums of £100, £50 and £20.
Sept. 3	NEW SECONDARY SCHOOL AT MEXBOROUGH, ROTHERHAM. Limited to architects practising within 35 miles of Mexborough. Particulars from J. W. Hattersley, Secretary to Governors of School, Mexborough.
Sept. 6	LABOURER'S COTTAGE AT GALWAY to cost £80. Premium £5. Particulars from J. Redington, secretary, Urban District Council, Galway. (See advt. on p. xxiii. of this issue.)
Sept. 11	COTTAGE HOMES AT CLEADON and receiving house at workhouse, for Guardians of South Shields Union. Particulars from J. W. Coulson, Union Offices, South Shields.
Sept. 20	SCHOOL AT SUNDERLAND. Limited to local architects. Premiums of £50, £20 and £10. Particulars from John W. Moncur, Borough Engineer, Town Hall, Sunderland.
Sept. 21	CONVALESCENT & NURSES' HOME AT GLOSSOP. Premiums of £20 & £10. Particulars from Mr. T. W. Ellison, Town Clerk, Norfolk Chambers, Glossop.
Sept. 28	SEWAGE DISPOSAL SCHEME FOR ELLESMERE. Premium of £20. Particulars from R. E. Lloyd, clerk to Urban District Council, Ellesmere.
Sept. 29	REBUILDING OF HENSHAW'S BLIND ASYLUM AT MANCHESTER. Limited to Manchester architects. Premiums £100, £50 and £25. Assessor, Mr. John Holden, F.R.I.B.A.
Oct. 1	ALPHABET COMPETITION. Prizes of £20, £10 and £5. For particulars see "Architectural Review."
Oct. 31	BOURSE AT CAIRO.—Premiums of £E250 and £E100. International competition. Designs to be submitted to the "Corporation des Agents de Change," Cairo, Egypt.
Dec. 14	FOUNDLING HOSPITAL, MONTEVIDEO.—Four selected designs in preliminary competition to be awarded £212 each; first premium of £742 in final competition. • Particulars from Consulate-General for Uruguay, 5 & 6, Clement's Inn, London, W.C.

AMERICAN SPECIFICATIONS FOR STONE.

The changes that have been brought about in the writing of specifications in the United States by the development of building methods can scarcely be realised except by an architect or building contractor of very long experience, says Mr. Francis W. Hoyt, in the "American Architect."

One branch of specification writing, however, has shown little improvement, namely, that which relates to stonework and the choice of stone.

During the past quarter of a century decided progress has been made in the study of economic geology. When the science was first taken up as a proper subject for Governmental and State investigation, the geologists devoted all of their time to paleontology, and the establishment of the co-relation of the different geological horizons. These abstruse branches still claim most of their attention, but a few have given extended investigation to economical features. The first real work in this line was done, not in America, but in England. The Royal Commission appointed, about the middle of the last century, to make a choice of a suitable stone for the new Houses of Parliament, went to work most carefully, but in a crude way. Unhappily their selection of the Yorkshire magnesian limestone has disappointed all expectations, for the stone has disintegrated sadly and has proved nothing like as durable as the famous Portland oölite. The work of the commission, however, no matter what its outcome, was a move in the right direction.

British architects, Mr. Hoyt observes, are usually much more precise than their American brethren in stone specifications. "Most stones vary more or less in the different strata or beds, and in England each bed is named. For particular work the English architect specifies, not only the variety, but also the exact bed from which the stone he desires must be drawn. We have not yet reached this degree of particularity, but it would add to the uniformity and durability of our stonework if architects would make a greater effort to familiarise themselves with what has already been accomplished in economic geology. The trouble is that the subject is nowhere taught, and that the literature is widely scattered in dry State and Governmental reports. The one popular work on the subject is *Stones for Building and Decoration*, by Prof. George P. Merrill, of the National Museum."

The points which it is important to consider, if one would write stone specifications that will leave no loopholes for dishonesty or slackness, are the mineral and chemical composition of a stone, strength and durability, effect of weathering, porosity, texture and crystallisation, mode of occurrence (whether massive or stratified), freedom from impurities, and method of quarrying. There have been so many serious delays in the furnishing of stone for important buildings that it is getting to be the custom for architects and building-committees to inspect competing quarries before large contracts are given out. The man who writes the specifications should also have the benefit of extensive quarry observations, if he is to do his best. A study of the weathering of stone can be made with far better effect as it lies in its natural bed than after it has been placed in a building.

In the Tenth Census is given the following table of the "life" of the various kinds of American building stones, by the term "life" being understood the number of years that the stones have been found to last without discoloration or disintegration to the extent of necessitating repairs:

	Life in Years.
Coarse Brownstone … … … … … …	5 to 15
Fine laminated Brownstone … … … …	20 to 50
Compact Brownstone … … … … … …	100 to 200
Coarse fossiliferous Limestone … … …	20 to 40
Fine oölitic (French) Limestone … … …	30 to 40
Marble, coarse, Dolomitic … … … … …	40
Marble, fine, Dolomitic … … … … …	60 to 80
Marble, fine … … … … … … … …	50 to 100
Granite … … … … … … … … …	75 to 200
Gneiss, fifty years to many centuries … …	——

The above table is only a rough help to the specification-writer. Each stone must be studied by itself without regard to its class. There are granites that have begun the process of disintegration before ever they are quarried, and their term of life is short. There are also compact brownstones in which the cementing material has lost its cohesive qualities, so that the grains of silica and quartz crumble apart like loaf sugar. There are, on the contrary, coarse brownstones, like Runcorn, that absorb water like a sponge, and yet have excellent durability.

Continuing, Mr. Hoyt says:—"A great deal of stress is laid on the strength of stone. When crushing tests show a high result, the producer of the stone makes a leading argument of the fact in favour of his material. For ordinary building purposes it makes no practical difference whether a stone can withstand a crushing test of 3 to 4 thousand, or 30 to 40 thousand, lbs. per sq. in. A variation of thousands of pounds in crushing strength can be shown by stones from the same quarry, merely by the skill with which the cubes are prepared for testing."

Special care should be observed, of course, in the preparation of specifications for additions to existing buildings unless contrast is sought. It is not enough to call for stone of the same general class and appearance. Chemical analysis, texture and strength must all be taken into account. An instance showing the danger of using two different stones in the same building is furnished by the State Capitol of Washington. Use was made of two sandstones from different localities, that appeared almost identical at first, but under the influence of weathering they grew very dissimilar. An effort was made to bring the inferior stone back to its original appearance by the use of acid washes, but it was an unfortunate expedient, for the treatment only made the defects worse.

As another example illustrating the necessity for taking the greatest care in specifying stone, we may turn to one of the most conspicuous and important public edifices in New York built of the most coarsely crystalline of the carbonate of lime marbles. Some years after it was erected it was desired to build an addition. The choice fell on a very fine-grained dolomite. The former stone is noted for its non-absorbent qualities. A drop of red ink can be allowed to stand on its surface for hours, and when washed off leaves scarcely a trace. The dolomite absorbs the ink as a lump of sugar takes up coffee from a saucer. It needs no scientist to predict what a lack of harmony there will be between the original building and the addition in a few years' time. If the specifications had been carefully drawn so as to require an accord between the stones of the two parts, the choice of this particular dolomite would have been impossible.

Complete List of Contracts Open.

WITH a few exceptions, news of Contracts Open are not repeated after they have been published once in these columns, so that readers will find particulars in our previous issues of other contracts that still remain open.

Unless expressly stated to the contrary, all deposits required for bills of quantities, &c., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair-wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

August 30. Cookstown, Co. Tyrone.—*Erection and completion of a new Catholic Church at Lissan, Cookstown*, Co. Tyrone, for the Very Rev. B. O'Connor, P.P., according to the plans and specification, prepared by Ashlin & Coleman, architects, 7 Dawson Street, Dublin. Bills of quantities have been prepared by D. W. Morris, surveyor, 68, Harcourt Street, Dublin, and can be obtained from him on payment of £1 1s. The plans and specification can be inspected at the Architect's offices, and at the Presbytery, Lissan. Sealed tenders, addressed to the architects, to be delivered at the architects' offices not later than 12 o'clock noon on August 30.

Sept. 1. Penzance.—*Construction of a new warehouse floor* 18ft. by 36ft. Plan and specification can be seen at the office of the Clerk of Works, Trengwainton, Hea-Moor, Penzance. Tenders to be returned not later than Sept. 1, to W. W. Webber, clerk of works.

Sept. 1. Rhosneigr, Anglesey.—*Construction and completion of house, shop and bakehouse* at Rhosneigr. Plans and specifications may be seen of Evans & Co., Chester House, London Road, Holyhead, where the contractor must take his own quantities. Tenders to be in by Sept. 1,

Sept. 1. Dartmouth.—*Erection and completion of new shipping offices* on the South Embankment, Dartmouth, for Renwick, Wilton & Co. Drawings conditions, and specifications may be seen, and forms of tender, together with copies of bills of quantities, obtained, on application, at the offices of P. M. Luke, civil engineer, 15 Princess Square, Plymouth, and upon payment of a deposit of £2 2s. Sealed tenders, accompanied by fully-priced quantities, and endorsed "Tender for Shipping Offices," must reach Mr. Luke on or before Sept. 1.

Sept. 3. Canterbury.—*Alteration at the Municipal Offices in Guildhall Street.* Particulars of the work may be obtained at the offices of A. C. Turley, Assoc.M.Inst.C.E., city surveyor, City Surveyor's Office, Canterbury. Sealed tenders for the work must be forwarded to the Town Clerk, Burgate Street, by 5 p.m. on Sept. 3.

Sept. 3. Fife. — *Erection of joint infectious diseases hospital* near St. Michael's, Leuchars, Fife. Applications for schedules must be lodged with W. Carruthers Laidlaw, architect, 4, York Buildings, Edinburgh, from whom schedules can be obtained on payment of a deposit of £1. All tenders must be lodged with the architect not later than Sept. 3.

Sept. 3. Dartmouth.—*Demolition and rebuilding of the Globe Inn*, Smith Street, Dartmouth, for J. Bartlett & Co. Persons desirous of submitting an estimate are requested to send their names to R. M. Luke, civil engineer, 15, Princess Square, Plymouth, where drawings, conditions, and specifications may be seen, and further information obtained. Sealed tenders, endorsed "Tender for Globe Inn," must be delivered to him not later than Sept. 3.

Sept 3. Stourton.—*Providing and erecting a wood and iron fencing* round the new sewage disposal works at Stourton, for the Rothwell Urban District Council. Plans and specfication can be seen and particulars obtained at theoffices of E. J. Silcock, M.I.C.E., engineer, 10 Park Row, Leeds. Sealed tenders, endorsed "Stourton Fencing" must be delivered to W. Dodgson, clerk to the Council, Council Offices, Rothwell, near Leeds, not later than noon Sept 3.

Sept. 3. Tettenhall.—*Pulling down and re-erection of a brick wall* (about 50 square yards), situate at the Barnhurst Sewage Farm, Tettenhall, near Wolverhampton. Plans may be seen, and specification and form of tender obtained, on application at the Office of G. Green, borough engineer, Town Hall. Wolverhampton. Tenders addressed to the Chairman of the Sewerage Committee, to be delivered at the Town Clerk's Office by 10 a.m. on Sept. 3. Fair wages clause.

Sept. 3. Castleblayney.—*Erection of a goods store (90ft.×25ft.) and office (20ft.×14ft.)* of timber, with galvanised corrugated iron roof, &c., at their Castleblaney Station, for the Directors of the Great Northern Ry. Co. (Ireland). Parties wishing to tender may see the drawing and specification at the office of W. H. Mills, Engineer-in-Chief, Amiens Street Terminus, Dublin, or copies of them at the office of the District Engineer, Belfast, and forms of tender can be obtained at either of the said offices on payment of 1s. each. Tenders made out on the forms supplied by the Company, and endorsed "Tender for Goods Store," should be delivered to T. Morrison (Secretary), Secretary's Office, Amiens Street Terminus, Dublin, not later than 10 a.m. on Sept. 3.

Sept. 3. Ballycastle.—*Erection of the following cottages*, for the Rural District Council, upon the several sites shown on the deposited plans in the following townlands:—Double cottage in the townland of Maghernahar; double cottage in the townland of Toberkeagh; double cottage in the townland of Ballycleagh; double cottage in the townland of Moycraig Lower; double cottage in the townland of Ballypatrick; double cottage in the townland of East Torr; double cottage in the townland of Eglish; block of three cottages in the townland of Coolkenny; block of four cottages in the townland of Capecastle; block of four cottages in the townland of Coolnagoppoge; block of four cottages in the townland of Townparks; block of six cottages in the townland of Drumawillin. The contractor can be put into possession of the sites immediately after the execution of the contract. The deposited maps and the plans, specifications, and draft contract may be inspected in the office of H. M'Gill, clerk of the Ballycastle Rural District Council, Boardroom, Ballycastle, from 10 a.m. to 4 p.m. each day by intending contractors. Tenders must be upon the prescribed form (which can be obtained at the above office) and in strict conformity with the specification, and must be sealed and addresed to the presiding chairman, Ballycastle Rural District Council, and marked "Tender for Cottages," and must be received by H. M'Gill not later than 3 p.m. on September 3. The names and addresses of two solvent sureties must accompany each tender. Separate tenders must be sent in for the erection of each block of cottages.

Sept. 4. Ballinderry.—*Alteration and additions to Oatlands, Ballinderry*, according to the plans, specification, and conditions of contract, to be seen of W. J. Fennell, architect, 2, Wellington Place, Belfast. Tenders to be sent to the architect before 12 o'clock on September 4. Bills of quantities can be had from M'Carthy & Brookes, surveyors, Scottish Provident Buildings.

Sept. 4. Birmingham.—*Erection of new stables, cattle pens, &c.*, at Small Heath, Birmingham, for the Great Western Eailway. Plans and specifications may be seen and forms of tender and bills of quantities obtained at the office of the Resident Engineer at Acocks Green Station, between the hours of 10 a.m. and 4 p.m. Tenders, addressed to G. K. Mills, secretary, Paddington Station, London, and marked outside "Tender for Stables, &c., Small Heath," will be received on or before Sept. 4.

Sept. 4. Tyseley, near Birmingham.—*Erection of a new engine-shed, &c.*, at Tyseley, near Birmingham, for the directors of the Great Western Railway Co. Plans and specifications may be seen and forms of tender and bills of quantities obtained at the office of the Resident Engineer at Acocks Green Station, between the hours of 10 a.m. and 4 p.m. Tenders addressed to G. K. Mills, secretary, Paddington Station, London, and marked outside "Tender for Tyseley Engine-Shed," will be received on or before Sept. 4.

Sept. 4. Lochmaben.—*Erection of the Lochmaben Combination Hospital* for the Board of Directors. Plans may be seen with, and schedules obtained from F. Carruthers, Esq., architect, 35, Buccleuch Street, Dumfries, on payment of £1 1s. Mr. Carruthers will meet intending contractors at the Town Hall, Lochmaben, on August 28, between the hours of 11 a.m. and 3 p.m.; and all tenders must be lodged with John Ford Cormack, solicitor, Lockerbie, clerk to the Combination, on or before Sept. 4.

Sept. 4. London, W.—*Execution of ordinary works and repairs to buildings, &c.*, in the charge of the Commissioners of His Majesty's Works and Public Buildings in the London district for three and a half years from October 1, 1906. The printed schedule, with form of tender, may be obtained at His Majesty's Office of Works, Storey's Gate, Westminster, between the hours of 11 a.m. and 5 p.m., upon payment of £1. Tenders must be delivered before 12 o'clock noon on Sept. 4, addressed to the Secretary, H.M. Office of Works, Storey's Gate, London, S.W., and endorsed "Tender for Ordinary Works and Repairs, London."

Sept. 4. Blackrock.—*Works in connection with the New Assembly Room, Town Hall, Blackrock*, for the Urban District Council. (a) Overhauling and repairing roof, (b) erection of gas fittings, (c) extension and repair of present ceiling, (d) relaying of present floor, (e) decorating and painting walls, &c. Tenders for each of the several works to be on separate forms. Specifications can be seen and full particulars obtained at the Surveyor's office, Town Hall, Blackrock. Materials must be, as far as possible, of Irish manufacture. Fair wages clause. Tenders (which are to be on prescribed forms) must be lodged with R. F. Heron, town clerk, Town Hall, Blackrock, Co. Dublin, on or before four o'clock p.m. on Sept. 4.

Sept. 4. Maidstone.—*New Police Station on land adjoining Mill Street.* Applications for bills of quantities and form of tender to be made at the offices of Ruck and Smith, architects, 86, Week Street, Maidstone, where plans and specification may be seen on or before August 27, after which date no application can be entertained. A copy of the quantities and form of tender will be supplied to those who have made application, in exchange for £2 2s. Sealed tenders, which will only be received on the form supplied, to be sent to S. L. Monckton, Town Clerk's Office, King Street, Maidstone, endorsed "Tender for new Police Station," on or before noon on September 4. Should any tender be accepted, it will be on condition that the sanction of the Local Government Board is given to the necessary loan for cayrying out the scheme.

Sept. 5. Manchester. — *Erection of the Domett Street Municipal School, Blackley, Manchester.* Plans may be seen and a copy of the bills of quantities (including specification) may be obtained at the Education Offices, Deansgate, Manchester, on a deposit of £2 2s. Tenders, on the official forms, and enclosed in the envelopes provided, must be delivered not later than September 5. Cheques to be made payable to the Accountant, Education Offices, Deansgate, Manchester.

Sept. 5. Manchester.—*Alterations and additions to the Abbott Street Municipal School, Rochdale Road, Manchester.* Plans may be seen and a copy of the bill of quantities (including specification) may be obtained at the Education Offices, Deansgate, Manchester, on a deposit of £2 2s. Tenders, on the official forms and enclosed in the envelopes provided, must be delivered not later than Sept. 5. Cheques to be made payable to the Accountant, Education Offices, Deansgate, Manchester.

Sept. 5. Brentwood, Essex.—*Fitting-up spray baths, &c., at High Wood School*, Brentwood, Essex, in accordance with drawing, specification, and conditions of contract prepared by W. T. Hatch, M.Inst.C.E., M.I.Mech.E., engineer-in-chiet. Drawing, specification, conditions of contract, and form of tender may be inspected at the office of the Board, Embankment, London, E.C., and can then be obtained upon payment of a deposit of £1. Tenders, addressed as noted on the form, must be delivered at the office of the Board not later than 10 a.m. on Sept. 5.

Sept. 7. Hazel Grove, near Stockport.—*Erection of stables and coachhouse, &c.*, at the Stepping Hill Hospital, Hazel Grove, near Stockport, in accordance with plans and specification prepared by W. H. Ward, architect, Paradise Street, Birmingham. Plans and specification may be seen of C. F. Johnson, clerk to the Guardians, Union Offices, Stockport, or upon application to Mr. Ward, during the usual office hours. Forms of tender, with copies of bills of quantities, will be sent to contractors upon application, enclosing cheque for £2 2s. Sealed tenders are to be sent to C. F. Johnson, not later than 10 a.m. on September 7. Fair wages clause.

Sept. 8. Kea.—*Erection of a stable at Calenick Farm*, in the parish of Kea, in the occupation of the executors of T. Thomas. Plans, conditions, and specifications can be seen at the farm house at Calenick. Tenders should be sent on or before Sept. 8 to G. Gow, Tregothnan Office, Truro.

Sept. 8. Derby.—*Erection of a new school* on a site between Clarence and Porter Roads. Plans, specfications, and conditions of contract may be seen and schedules of quantities may be obtained, on application to Hunter and Woodhouse, All Saints' Chambers, Iron Gate, Derby. The sum of £1 1s. will be charged for the schedule of quantities. Tenders on the form supplied, together with the priced schedule of quantities, must be delivered at the Education Office, Becket Street, Derby, before 12 o'clock at noon on Sept 8, endorsed "Tender for New School on Clarence Road." Fair wages clauses. Tenders will be accepted from Derby firms only.

Sept. 10. Bury St. Edmund's.—*Alterations and additions to the County School*, Northgate Street, Bury St. Edmund's, for the West Suffolk Education Committee. Plans and specifications can be seen at the Education Offices, 5, Crown Street, Bury St. Edmund's, or at the Offices of the County Architect, A. Ainsworth Hunt, Sudbury and Bury St. Edmund's. Tenders, sealed and endorsed, to be delivered to F. R. Hughes, secretary to the Education Committee, 5, Crown Street, Bury St. Edmund's, on or before Sept. 10.

Sept. 10. Salford.—*Extensions to car depot and workshops* for the Tramways Committee. Contract 145, constructional steelwork; contract 146, builders' work, in their erection and completion of extensions to the Central Car Depot, Frederick Road, Pendleton. Forms of tender and bills of quantities for either contract may be obtained on application to the General Manager, Tramways Department, 32, Blackfriars Street, Salford, upon depositing a cheque for £2 2s. Plans can be inspected and further particulars obtained at the above-mentioned offices. Tenders endorsed "Steelwork" (or "Buiders' Work" as the case may be) "Car Depot Extensions," and addressed to the Chairman, Tramways Committee, Town Hall, Salford, must be delivered to L. C. Evans, town clerk, Town Hall, Salford, not later than 3 p.m. on Sept. 10.

Sept. 11. Manchester.—*Execution of Alterations at the Benton Technical Institute* for the Lancs. Education Committee. The plans may be seen and bills of quantities obtained at the offices of J. W. Beaumont & Son, 10, St. James's Square, Manchester. Tenders must be delivered before 12 o'clock noon on Sept. 11, sealed and endorsed, to W. F. Knott. Parish Offices, Ashton-under-Lyne.

Sept. 11. Audenshaw. — *Erection of a new public elementary school* at Audenshaw. The plans may be seen and bills of quantities obtained at the office of Henry Littler, county architect, 16, Ribblesdale Place, Preston, by payment of a deposit of £2. Tenders must be delivered before 12 o'clock noon on September 11, sealed and endorsed, to W. F. Knott, Parish Offices, Ashton-under-Lyne.

Sept. 12. Merthyr Tydfil.—*Additions and improvements* to Bethesda Congregational Chapel, Merthyr Tydfil. The plans and specifications can be seen with Mr. Rees Jones, grocer, Bethesda Street. The tenders to be sent, sealed and endorsed, to J. Thomas, 90, Brecon Road, Merthyr Tydfil, not later than Sept. 12.

Sept. 13. Chartham Hatch.—*Alteration and enlargement, to accommodate 40 additional children of the Council School at Chartham Hatch*, near Canterbury, Kent. Drawings and specifications may be inspected at the office of W. J. Jennings, architect, 4, St. Margaret's Street, Canterbury. Any person desiring to tender and to receive copy of bills of quantities must send his name to the architect, together with a deposit of £1, not later than noon on September 4. Tenders on the form supplied to be delivered to F. S. Cloke, Sandwich, Kent, not later than noon on September 13.

Sept. 14. Harthill-with-Woodall, West Riding.—*Erection of a new cloakroom at Harthill-with-Woodall* Provided School for the West Riding County Council. Plans may be seen and quantities obtained on application to J. Vickers Edwards, county architect, County Hall, Wakefield. A deposit of £1 is required, which will be returned on receipt of a *bona fide* tender. Cheques to be sent to the West Riding Treasurer, County Hall, Wakefield. Sealed tenders, properly endorsed, to be sent to the County Architect, not later than 10.30 on the morning of Sept. 14.

Sept. 14. Wakefield, West Riding.—*Different works in connection with the following schools:*—Thornton-in-Craven new School, Elslack new School, Cudworth new School, Kirkhamgate new School, Bolton-on-Dearne (Goldthorpe, Infants), Provided School (enlargement), Mytholmroyd (Scout Road Provided School, sanitary alterations), Mytholmroyd (Burnley Road Provided School, sanitary alterations), Mytholmroyd (Cragg Vale Provided School, sanitary alterations—builder and plumber), Harthill-with-Woodhall Provided School (alterations and new cloakroom—builder, &c.), Adwick-on-Dearne Provided School (alterations and repairs—builder and asphalter), for the West Riding C.C. Education Committee. Plans may be seen and quantities obtained on application to J. Vickers Edwards, county architect, County Hall, Wakefield. A deposit of £1 is required for each of the above schools. Cheques to be sent to the West Riding Treasurer, County Hall, Wakefield. Sealed tenders, properly endorsed, to be sent to the County Architect not later than 10.30 on the morning of Sept. 14.

Sept. 15. Hounslow.—*Erection of a new infants school at Spring Grove*, to accommodate 350 children, for the Heston and Isleworth U.D Education Committee. The plans may be inspected at the office of A. Lang, architect, Council House, Hounslow, where also bills of quantities may be obtained, together with specification and form of tender, on payment of a deposit of £2 2s. Tenders on the forms supplied, to be delivered to H. J. Baker, clerk to the committee, Council House, Hounslow, not later than 12 noon on September 15, endorsed "Tender for Spring Grove Infants School."

Sept. 17. Gainsborough.—*Pulling down and rebuilding premises in Bridge Street*, Gainsborough, belonging to the Gainsborough Industrial Co-operative Society, Ltd. Bills of quantities and form of tender may be had on application to Scorn and Gamble, architects, Bank Street Chambers, Lincoln, on or before September 5 and on payment of £2 2s. The drawings and conditions of contract may be inspected at the offices of the architects. Tenders must be delivered to the manager at the office of the Society, 11, Bridge Street, Gainsborough, and in the envelope provided for the purpose, before 10 a.m. on September 17.

Sept. 18. London, S.E.—*Erecting a public convenience and bath houses* at Bell Green, Lower Sydenham. Drawings, specification, and form of contract can be seen, and a copy of the drawings, specification, and form of tender may be obtained at the Town Hall, Catford (Surveyor's Department), on payment of a deposit of £5. The tenders must be on forms issued by the Council, enclosed in an envelope, sealed and endorsed "Tender for Convenience and Bath Houses," and must be delivered by 4 o'clock on Sept. 18 at the Town Hall, and placed in the box there provided for the purpose. The work must be proceeded with immediately on obtaining the Borough Surveyor's order to commence the work, and the contractor must employ local labour as far as practicable in carrying out the work. Fair wages clause.

Sept. 27. London, E. — *Additions and alterations in the building at the Electricity Works*, Osborn Street, Whitechapel, E. Persons tendering must submit the names and addresses of two substantial persons willing to be jointly and severally bound for the due and proper performance of the contract. Fair wages clause. The drawings may be seen and copies of the stipulations, specification, schedule, and form of tender may be obtained by applying to M. W Jameson, A.M.Inst.C.E., borough engineer, 15, Great Alie Street, Whitechapel, E., between the hours of 10 a.m. and 12 noon, upon paying £5. Tenders, endorsed "Tenders for Additions to Electricity Buildings," should be sent to G. W. Clarke, town clerk, 15, Great Alie Street, Whitechapel. E., in the envelopes supplied, so as arrive at this office on before 12 o'clock noon on Sept. 27.

No date. Pannal.—*Erection and completion of a new house*, Hill Foot, Pannal, for A. Rushworth, Esq. Contractors are requested to send in their names to R. Crosland, architect, 10, James Street, Harrogate, and quantities will be forwarded when ready.

No date. Bristol.—*New warehouses upon the Bath Road*, Bristol. Quantities can be obtained and plans and specifications inspected upon application to J. Harding & Son, architects and surveyors, Salisbury.

No date. Swadlincote. — *Erection of a free library at Swadlincote* for the U.D.C. Plans and specifications may be seen, and quantities and particulars obtained, at the office of A. Macpherson, Esq., architect, 16 Tennant Street, Derby, on payment of deposit of £2 2s.

No date. Chesterfield.—*Erection and completion of four new cottages and two shops*, Durrant Road, Chesterfield. Contractors can see plans, and obtain bills of quantities and all further information at the offices of W. C. Jackson, M.S.A., architect and surveyor, 29, Knifesmith Gate, Chesterfield.

ENGINEERING.

August 31. Margam.—*Construction of an iron girder bridge with stone abutments and approaches*, for the U.D. of Margam. Plans and specification may be seen by appointment with J. Cox, surveyor to the Council, Port Talbot, on payment of a deposit of £1 1s. Tenders to be delivered to D. E. Jones, solicitor, clerk to the Council, Port Talbot, not later than August 31, sealed and endorsed, "Tender for Hoel-y-Glo Bridges."

Sept. 1. Christiania (Norway).—*Supply and erection of about 42 tons of iron framework bridges.* Tenders (through agent residing in Norway) to be sent to Veidirektorens Kontor, Akers Gade 42 IV., Christiania, not later than Sept. 1.

Sept. 1. Glasgow.—*(1) The mason work and (2) the steel-work required in connection with the widening of Keppochhill Road Bridge over the North British Railway.* Specifications and forms of tender may be had on application at the Office of Public Works, City Chamber, 64, Cochrane Street. Sealed tenders, marked outside "Tender for Mason Work, Keppochhill Road Bridge." must be lodged with A. W. Myles, town clerk, City Chambers, Glasgow, on or before Sept. 1.

Sept. 1. Glasgow.—*Supply, delivery, and erection, under one contract of the whole of the machinery and accessories required for the mechanical equipment of the machinery buildings* at Shieldhall out-fall works. Specifications and forms of tender may be had on application at the office of Public Works, City Chambers, 64, Cockrane Street, Glasgow, by depositing the sum of £10 10s. Plans and drawings may be seen and further particulars obtained at the office of W. D. Hamilton, consulting engineer, 59, Bath Street, Glasgow. Tenders, marked outside "Tender for Sewage Disposal Machinery, Shieldhall," must be lodged with A. W. Myles, town clerk, City Chambers, Glasgow, on or before Sept. 1.

Sept. 3. Margate.—*Installation of a system of electric light at the Wingham Pumping Station*, about six miles from Canterbury and a mile and a half from Adisham Railway Station. Forms of tender and specification and any further particulars may be obtained from Mr. J. A. Forde, engineer, 15, Victoria Avenue. Northdown, Margate, on a deposit of £1 1s. being made. Sealed tenders, endorsed "Electric Lighting," are to be sent in to E. Brooke, town clerk, Town Clerk's Office, Margate, not later than one o'clock p.m. on Sept. 3.

Sept. 4. Lancaster. — *Proposed re-construction of steam heating arrangements* and hot water service at County Lunatic Asylum, Lancaster. Tenders to be sent by Sept. 4 (extended date) to J. T. Cheetham, clerk and steward.

Sept. 4. Wiveliscombe.—*Boring a trial artesian well* for the Wiveliscombe District Council within their district. Specifications of the work can be seen at the office of T. V. Pearse clerk to the Wiveliscombe District Council, on any week day (except Saturdays) between the hours of 10 and 5, and to whom tenders should be sent on or before Sept. 4, marked "Tender for Trial Boring."

Sept. 6. Downpatrick.—*Well Boring tenders required* by the Down District Lunatic Asylum immediately for boring a 4-inch diameter hole in a well in the Asylum grounds. Quotations in accordance with specification, which may be seen at the Asylum, to be lodged with the resident Medical Superintendent on or before Sept. 6, at 12 o'clock noon. Sinking has already been executed to the depth of about 56 feet.

Sept. 7. Tadcaster.—*Boring and testing the quantity and quality of water obtainable at the Kiddall Quarry*, situated on the Leeds and Tadcaster Road, about 2 miles from Scholes Station, for the R.D.C. Further particulars can be obtained on application to G. A. Bromet, clerk to the Council, Tadcaster. Sealed tenders, marked "Kiddall Water," to reach his office not later than Sept. 7.

Sept. 8. Kettering.—*Construction of waterworks for the parish of Burton Latimer* as set forth in the following contracts for the Kettering R D.C.:—Contract No. 1—Service reservoir and laying mains: The construction of a service reservoir to hold about 119,000 gallons, the laying and jointing of about 6¼ miles of cast-iron pipes, from 8ins. to 3ins. diameter, the fixing of valves and fittings, and alterations to the present pumping station. Contract No. 2—Cast-iron pipes: The supply and delivery of about 560 tons of cast-iron pipes and specials, varying in diameter from 8ins. to 3ins. Contract No. 3—Valves: The supply and delivery of about 37 sluice valves, from 8ins. to 3ins. diameter, 20 air valves, 2 relief valves, 51 screw-down hydrants, together with surface boxes, name plates, and posts. Contract No. 4—Gas-engines, suction gas plant and pumps: The supply and erection of two 17-b.h.p. gas-engines, two suction gas plants, and two sets of three-throw pumps, together with all gearing, pipes, valves, tools, and plant in connection therewith. The drawings may be seen at the offices of Everard, Son, and Pick, engineers, 6, Millstone Lane, Leicester, from whom conditions, specification, quantities, and form of tender may be obtained upon payment of £2 2s. for each contract. Sealed tenders, upon the form supplied, to be sent to the Engineers, 6, Millstone Lane, Leicester, not later than 10 o'clock in the forenoon of Sept. 8.

Sept. 11. Madrid (Spain).—*Extension of the Lage quay and the provision of accommodation for travellers* at the port of Vigo. Estimated cost, £7,964. Local representation is necessary. Specifications and particulars may be obtained from the Directorate General of Public Works, Madrid. Tenders must be sent in by Sept. 11.

Sept. 17. Sofia (Bulgaria).—*Construction of the Devna-Dobritch railway*, length 76½ kilometres. Deposit, 275,000 frs. Specifications and particulars can be obtained at the offices of Minister of Public Works, Sofia. Tenders should be sent in not later than Sept. 17.

Sept. 17. Oxford.—*Reconstruction, extension, and electrical equipment of the existing horse tramways* in the City of Oxford and the leasing thereof. Proposals based upon the overhead system of electric tramways will not be considered. The conditions of tender may be obtained from R. Bacon town clerk, Town Hall, Oxford, on deposit of Bank of England notes to the value of £100. Tenders must be addressed to the Town Clerk, in sealed packets, endorsed "Tender of Tramways," and delivered at his office in the Town Hall, Oxford, on or before Sept. 17.

Sept. 25. Beregszasz (Hungary).—*Erection and installation of electrical works for lighting the town and for industrial purposes:* deposit 10,000 kronen. Specifications and particulars may be obtained from Der Burgermeister der Stadt, Beregszasz. Tenders must be sent in not later than Sept. 25.

Sept. 28. Pewsey.—*Sinking of a well, 10-ft. internal diameter and 90-ft. deep, and for sinking from the bottom of such well a bore hole 12-in. internal diameter and a further 11-ft. deep*, together with other work in connection therewith at Pewsey for the R.D.C. The drawing and specification for the above may be seen of S. B. Dixon, clerk to the Pewsey R.D.C. Pewsey, from 10 a.m. to 5 p.m. each day except Saturdays. Copies of specification and form of tender and schedule may be obtained from Fairbank and Son, C.E., engineers, Lendal Chambers, York, on payment of £3 3s. Sealed tenders, endorsed "Tender for Well and Bore Hole, Contract A," must reach S. B. Dixon on or before 10 a.m. on Sept. 28 next.

No date. Swansea.—*5 pairs of main sluices and 10 pairs of supplementary stop paddles, together with hydraulic and hand power machinery for working them*, for the Swansea Harbour Trust. Drawings may be inspected between 11 a.m. and 4 p.m. at the Office of the Trustee's Engineer, A. O. Schenck, M.Inst.C.E., Harbour Offices, Swansea, and copies of the drawings, specification, conditions, and forms of, and instructions for, tender may be obtained of T. Strick, clerk, Harbour Offices, Swansea, on payment of £5 5s.

No date. Altrincham.—*Widening of the Broadheath Bridge* for the U.D.C. Copies of quantities may be obtained from Maxwell & Tuke, engineers, 25, Brazennose Street, Manchester, and plans may be inspected either at their offices or at the offices of the U.D.C. at Altrincham.

IRON AND STEEL.

August 31. Dundee.—*Supply and delivery of about 300 tons of steel girder tramway rails and fixings, also for steel points and crossings.* Specifications, schedules of quantities, and forms of tender may be obtained on application to J. Thomson, Burgh engineer, Municipal Offices, 91, Commercial Street, Dundee, on payment of £2 2s. Sealed tenders, endorsed "Rails and Fixings, &c.," must be lodged with W. H. Blyth Martin, town clerk, City Chambers, Dundee, not later than August 31.

PAINTING AND PLUMBING.

Sept. 3. Sculcoates.—*Painting, &c., at the Relief Station, Fern Street, Hull*, for the Guardians of the Poor of the Union. Forms of tender and all particulars can be obtained, or will be sent by post, on application to J. H. Wild, solicitor, clerk to the Guardians, Union Offices, Harley Street, Hull. Tenders must be sent to J. H. Wild so as to be received not later than 10 o'clock a.m. on Sept. 3.

Sept. 4. Leeds.—*Whitewashing, distempering, and painting the Kingston Unity Club*, Union Street, Leeds. Specifications may be seen any night, from 7 to 9 o'clock. Tenders to be in not later than Sept. 4, addressed to the Secretary, S. Scott.

Sept. 4. Uxbridge.—*Painting and decorating at the Young Men's Institute*, Lawn Road, Uxbridge, in conformity with specifications prepared by J. Freebairn Stow, Uxbridge, at whose office further particulars may be obtained and specifications examined. Sealed tenders, endorsed "Tenders for Painting and Decorating," are to be addressed to J. W. Sturgess, hon. secretary, and delivered at the Institute not later than 4 p.m. on Sept. 4.

Sept. 6. Greenwich.—*Painting the outside of the water tank* at the Grove Park Workhouse. Specification and form of tender can be obtained at the Clerk's Office, Union Workhouse, East Greenwich, and must be returned before Sept. 6, on which day they will be opened at a meeting of the Guardians.

Sept. 6. Prestwich.—1, *Painting the outside of Prestwich workhouse, tramp wards and outbuildings, Delaunays Road, Crumpsall.* 2, *Painting and limewashing the inside of the said workhouse.* Specifications may be obtained at the workhouse between the hours of 2 and 4 p.m., on application to the Workhouse Master, W. T. Jones. Tenders, endorsed "Tender for Painting," to be addressed to E. W. Ogden, clerk, Union Offices, Cheetham Hill Road, Manchester, and delivered by 10 a.m. on Sept. 6.

Sept. 10. Colchester.—*Internal painting, distempering, whitewashing, &c., at the Town Hall.* Conditions of contract, specification, quantities, &c., may be obtained upon application to H. Goodyear, A.M.I.C.E., borough engineer and surveyor, Borough Engineer's and Surveyor's Office, Town Hall. Sealed tenders, endorsed "Painting, &c., Town Hall," must be delivered to him not later than Sept. 10.

Sept. 12. London, E.—*Painting, cleansing, repairs, &c., of public buildings, &c,,* for the County Borough of West Ham. Specification, form of tender, and further particulars may be obtained at the office of J. G. Morley, borough engineer, Town Hall, West Ham, E., upon payment of £1. Tenders, endorsed "Tender for Painting, &c., Works," to be sent to F. E. Hilleary, town clerk, Town Hall, West Ham, E., not later than 4 o'clock on Sept. 12. The contractor will be required to enter into a bond with one surety for the due performance of the contract, and no work will be ordered under the contract until such bond has been duly executed. Fair wages clause.

ROADS AND CARTAGE.

August 30. Edinburgh.—*New granite causeway on the carriage way of Melville Drive (West of Marchmont Road), also for hard Whinstone causeway on carriage way of London Road (South side); opposite Parson's Green Terrace)*, for the Corporation. Schedules, specifications, and tender forms may be obtained on application to the City Road Surveyor, City Chambers. Tenders, sealed within the official envelope supplied, must be lodged with T. Hunter, town clerk, City Chambers, Edinburgh, Aug. 30.

August 30. Woking.—*Supply of 1,200 tons, more or less, of 2-in. basalt*, for the U.D.C, to be delivered free at Woking Station during the months of November and December. Tenders, endorsed "Road Material," together with sample of the stone to be supplied, are to be sent to G. J. Wooldridge, surveyor, Council Offices, Woking, not later than August 30. The Council reserve to themselves the right to apportion the contract as they deem fit.

August 31. London, N.E.—*Alterations and additions to the permanent way* for the Walthamstow Urban District Council. Persons desirous of submitting tenders may obtain drawings, conditions of contract, specification, and form of tender from G. W. Holmes, A.M.I.C.E., Town Hall, Walthamstow, on payment of £5 as a deposit. The form of tender and schedule must be properly and fully filled in and enclosed with the specification in a sealed envelope, marked on the outside "Tender for Alterations and Additions to Permanent Way," and delivered to C. S. Watson, Town Hall, Walthamstow, not later than August 31. Fair wages clause.

Sept. 1. Lymington.—*Supply and delivery (by rail or water) of about 225 tons of Guernsey, Cornish or other granite, broken to 2-in. gauge, and about 25 tons of granite chippings broken to ¾-in. gauge.* Samples to be forwarded to F. H. Parr, borough surveyor, and tenders (without forms), endorsed "Tender for Granite," to be sent to J. D. Rawlins, town clerk, Town Clerk's Office, Lymington, Hants, not later than Sept. 1.

Sept. 3. Vicksburg, Miss.—*Paving and Sewering.* Sealed proposals to pave and sewer Washington Street, from Glass Bayou Bridge to Harris Street, will be received and opened by the Mayor and Aldermen Mayor's Office, of this city, on Sept 3, 1906. Plans and specifications can be had on application to H. J. Trowbridge, city clerk.

Sept 3. Stretford.—*Paving, &c., in the following streets and passages* for the U.D.C. :—*(a)* Trafford Park Road; *(b)* Wilson Street; *(c)* Nansen Street; *(d)* Passage, 29-81, Jackson Street, and 23-37, Pinnington Lane. *(e)* Passage, 48-84, Victoria Road. The drawings and specification may be seen, and form of tender with schedule of quantities and other particulars obtained on application to E. Worrall, the Council's surveyor, any day during office hours on payment of a deposit by cheque of £2 2s. Sealed tenders, endorsed "Private Street Works." addressed to the Chairman of Highways, are due at the Council Offices by 12 noon on Sept. 3.

Sept. 3. Ballyclare.—*Construction of three footpaths in the town of Ballyclare* for the U.D.C. Specifications thereof have been prepared by the Council's surveyor, and can be inspected by intending contractors of E. Hill, clerk to the Council, Town Clerk's Office, Ballyclare, any day, except Sunday, between the hours of 11 o'clock a.m. and 4 o'clock p.m., on payment of a deposit fee of £1. Tenders must be made on the forms supplied and must be sent by post, addressed "Clerk of Urban District Council, Ballyclare," in a properly sealed and stamped envelope (marked "Tender" on the outside and bearing the number of the work tendered for), so as to be received by the clerk not later than 5 o'clock p.m. on Sept. 3.

Sept. 4. Tynemouth.—*Executing the following street works* for the County Borough :—1, Laying tar macadam, &c., in Beverley Gardens, Cullercoats. 2, Laying tar macadam, &c., in Drummond Terrace, North Shields. Plans and specifications may be seen at the office of J. F. Smillie, borough surveyor, to whom sealed and endorsed tenders are to be sent not later than 12 noon on Sept. 4.

Sept. 4. London, S.E.—*Kerbing, channelling and metalling the roadway and paving the footpaths with artificial stone* (in separate contracts) of Buckthorne Road, Aigiers Road, Eddystone Road, and Holdenby road (part of), Lewisham. The plans and specifications may be seen and forms of tender obtained at the Town Hall, Catford (Surveyor's Department). Copies of the specification may also be had on payment of the sum of 5s. in each case The tenders must be on forms issued by the Council, enclosed in an envelope, sealed and endorsed "Tender for ——," and must be delivered by 4 o'clock on Sept. 4, at the Town Hall and placed in the box there provided for the purpose. The works must be proceeded with immediately on acceptance of tender and execution of contract, and the contractor must employ local labour as far as practicable in carrying out the work. Fair wages clause.

Sept. 4. Walsall.—*Supply of 5,500 tons of granite setts* for tramway purposes, 5ins. by 5ins. by 4ins., varying in length from 5ins. to 9ins. Copies of specification and form of tender may be obtained, on application, at the Borough Surveyor's Office, Council House, Walsall. Fair wages clause. Tenders, sealed and endorsed "Tender for Tramway Setts," are to be sent to J. R. Cooper, town clerk, Council House, Walsall, on or before Sept. 4.

Sept. 4. Woodford.—*Supply of broken Quenast or Guernsey granite* of 1½-in. and 2-in. gauge, delivered free in trucks at Woodford and George Lane Stations as and when required until July 31, 1907, for the U.D,C., in accordance with the specification to be obtained on application. Samples to be delivered free with each tender. Sealed tenders, endorsed "Tender for Broken Granite," to be delivered not later than noon on Sept. 4, to W. Farrington, Surveyor to the Council, Council Offices, Woodford Green.

Sept. 5. Cardiff.—*Widening and improving of the Caerphilly and Nantgarw main road* between the "Piccadilly Inn," Caerphilly, and Castle Farm, and in forming a stone depôt. Fair wages clause. Plan and specification of the work may be seen and copies of the quantities obtained at the police station, Caerphilly, and of T. M. Franklen, clerk of the C.C., Glamorgan C.C. Offices, Westgate Street, Cardiff. Sealed tenders, made out on the bill of quantities supplied, are to be delivered to him, together with two substantial sureties, not later than Sept. 5, marked outside "Tender for Caerphilly Improvement."

Sept. 5. Hove.—*Providing and laying 1,340yds. superficial tarred macadam in Sackville Road.* Specification may be seen, and particulars, with forms of tender, obtained at the office of H. H. Scott, borough surveyor. Tenders, on forms supplied, addressed to H. Endacott, town clerk, Town Hall, Hove, and endorsed "Tender for Tar-Paving Works," will be received up to 6 o'clock on Sept. 5.

Sept. 5. Failsworth.—*Private street improvement works* requited to be executed in Stott Street and William Street, Failsworth, for the U.D.C. Plans and specifications may be seen, and forms of tender with quantities obtained at the surveyor's office, Town Hall, Failsworth. Tenders, endorsed "Tender for Private Street Works," must be delivered to H. C. Broome, clerk to the Council, Failsworth, not later than 12 o'clock noon, on September 5.

Sept. 6. Arundel.—*Kerbing, channelling, and making up about 400 square yards of Wood View Road and Ford Road, Arundel,* for the Town Council. The works include about 580 yards of Norwegian granite kerb and brick channelling. Plans and specifications may be seen, and form of tender and quantities obtained on payment of 10s. 6d. on application to E. F. Farrington, borough surveyor, Town Hall, Arundel. Sealed tenders, marked "Tender for Street Works," to be delivered to A. Holmes, town clerk, Arundel, not later than 5 p.m. on Sept. 6.

Sept. 8. Carmavey.—*Making of a concrete walk and edgings* for the Committee of Carmavey Graveyard. Specification and plan can be seen at the caretaker's house. Tenders will be received up to Sept. 8, by W. P. Dickie, secretary, Ballysculty Muckamore.

Sept. 8. Chorlton-cum-Hardy.—*Several works required in making up Newport Road, Hartley Road, Lynton Road, Chepstow Road, Crescent Road,* Chorlton-cum-Hardy, for the Withington Committee. Plans, sections, and specifications of the work can be seen, and a form of tender, with quantities, and any further information obtained from the surveyor to the Committee, Town Hall, West Didsbury. Tenders to be endorsed "Tenders for Street Works," and to be addressed to the chairman of the Withington Committee, Town Hall, West Didsbury, and delivered not later than noon on September 8.

Sept. 10. Batley.—*Levelling, paving, flagging, channelling, and completing of each of the following streets.*—Back Henrietta Street, Ambler Street, Villiers Street, Stralau Street, Prospect Street, Ings Road, and Prince Street, in the same Borough. Plans, sections, and specifications of the said works respectively may be seen on application to the Borough Engineer and Surveyor, O. J. Kirby, whose offices are at the Town Hall, Batley. Sealed tenders (on forms which may be obtained of the Borough Surveyor, properly endorsed, to be delivered to J. H. Craik, town clerk, Town Clerk's Office, not later than Sept. 10.

Sept. 10. Dover.—*Supply and delivery of* 1,500 tons of broken Guernsey granite; 250 tons of ¾-in. granite chippings; 250 tons of ⅜-in. granite siftings; 300 tons of quartzite. Forms of tender and specification may be obtained at the office of the Town Clerk, Castle Hill House, Dover, during office hours. Tenders, endorsed "Tender for Road Material," to be sent to W. Knocker, town clerk, Town Clerk's Office, Castle Hill House, Dover, on or before Sept. 10.

SANITARY.

August 30. Ferryhill, co. Durham.—*Contract No. 1.—The construction of about 1,300 lineal yards of 12-inch and 9-inch sewers, together with manholes, lampholes, precipitation tanks and other works in connection therewith* at Ferryhill, in the County of Durham, for the Sedgefield R.D.C. Drawings may be seen and specification quantities, and form of tender obtained at the office of the engineer and surveyor, J. Stones, Sedgefield, on a payment of £1 1s. Tenders endorsed "Ferryhill Sewerage" must be delivered to J. W. Lodge, clerk to the Council, Sedgefield, not later than August 30.

Sept. 4. High Ham.—*Carrying out a new system of drainage at the Langport Union Workhouse,* in the parish of High Ham, according to the plans and specification of Samson & Cottam, architects for the R.D.C. The plans and specification can be inspected at the office of E. Q. Louch, solicitor, clerk to the Council, between the hours of 10 o'clock in the forenoon and 2 o'clock in the afternoon. Sealed tenders, endorsed "Workhouse Drainage," must reach him not later than 9.30 o'clock in the morning of Sept. 4.

Sept. 5. Failsworth.—*Works of sewering, levelling, kerbing, paving, channelling, &c.,* of the following Passages within the District of Failsworth, for the U.D.C.—namely: Rear of Nelson Street and Brook Street; rear of 56 to 78, Oldham Road; rear of 51 to 63, Hobson Street; rear of 1 to 9, Corn Street; rear of 6 to 14, Peel Street; rear of Peel Street and Nelson Street; rear of 90 to 112, Oldham Road, off Victoria Street. Plans and specification may be seen and forms of tender, with quantities, obtained at the Surveyor's Office, Town Hall, Failsworth. Tenders, endorsed "Tender for Private Street Works," must be delivered to H. C. Broome, clerk to the Council, not later than 12 o'clock noon on Sept. 5.

Sept 10. Bucharest (Roumania).—*Construction of drains.* 157.565 dinars; deposit 16,000 dinars. Specifications and particulars may be obtained on application to Magistrat der Stadt, Bucharest. Tenders should be sent in not later than Sept. 10.

Sept. 11. Llanfrechfa Upper.—*Sewerage contractors for the construction of main sewers and outfall works* for the U D.C., comprising abont 2,368 lineal yards of 9-in. and 15-in. stoneware pipe sewers, 141 lineal yards 9-in. and 15 in. cast-iron pipe sewers, with necessary manholes, settling tanks, &c. Plans may be seen and copy of specification and bill of quantities obtained on payment of £2 2s. at the office of I. Jones, clerk to the Council, Haddon House, Pontnewydd, Newport, Mon., by whom tenders will be received not later than noon on Sept. 11.

MISCELLANEOUS.

Sept. 11. Newcastle-on-Tyne.—*Supply of rails, points, and crossings, together with the necessary fishplates, tie rods, bolts, and nuts,* in connection with the renewal and extension of a double junction in Northumberland and Blackett Streets for the Tramways Committee of the Corporation. Alternative offers are asked for—(1st) in hardened cast steel points and crossings and rolled steel rails; (2nd) in manganese steel throughout. Plans may be seen, and specifications, schedule of quantities and form of tender obtained, at the office of the City Engineer, Town Hall, Newcastle-upon-Tyne, on payment of £1 1s. Tenders, endorsed "Tender for renewal, &c., of Northumberland Street junction," and addressed to the Chairman of Tramways Committee, to be delivered at the City Engineer's office, on or before Sept 11.

Sept. 29. Gosport and Alverstoke.—*Supply of the following materials,* &c., for the year ending Sept. 29, for the Gosport and Alverstone U.D.C. Broken stone for macadamising; kerb, channel and sets; artificial paving stone; stoneware draining pipes; cement and lime; castings; ironmongery. Specifications, forms of tender, &c., may be obtained from the Surveyor to the Council, H, Frost, Town Hall, Gosport, Tenders, sealed and endorsed "Tender for ——," as the case may be, should be delivered, with any necessary samples, at the offices of the Council not later than 12 o'clock noon on Sept. 13. Fair wages clause.

TOO LATE FOR CLASSIFICATION.

Sept. 1. Dunfermline.—*Painter work proposed to be executed on new dormitory and day room wing, and new kitchen and laundry offices, at Dunfermline Poorhouse,* for the Dunfermline Poorhouse Combination Committee. Schedules of measurements may be had on application to Andrew Muirhead, architect and surveyor, 4, Abbey Park Place, Dunfermline, and sealed and endorsed tenders, marked on outside, "Tender for Painter Work, Dormitory and Kitchen Wing," to be lodged with J. Devlin, Governor, Dunfermline Poorhouse, not later than Sept. 1.

Sept. 3. Grimsby.—*Erection of a Public Convenience,* to be situated in the Duke of York Gardens, Welsh Marsh. Copy of Plans, Schedule of Quantities and Forms of Tender can be obtained of H. G. Whyatt, Borough Engineer and Surveyor, Town Hall Square, Grimsby, on deposit of £1 1s. Tenders endorsed "Public Conveniences, Duke of York Gardens," to be addressed to the Chairman of the Parks Committee, and to be delivered at the Town Clerk's Office, St. Mary's Chambers, Grimsby, not later than noon on Sept. 3.

Sept. 4. Sandown.—*Alterations and additions to the Town Hall* for the U.D.C. Plan and specification may be seen at the office of the Surveyor, Town Hall, Sandown, between the hours of 9.30 and 10 a.m. and 2.30 and 3 p.m. Tenders, endorsed "Town Hall Alterations," must be sent in so as to be received by W. H. Wooldridge, clerk to the Council, Town Hall, Sandown, not later than 12 noon on Sept. 4.

Sept. 5. Llandyfriog.—*Building a house at Llandyfriog,* near Newcastle, Emlyn. Plans and specification can be seen and bills of quantities obtained from either J. D. Roy Evans, solicitor, Newcastle Emlyn, or from J. Coates Carter, architect, Bank Buildings, St. Mary Street, Cardiff. Tenders to be in by Sept. 5.

Sept. 5. Penrhiwceiber.—*Erection of 40 cottages at Penrhiwceiber* for the Cynon Cottage Company (Limited). Sealed endorsed tenders to be delivered to the secretary, J. H. Richards, Miskin Terrace, Mountain Ash, on or before Sept. 5. Plans and specification may be inspected at the office of T. W. Millar, architect and surveyor, Mountain Ash.

Sept. 5. Bangour.—*Alterations proposed to be executed on the farm house at Bangour and also for the verandahs round the closed homes,* for the Edinburgh District Lunacy Board. The relative specifications may be obtained on application to H. J. Blanc, R.S.A., architect, 25, Rutland Square, Edinburgh. The plans may also be seen at the architect's office, and at Bangour. The offers shall be lodged with J. Kyd, clerk and treasurer, District Board of Lunacy, Castle Terrace, Edinburgh, not later than September 5. In the event of the contractor deciding not to tender after receipt of the documents, these are required to be returned.

Sept. 8. Cardiff.—*External painting at Headquarters Homes, Ely,* according to specification, a copy of which, together with forms of tender, may be obtained from A. J. Harris, clerk, Union Offices, Queen's Chambers, Cardiff. Forms of tender, with specification attached, must be returned to the Clerk, under cover, endorsed, "Tender for External Painting, Ely," so as to reach him not later than 10 a.m. on Sept. 8.

Sept. 8. Glamorgan.—*1. New Police Station at Glyn-Neath. 2. Alterations and Additions at the Bridgend Police Court Buildings* for the Standing Joint Committee of the Glamorgan Quarter Sessions and C.C. Plans and specifications of the respective works may be seen and copies of the bills of quantities obtained at the following places :—Work No. 1, at the county police station, Neath; work No. 2, at the county police station, Bridgend; and for each of the works at at these offices. Fair wages clause. Sealed tenders are to be delivered to T. M. Franklen, clerk of the County Council, Glamorgan C.C. offices, Westgate Street, Cardiff, together with the full names and addresses of two substantial sureties, not later than Sept. 8, marked outside "Tender for Glyn-Neath Police Station," or "Tender for Alterations to Bridgend Police Court Buildings," as the case may be.

Sept. 11. Shrewsbury.—*Paint, &c., the Exterior Iron and Wood Work. &c., of the General Market, Corn Exchange, Butchers' Market, Arcade, Tower, and the Roofs over Claremont Street, &c.* Specification may be seen and printed form of tender obtained at the Office of W. C. Eddowes, borough surveyor, Borough Surveyor's Office, The Square, on payment of £1. Sealed tenders, addressed to the Town Clerk, Guildhall, to be delivered on or before Sept. 11.

Sept. 11. Crewe.—*Making of the back passages leading from Walthall Street to Westminster Street, and behind Lewis Street,* within the borough, in accordance with plans, sections and specifications, which may be seen and all other necessary information obtained upon application to G. E. Shore, borough surveyor, Earle Street, Crewe. The contractor must provide the whole of the materials required in the making of the above passages. A deposit of £1 will be required. Sealed tenders and schedule of prices, upon printed forms to be obtained from the borough surveyor, must be delivered to F. Cooke, town clerk, Municipal Offices, Crewe, not later than nine o'clock in the forenoon of September 11, endorsed "Tender for Back Passage Making." No tender will be accepted unless made out on the printed form above named, with all the items in the schedule of prices fully priced.

Sept. 15. Vienna (Austria). *Construction of a section of the railway from Trient to Malo,* Specification and particulars may be had on application to Eisenbahnbaudirektion, VI., Gumpendorferstrasse 10, Vienna. Tenders must be sent in by Sept. 15.

No date. Long Eaton.—*Contract No. 1: For the erection of a small factory at Long Eaton, together with engine-room, boiler-house, chimney, &c. Contract No. 2: For the erection of a residence on the Derby Road, Long Eaton, together with outoffices, &c.* Persons desirous of tendering for either or both of the above works are requested to make written application immediately to Ridgway & Smith, architects, 28, Market Place, Long Eaton. A copy of the bill of quantities will be forwarded to applicants on payment of a deposit of £1 1s. for each contract.

Current Market Prices.

FORAGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	14	0	1	16	0
Clover, best...	per load	4	4	0	4	15	0
Hay, good	do.	3	17	6	4	2	6
Sainfoin mixture	do.	4	0	0	4	7	6
Straw...	do.	1	8	0	1	14	0

MISCELLANEOUS.

		£	s.	d.	£	s.	d.
Bricks Stocks, d/d to job	per 1,000	1	15	0	—		
Do. Flettons on rail ...	do.	1	5	0	—		
Do. Pressed Wire Cuts, d/d to job ...	do.	1	17	0	—		
Do. Blue brindled wire cuts	do.	1	2	0	—		
Do. do. wire cuts ...	do.	1	6	0	—		
Do. do. pressed facings	do.	1	17	6	—		
Coke Breeze, into carts at gasworks ...	per load	0	2	0	—		
Do. d/d to job	do.	0	4	0	—		
Sand	per yard	0	7	6	—		
Ballast	do.	0	6	6	—		
Granite Chippings ...	do.	0	10	6	—		
Do. do. ¼in. ...	do.	0	11	6	—		
Do. Broken, 1½in. ...	do.	0	15	6	—		
Do. do. 2in. ...	do.	0	15	0	—		
Do. do. 2½in ...	do.	0	14	6	—		
Do. Kerb, Norwegian 6×12 and 12×6 in river	per foot	0	1	2	—		
Do. do. do. circular	do.	0	1	5	—		
Do. do. do. 12×8 in river	do.	0	1	5	—		
Do. do. do. circular	do.	0	1	8	—		
Do. do. Guernsey 6×12 in river	do.	0	1	4	—		
Do. do. do. circular	do.	0	1	6	—		
Do. do. do. 12×6 do.	do.	0	1	6	—		
Do. do. do. do.	do.	0	1	8	—		
Do. do. do. 18×8 do.	do.	0	1	8	—		
Do. do. do. do.	do.	0	1	10	—		
Do. Pitchings, Norwegian, 3×6	per ton	1	8	0	—		
Do. do. do. 3×7	do.	1	10	0	—		
Do. do. do. 3×5	do.	1	9	0	—		
Do. do. do. 4×5	do.	1	8	0	—		
Do. do do. 4×4	do.	1	13	0	—		
Do. do. do. 4×6	do.	1	5	0	—		
Do. do. do. 5×6	do.	1	4	0	—		
Do, do. do. 5×7	do.	1	4	0	—		
Do. do. do. Special, 4×6	do.	1	11	0	—		
Do. do. do. do. 5×7	do.	1	18	0	—		
Do. do. Guernsey, 3×6	do.	1	10	0	—		
Do. do. do. 3×7 & 3×9	do.	1	8	6	—		
Do. do. do. 3×5	do.	1	10	0	—		
Do. do. do. 4×5	do.	1	10	0	—		
Granite, Pitchings, Guernsey, 4×4	do.	1	13	0	—		
Do. do. do. 4×6	do.	1	9	0	—		
Do. do. do. 4×7	do.	1	6	6	—		
Do. do. do. 5×6	do.	1	6	0	—		
Do. do. do. 5×7	do.	1	5	0	—		
Do. do. Specials add.	do.	0	6	0	—		
Glass, English Sheet, in crates of stock sizes, 15oz., 2nds	per sq. ft.	0	0	3½	—		
Do. do. do. do. 3rds.	do.	0	0	2½	—		
Do. do. do. 21 oz. 2nds	do.	0	0	5	—		
Do. do. do. do. 3rds	do.	0	0	3½	—		
Do. do. do. 26 oz. 2nds	do.	0	0	6	—		
Do. do. do. do. 3rds	do.	0	0	4¼	—		
Do. do. do. 32 oz. 2nds	do.	0	0	8	—		
Do. do. do. do. 3rds	do.	0	0	6	—		
Do. English patent plain rolled plate in stock crates ⅛	do.	0	0	2	—		
Do. do. do. $\frac{3}{16}$	do.	0	0	2¼	—		
Do. do. do. ¼	do.	0	0	2½	—		
Do. Atter (Abo.) do. & White, Inf. 5th, 3×8	do.	8	10	0	—		
Do. do. (do.) Yellow, unsorted, 3×9	do.	9	10	0	—		
Do. Constantza, White, 3rd, 3×11	do.	9	10	0	—		
Cement	per ton	1	12	0	—		
Lime	do.	1	4	0	—		
Castor Oil, French ...	per cwt.	1	10	0	1	2	0
Colza Oil, English ...	do.	1	8	6	—		
Copperas	per ton	2	0	0	—		
Lard Oil	per cwt.	2	15	0	2	17	0
Lead, white, ground, carbonate	per ton	16	0	0	—		
Do. red	do.	15	0	0	19	0	0
Linseed Oil, barrels ...	per cwt.	1	0	6	—		
Petroleum, American ...	per gal.	0	0	6⅜	0	0	6½
Do. Russian ...	do.	0	0	5⅞	0	0	6
Pitch	per barrel	0	9	0	—		
Shellac, orange	per cwt.	10	15	0	10	16	0
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Town	per cwt.	1	7	6	1	8	6
Tar, Stockholm	per barrel	1	5	0	—		
Turpentine	per cwt.	2	7	0	—		

METALS.

		£	s.	d.	£	s.	d.
Standard Copper	per ton	84	10	0	85	0	0
Do. Strong sheets ...	do.	96	10	0	97	0	0
Lead, soft foreign	do.	17	0	0	17	10	0
Do. English	do.	17	5	0	17	10	0
Do. pipes...	do.	20	0	0	20	10	0
Do. sheets	do.	19	10	0	20	0	0
Galvanised Corrugated sheets	per ton	12	10	0	12	12	6
Spelter G.M.	do.	27	0	0	27	5	0
Angles, Scotland	do.	6	17	6	7	0	0
Bars, do.	do.	7	15	0	8	0	0
Marked bars, Staffs. ...	do.	8	10	0	8	12	6
Common bars, do. ...	do.	6	5	0	6	7	6
Angles, M'boro.	do.	6	5	0	6	10	0
Joists do.	do.	6	2	6	6	5	0
Angles, Midlands	do.	6	10	0	6	15	0
Joists do.	do.	6	15	0	7	0	0
Girder plates, Midlands ...	do.	7	7	6	7	10	0
Angles, Foreign, c.i.f. Thames	do.	6	7	6	6	10	0
Tees do. do. do.	do.	6	10	0	6	12	6
Joists, do. do. do.	do.	6	2	6	6	4	0
Channels do. do. do.	do.	6	7	6	6	8	6
Plates do. do. do.	do.	6	17	6	7	2	6
Tin, Foreign	do.	183	0	0	184	0	0
Do. English ingots ...	do.	183	0	0	184	0	0
Zinc, sheets, Silesian ...	do.	27	0	0	27	10	0

TIMBER.

		£	s.	d.	£	s.	d.
Deals, Archangel Yellow (Tchoodinoff's) 2nd, 4×9	per std.	16	10	0	—		
Do. do. do. 3rd, 4×9	do.	12	5	0	—		
Do. Asbacka, Yellow, 4th, 3×9	do.	10	10	0	—		
Do. Nederkalix, Yellow, 1st, 2½×7	do.	11	0	0	—		
Do. do. do. 2nd, 2½×7	do.	10	5	0	—		
Do. St. Petersburg, White, 3rd, 3×9	do.	9	0	0	—		
Do. do. Yellow, 3rd, 2½×7	do.	9	10	0	—		
Do. Skelleftea, Yellow, 5th, 3×9	do.	9	15	0	—		
Do. Rafso, Yellow, 4th, 2½×7	do.	9	5	0	—		
Battens, Dram, Yellow (planed) unsorted, 1×9	do.	8	15	0	—		
Do. Fredriksstad, Yellow (planed), 3rd, ⅞×9	do.	9	0	0	—		
Do. do. do. do. ⅝×9	do.	9	15	0	—		
Do. do. do. unsorted 1×9	do.	9	10	0	—		
Do. Hudikswall, Yellow, Inf., 5th, 2×7	do.	8	15	0	—		
Do. Raumo, Yellow, 1st & 2nd, 2×4	do.	10	0	0	—		
Do. Oscarshamn, Yellow, 1st & 2nd, 2×9	do.	9	0	0	—		
Do. do. do. do. 2×8	do.	9	5	0	—		
Do. do. do. do. 2×7	do.	9	5	0	—		
Do. St. Petersburg, Yellow, 3rd, 2½×6½	do.	8	10	0	—		
Do. do. do. do. 2½×6	do.	8	10	0	—		
Do. do. do. do. 2×5	do.	9	0	0	—		
Do. do. White, 3rd, 2×9	do.	9	10	0	—		
Do. Skelleftea, Yellow, 2nd, 2×8	do.	9	10	0	—		
Do. Saudo, White, 1st & 2nd, 2×4	do.	9	5	0	—		
Do. Sornas, Yellow, 1st & 2nd, 2×4½	do.	9	0	0	—		
Do. Sandarne, White, 1st, 1×9	do.	10	15	0	—		
Do. do. do. (planed) 2nd, 1¼×11	do.	9	15	0	—		
Do. Skonvik Yellow 1st, 1×9	do.	12	0	0	—		
Do. do. do., 2nd 1×9	do.	9	15	0	—		
Do. do. do., 3rd, 1×9	do.	8	0	0	—		

		£	s.	d.	£	s.	d.
Flooring Boards, Dram Yellow, unsorted, 1×7	per ton	0	9	9	—		
Do. do. do. 1×6½	do.	0	9	0	—		
Do. do. White, ⅞×6½	do.	0	8	6	—		
Do. do. Yellow, ⅞×5½	do.	0	8	6	—		
Do. do. White, ⅞×5½	do.	0	8	0	—		
Do. Mo. & Domsjo Yellow, dry 2nd, ¾×5	do.	0	7	9			
Do. do. do. ¾×4½	do.	0	7	9			
Do. do. Fredriksstad Yellow, 2nd, ⅞×6	do.	0	9	3	—		
Do. do. do. ⅞×5½	do.	0	8	9			
Do. do. 3rd 1¼×7	do.	0	11	9	—		
Do. do. do. 1×7	do.	0	10	0	—		
Do. do. do. 1×6	do.	0	9	9	—		
Do. do. do. ¾×7	do.	0	8	6	—		
Do. do. do. unsorted 1¼×7	do.	0	12	3	—		
Do. do. do. 1×5½	do.	0	9	6	—		
Do. do. do. 1×4½	do.	0	8	6	—		
Do. do. do. ⅞×7	do.	0	9	0	—		
Do. do. do. ⅞×6	do.	0	9	0	—		
Do. do. do. ¾×7	do.	0	8	6	—		
Do. do. do. ¾×6	do.	0	8	0	—		
Fredriksstad, White, unsorted 1¼×6	do.	0	9	6	—		
Do. do. do. 1×4	do.	0	7	6	—		
Do. do. do. ⅞×6	do.	0	8	6	—		
Do. do. do. ⅞×5	do.	0	7	9	—		
Do. do. do, ¾×6	do.	0	7	6	—		
Do. do. mixed White, 1×7	do.	0	10	6	—		
Do. Skonvik, Yellow 1st 1×7	do.	0	12	0	—		
Do. do. do. 1×6	do.	0	11	3	—		

Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, *Great New Street, Fetter Lane, E.C.*

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Buntingford (Herts).—Accepted for the construction of new waterworks for the Buntingford R.D.C. :—

Grounds and Newton, Page Green, South Tottenham	£3,164 6 2

Charfield (Glos.).—For the erection of a pair of labourers' cottages at Starveall Farm, for the Governors of Katharine Lady Berkeley's Grammar School. Messrs. Thomas Scammell, Son & Perkins, architects and surveyors, Bristol and Wotton-under-Edge, Glos. :—

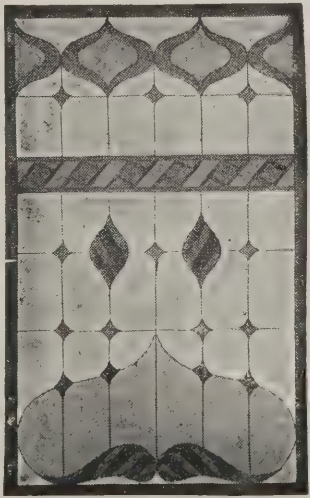
E. Clarke, Fishponds	£500
S. J. Simmonds, Rangeworthy	496
W. Blaken, North Nibly	4-3
W. Pitcher, Thornbury	450
A. Jotcham, Wotton-under-Edge	439
J. Brown. Bristol	430
*J. Hawkins & Sons, Ridgeway	395

* Accepted.

Wotton-under-Edge (Glos.).—For repairs and alterations to Dr. Boyce's house, "The Chipping," for the Governors of Katharine Lady Berkeley's Grammar School. Messrs. Thomas Scammell, Son and Perkins, architects and surveyors, Bristol and Wotton-under-Edge, Glos. :—

A. Jotcham	£127 0 0
R. Cook	110 15 0
R. Keynton	109 10 0
J. Jotcham...	102 10 0
J. Hawkins,* Ridgeway	98 10 0
W. Pitcher, Thornbury	98 10 0

(Rest of Wotton-under-Edge.)
*Accepted.



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Buglawton.—For the construction of about 1,965 yards of 6-in., 9-in., and 12-in. pipe sewers, with the necessary manholes, lampholes, ventilating shafts, and other works connected therewith, for the Buglawton U.D.C. Mr. C. Russell Hall, engineer, Chapel Street, Congleton :—

W. Jowett, Alexandra Terrace, Prescott...	£1,425	12	6
I. Dean & Co., 177, Stockport Road, Manchester	1,417	14	2
J. Stringer, Sandbach	1,374	14	9
F. Barke, Stoke-on-Trent	1,250	0	0
H. E. Buckley, Swan Arcade, Bradford	1,244	6	0
Sanders & Torrance,* Hanley, Staffs	1,094	15	0

* Accepted.

Herne Bay.—For levelling, paving, sewering, &c., Western Esplanade and St. George's Parade, for the Herne Bay U.D.C. Mr. F. W. J. Palmer, C.E., surveyor :—

T. Adams, Wood Green...	£5,837	0	0
J. Browning, Canterbury	5,389	0	0
A. and B. Hanson, Southall	4,986	0	0
S. H. Head, Herne Bay	4,933	0	0
Ingleton Bros., Herne Bay	4,753	19	0
W. Johnson, Sheerness	4,450	0	0
Castle & Co., Garlinge...	4.444	16	6
Zadig & Co., London	4,158	0	0
Hardy, Bate and Co.,* Slough, Bucks	4,093	6	0

Accepted.

London, N.E.—For renovations to Clapton Park Chapel, for the Chapel Committee. Messrs. Cubitt & Manchip, architects :—

	Ancaster Stone.	Stucco Stone.
Lorden & Sons	£7.191	£3,232
Wm. Downs	5,560	3,046
Howell J. Williams, Ltd. ...	5,445	2,117
F. & H. F. Higgs, Ltd.	5,346	2,940
Trollope & Col's, Ltd.	5,284	3,140
Dove Bros., Ltd....	4,955	2,875
Shurmur & Sons	3,870	2.070
L. H. & R. Roberts	3,499	1.988
Cubitt & Co....	2,930	1,600

Plumstead.—For the construction of stables, &c., at 31, Plumstead Common Road, Mr. Fredk J. Gurney, architect and surveyor, 72, Cantwell Road, Shooter's Hill, S.E. :—

J. H. Sutch	£635
Thomas & Edge	625
A. J. Ware	579
Joseph Sanford	545
Sanford & Co.*	470

Architect's estimate £570.
* Accepted.

Sherburn (Durham).—For constructing sewage-purification works for the Durham R.D.C. Mr. G. Gregson, surveyor :—

R. Oliver, Durham	£1,497	17	9
J. Arundale's representatives, Bradford and Newcastle... ...	1,347	0	0
J. Carrick,* Durham	1,212	4	8
R. C. Birtley, Stanley	1,120	9	8

Surveyor's estimate, £1,300
* Accepted.

Teignmouth.—For laying and jointing about 17,110 lin. yds. of 9in., about 1,120 lin. yds. of 6in., and about 5,850 lin. yds. of 4in. British Mannesmann steel pipes, including haulage of pipes, erection of a meter-house, &c., for the Teignmouth U.D.C. Mr. Charles F. Gettings, Town Hall, Teignmouth, engineer :—

Uncorrected amounts.

Jenkins & Son, Leamington	£16,184	6	10
J. Weston, Kingsbridge	15,775	14	11
Meredith Bros., Gloucester	14,375	4	8
Pethick Bros., Plymouth...	13,980	0	0
J. Dickson, St. Albans	13,472	2	1
E. R. Lester, Plymouth	11,996	12	0
Moran & Son, London, S.W. ...	11,858	10	1
J. Shaddock, Plymouth	11,774	1	0
Matcham & Co., Plymouth	11,355	0	0
W. W. Perry, Exmouth	10,734	5	7
E. Tabor. Cambridge	10,507	7	1
R. H. B. Neal, Ltd., Plymouth ...	10,092	0	0
W. C. Shaddock, Plymouth	10,082	2	3
Pollard & Co., Taunton	9,844	7	2
W. Dobson, Edinburgh	9,705	1	3
A. E. Lunn, London, E.C.	9,676	8	8
J. H. Macdonald, Oxford	9,425	7	6
F. W. Vanstone & Sons, Paignton.	9,161	13	0
J. W. Thompson, Briton Ferry ...	8,717	12	10
Hawking & Best, Teignmouth ...	8,635	16	1
J. Riley, Cheltenham	8,253	13	9

Corrected amounts.

W. Mitchell & Sons, Manchester	8.483	9	3
W. Jones & Son, Neath	8.379	19	1
J. Moffat, Ellesmere...	8,294	13	9
H. E. Buckley, Bradford	7,987	8	0
Smith & Co., Westminster	7,224	11	2
M. Bridgman, Paignton	7,205	14	2
R. C. Brebner & Co.,* Edinburgh	7,147	0	0

*Accepted.

Wrexham.—For the erection of a new chapel in Victoria Road, for the Trustees of Hampden Road Wesleyan Church :—

R. Williams, Wrexham	£1,230	0	0
T. Williams & Sons, Southsea, near Wrexham	1,205	0	0
H. A. Jones, Wrexham	1,186	0	0
T. Ll. Davies, Ruabon	1,113	17	0
T. B. Woolley,* 68, Ruabon Road, Wrexham	1,100	0	0

*Accepted.

Bankruptcies.

Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—adjudication.

DURING THE WEEK ending August 24th twenty-six failures in the building and timber trades in England and Wales were gazetted.

C. MINERS, painter, St. Austell. R.O., Aug. 15.

A. WILSON, builder, Minster. Gross liabilities, £4,366.

F. W. PHILPOTT, builder, Canterbury. R.O., Aug. 18.

T. SNEAP, builder, Stapleford. Liabilities, £1,205.

G. W. MASON, plumber and painter, Swadlincote. R.O., Aug. 15.

G. E. CROXSON, engineer, Southend-on-Sea. R.O., Aug. 13.

R WHITEHEAD, slater, plasterer, painter and paperhanger, Rough Bank. R.O., Aug. 16

A. PORTER, builder and contractor, Ewerby. R.O., Aug. 18.

T. MCISAAC, builder and contractor, East Sheen. Adj., Aug. 15.

D. J. PHILLIPS, builder and contractor, Maesteg. R.O., Aug. 15.

F. RICHARDS, builder, Wolverhampton. Gross liabilities, £348—£293 to rank; assets, £240; deficiency, £53.

H. FOLEY, builder, Reading. First meeting, 14, Bedford Row, London, W.C., Aug. 29, at 12. P.E., Assize Courts, Reading, Oct. 11, at 2.

T. B. MCFARLANE, contractor, Willington. First meeting, O.R.'s, Sunderland, Aug. 30, at 3. P.E., Durham C.C., Sept. 25, at 10.40.

O. ELLIOTT, painter and decorator, Beeston. First meeting, O.R.'s, Nottingham, Aug. 29, at 11. P.E., Nottingham C.C., Oct. 5, at 10.30.

DYER & TAYLOR, builders and contractors, Halifax. First meeting, O.R.'s, Halifax, Aug. 30, at 3.30. P.E., Halifax C.C., Oct. 8, at 2. R.O., Aug. 16.

H. G. LANE, builder and decorator, Orpington. Gross liabilities, £4,016—£696 to rank for dividend; assets, £545; deficiency, £151.

C. MARLEY, plumber, South Bank, Yorks. First meeting O.R.'s, Middlesbrough, Aug. 31, at 12.30. P.E., Middlesbrough C.C., Aug. 31, at 10.30. R.O., Aug. 14.

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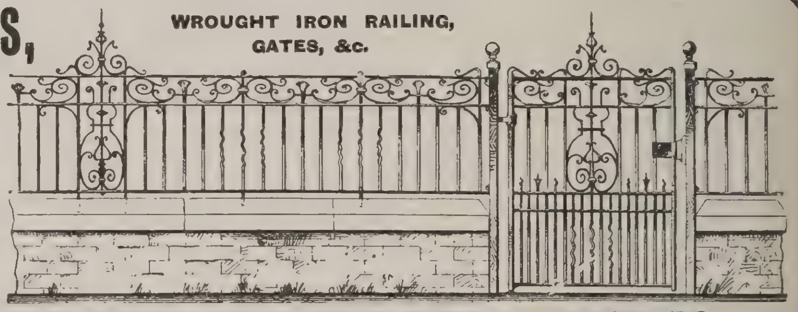

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THE BUILDERS' JOURNAL
AND ARCHITECTURAL ENGINEER.

August 29, 1906.

FIRE SUPPLEMENT (MONTHLY).

THE THERMAL CONDUCTIVITY OF CONCRETE & THE EFFECT OF HEAT UPON ITS STRENGTH & ELASTIC PROPERTIES.*

By Prof. Ira H. Woolson, M.E.

This paper is a record of some experiments made in continuation of work described in a previous paper before the American Society for Testing Materials.† That paper recorded a series of tests showing that both the strength and elasticity of concrete were rapidly diminished by the application of comparatively low heat for moderate periods of time. The results appeared quite contradictory to well-established evidence regarding the behaviour of that material in actual fires, and in fire tests of full size floor units. Endeavouring to elucidate this discrepancy, the writer made a single experiment on the conductivity of concrete which apparently explained the whole variation, and pointed to the fact that the virtue of concrete as a fire-resisting material was due to its

high non-conductivity.

The other tests showed that if it were thoroughly heated to 1,500° Fahr. its strength and elasticity were largely dissipated.

In the discussion which followed the reading of the paper it was suggested that further investigation of the conductivity of concrete should be made; also, that additional proof of the other results, using larger specimens and different concrete mixtures, was desirable. At the request of the Joint Committee on Concrete, the writer has continued the experiments, and this paper is a summary of the new data.

The actual work

of preparing and testing the specimens, making the calculations, and plotting the curves was done by students in the Department of Mechanical Engineering, Columbia University, under the writer's direction. This year the investigation was made by Messrs. R. M. Olyphant, junr., George W. Riddle and W. Putnam, students in the senior class, who did the work as a thesis problem. Their hearty co-operation and faithful attention to detail has alone made this paper possible.

The composition

used was the same as last year—namely, a 1-2-4 mixture of Portland cement, sharp sand and ¾-in. clean broken stone, both trap rock and limestone being employed. In addition to these, other specimens were made in the same proportions, using clean ½-in. quartz gravel instead of the broken stone, and, in another set, clean boiler cinders instead of stone. The cement was furnished by the committee and was said to be composed of a mixture of giant, lehigh and vulcanite. It was a slow-setting cement, taking 7hrs. and 40mins. for initial set, and 14hrs. 10mins. for hard set. The average strength neat for 1 day was 246lbs.; 7 days was 710lbs. Mixed with three parts sand, the average for 7 days was 160lbs., and for 28 days, 286lbs. The concrete was mixed moderately wet and well tamped. The specimens were left in the moulds 36hrs., then removed and submerged in water for 7 days, after which they were allowed to stand for 7 weeks in a cellar, being occasionally sprinkled.

Rise of Temperature Similar to Actual Fire Conditions.

It was suggested that instead of raising the temperature of the specimens very slowly, so that three or four hours were consumed in attaining a furnace temperature of 1,500° to 2,000° Fahr., as was done last year, it would be instructive to bring the furnace temperature rapidly up to some fixed point, then holding it there for a definite period, the idea being that duplicate tests would be easier and the conditions approach more nearly those of an actual fire. This was done in all cases in the present series of experiments; 1,500° Fahr. was adopted as a fair average, and the furnace raised to that temperature in 40min. to 60min. and held there for the balance of the test. It was thought unwise to raise the temperature faster than this for fear of producing internal stresses that might rupture the specimens. In one instance the furnace did not work properly, and the necessary heat was not secured in an hour. Three sizes of specimens were made: 4-in. cubes, 5-in. cubes and 6-in. × 6-in. × 14-in. prisms. The latter were used for measuring the elastic properties. The 4-in. cubes were made for comparing the strength of the new concrete with that of last year.

Method of Heating.

The specimens were heated in an oven-type of gas furnace. Those placed entirely inside the furnace were protected from the direct impact of the flames on the sides by shields of fire brick or clay tiles. This was done to ensure as nearly as possible an even distribution of heat throughout the whole specimen.

Three and five hours were chosen for the times of heating the large specimens, and two and three hours for the 4in. cubes. It was estimated that the internal temperature of the small specimens in that time would be about the same as that of the large specimens exposed the longer time. These time periods include that required for the furnace to reach 1,500° Fahr. After heating, the specimens were removed from the furnace and allowed to cool slowly in air.

The temperatures were measured

by a carefully standardised Le Chatelier pyrometer, readings being taken simultaneously every ten minutes upon the thermocouple placed between the specimens, which registered the temperature of the furnace, and upon those embedded in the specimens, which gave the corresponding internal temperatures at the points taken.

The specimens used to measure the conductivity by heating upon one side only were placed in the doorway of the furnace with the exposed face on a line with the furnace wall. These specimens completely filled the doorway with the exception of an inch at the top which was filled with magnesite board. Fig. 1 shows the arrangement of large specimens in the furnace and in doorway.

Specimens designed for strength tests were faced with plaster of Paris.

A few tests were made upon some specimens left over from last year's experiments, and two or three upon some samples of 1-2-3 trap rock mixtures two years old.

Classification of Specimens.

Lot A	1-2-4 mixture, limestone,	age 2 months.
Lot B	1-2-4 mixture, trap rock,	age 2 months
Lot C	1-2-4 mixture, cinder,	age 2 months.
Lot D	1-2-4 mixture gravel,	age 2 months.
Lot E	1-2-4 mixture, limestone,	age 1 year.
Lot F	1-2-4 mixture, trap trap,	age 1 year.
Lot H	1-2-4 mixture, trap rock,	age 1 year.
Lot K	1-2-3 mixture, trap rock,	age 2 years.

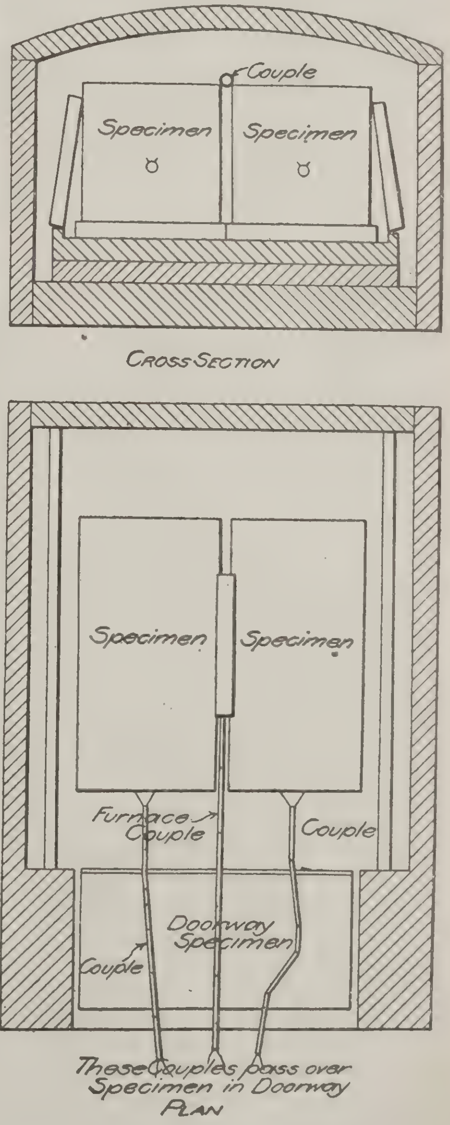

FIG. 1. LARGE SPECIMENS IN FURNACE AND IN DOORWAY.

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* A paper read before the American Society for Testing Materials.

† "The Effect of Heat upon the Crushing Strength and Elastic Properties of Concrete," published in the "Fire Supplement" to our issue for June 6th last.—Ed. B. J.

Conductivity Tests.

Most of the specimens used in this investigation were 7-in. cubes, this being as large as the furnace would take. A few were 6-in. by 6-in. by 14-in. prisms. When these specimens were made, thermocouples were cast in them at varying distances from the surface, the idea being that when these were tested in the furnace and the temperature readings taken simultaneously upon the furnace atmosphere, and the couples embedded at varying depths in the concrete, the rate of transmission of heat through the concrete would be obtained. The work was carefully done, but results were confusing, and subsequeut breaking of the specimens showed that the couples had been shifted by tamping the concrete when the specimens were made. In some cases they were an inch out of place and this completely nullified the work in regard to obtaining a rate of transmission from these specimens. Figs. 3 to 6 are the curves plotted from these tests for a period of five hours in each instance. One curve gives the temperature of the furnace, which was brought up to 1,500° Fahr. in less than an hour and held there for the balance of the test, and the other curves show the corresponding temperatures on the interior of the specimens. Although the depths given to the couples are not entirely reliable, for reasons already explained, nevertheless the curves are very interesting in showing the general lag in the rise of temperature in the specimen as compared with the furnace temperature.

The gravel specimens
were the only ones which attained an interior temperature equal to the furnace temperature.

It is rather surprising to note that
cinder came next to the gravel
in the amount of interior heat recorded, for cinder concrete is well known to be an effective fire resistant. However, the cinder concrete specimen, tested in the furnace doorway, gave the lowest interior heat. It was found impossible with the small furnace employed to maintain an even distribution of heat, and undoubtedly some of the conflicting testimony of the tests was attributable to this cause.

The curves in Fig. 6 are from tests of specimens one and two years old, and although the furnace worked badly, thus giving a very slow temperature rise, there is no evidence that either specimen possessed heat-resisting qualities superior to those of the new concretes.

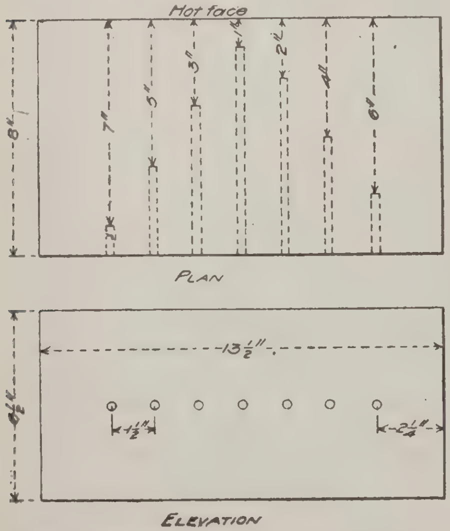

FIG. 7.—ARRANGEMENT OF HOLES FOR THERMO-COUPLES.

Attention is called to one peculiar characteristic in all the curves. This is the flattening out at or a little after 212° Fahr. is past, showing that after steam begins to generate there is little if any rise in temperature until all the water in the concrete has been evaporated. The only curve in which this peculiarity is absent is K1, Fig. 6, and this specimen was two years old; it had been kept in a very dry room for over a year, and probably contained very little moisture. This was the only specimen available at this age, and, unfortunately, it was tested when the furnace worked badly, so the results are not conclusive.

After ascertaining that the locations of the thermocouples in the above-described specimens were not all exact, one special trap rock block was made having seven holes ¼in. in diameter cored in as shown in Fig. 7. The bottoms of the holes were arranged from 1in. to 7ins. from the face to be exposed to heat, and the holes were spaced 1½in. apart. Thermocouples were sealed in these holes and all connected through a switchboard to the same galvanometer. The position of these thermocouples was absolutely assured.

This specimen was placed in the furnace doorway and subjected to 1500° Fahr. on one face for five hours (see Fig. 8). Readings were taken every ten minutes on each thermocouple, and the results are shown in the plotted temperature curves in Fig. 9. These curves are very instructive, although there is some interference. The first salient characteristic of them all is the lag at the 212° point. It will be noted that this is greater with increased thickness of the concrete; also that up to 3-in. thickness the recorded temperature at which it occurs is above 212°, showing that the surface of the concrete heated very rapidly and went above the boiling point of water. It is undoubtedly these conditions which cause steam to generate enough to become explosive and burst off patches of concrete, which is a common occurrence in fire tests.

The curves for the points 1in. and 2ins. from the heated face are nearly the same. The indications are that they would have been run together had the test continued longer. The reason for this is not apparent,

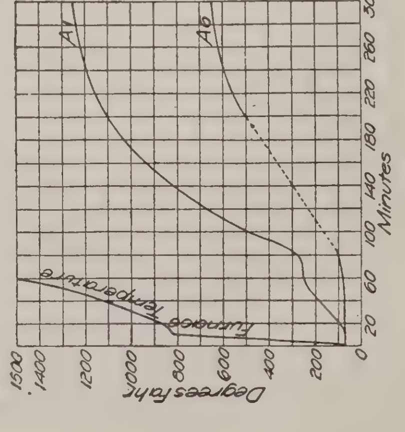

FIG. 2.

Limestone, 2 months old.
A-1. Specimen in furnace, temperature measured 3ins. from face.
A-6. Specimen in doorway, temperature measured 4·5ins. from face.

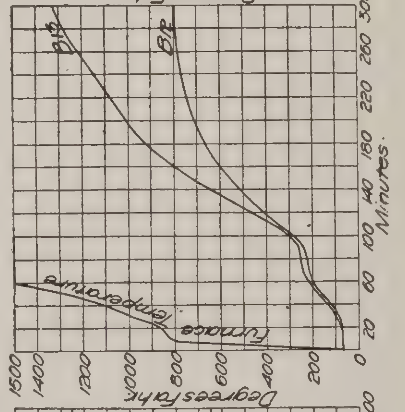

FIG. 3.

Trap Rock, 2 months old.
B-13. Specimen in furnace, temperature measured 1in. from face.
B-12. Specimen in doorway, temperature measured 1·5in. from face.

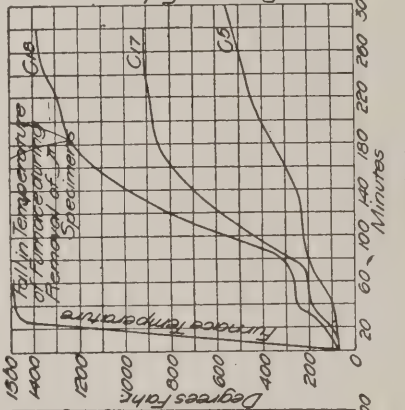

FIG. 4.

Cinder, 2 months old.
C-18. Specimen in furnace, temperature measured 2ins. from face.
C-17. Specimen in furnace, temperature measured 3ins. from face.
C-5. Specimen in doorway, temperature measured 1·5in. from face.

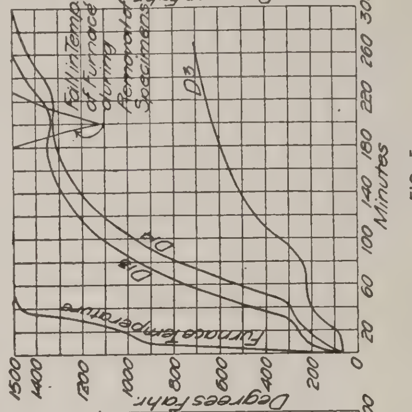

FIG. 5.

Gravel, 2 months old.
D-13. Specimen in furnace, temperature measured 2ins. from face.
D-14. Specimen in furnace, temperature measured 3ins. from face.
D-3. Specimen in doorway, temperature measured · 4·5ins. from face.

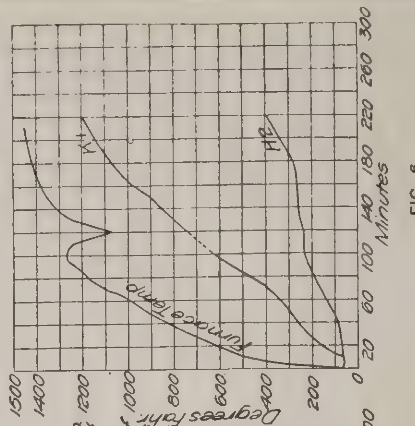

FIG. 6.

Trap Rock, 2 years old.
K-1. Specimen in furnace, temperature measured 1·5in. from face.
K-2. Specimen in doorway, temperature measured 4·5ins. from face.

TEMPERATURE RISE AT DIFFERENT POINTS IN LIMESTONE, TRAP, CINDER AND GRAVEL CONCRETES, ALL 1 : 2 : 4 MIXTURES.

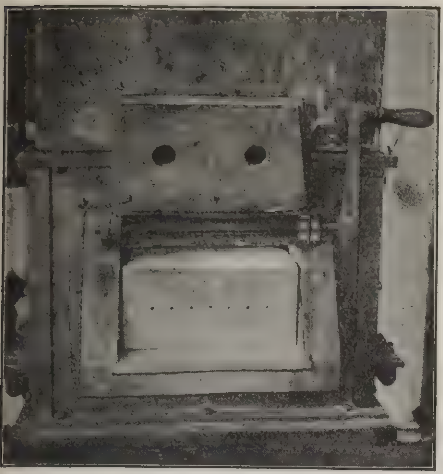

FIG. 8. SPECIMEN IN FURNACE FOR HEATING ON ONE SIDE.

but it may have been due to an accidental arrangement of the stone in the concrete in such a way as to form a comparatively solid stone connection between the thermocouples, which by its better conducting qualities tended to equalise the temperature between the points.

Considering these two curves as one, there is a marked parallelism between it and the curves embedded 3, 4 and 5 ins. in the concrete, and the distance between them is very constant. The curves for 6 and 7-in. points are irregular, although No. 7 is nearly parallel with the others. No. 6 is particularly freakish. The reason for this is plain. Points No. 6 and 7 were 2¼ins. from the end of the block, and as these ends were more or less heated from the furnace walls, the points in question received some heat from this source as well as the face. This threw their temporary curves out of harmony with the central points, which were not so affected.

As a whole, they are regular and indicate that the heat-resisting quality is **not a direct function of the distance** from the heated surface to interior point at which the temperatures were measured. It will be noted that the curves flatten out and that doubling the distance more than doubled the time required to secure the same temperature rise.

These curves as well as those of Figs. 2 to 6 show conclusively that the very low thermal conductivity of concrete indicated by the single test reported in our paper of last year was entirely correct. They prove that two or three inches of concrete properly mixed, tamped and set, will resist a fierce conflagration for hours without permitting a serious temperature rise upon the opposite side.

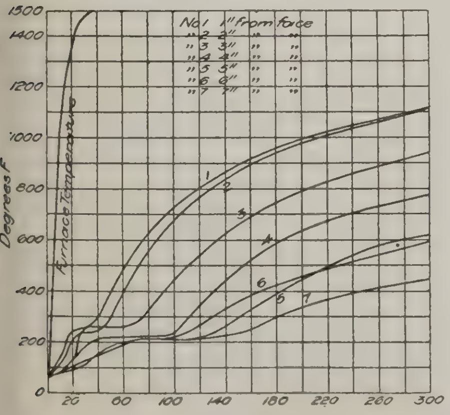

FIG. 9. TEMPERATURE CURVES.

Strength and Elasticity Tests.

Table I. gives the results of tests upon the 4-in. cubes. In the one-year-old specimens (E and F) comparison is given with tests of duplicates made when they were one month old. The increase in strength is not large. Both the limestone and trap specimens made this year are much stronger than those made a year ago. The probable explanation is that the specimens were soaked in water this year for one week on removal from the moulds, and last year were only sprinkled. It is doubtful if they then received sufficient water to produce a perfect set of the cement.

It will be noted that specimens A and B, when heated three hours at 1,500° Fahr., were stronger than those heated two hours. This is contrary to all our previous experience and must be attributed to one of two causes: either the specimens heated two hours happened to be weak structurally, or the three-hour specimens were protected in some way in the furnace and did not get the heat credited to them. In any event the results are anomalous and should be rejected.

TABLE I.

CRUSHING STRENGTH OF CONCRETE BEFORE AND AFTER HEATING.

Lot	Material.	Not Heated.	Same lot in 1905 when 1 mo. old.	After heating 2 hrs. at 1,500° F.	After heating 3 hrs. at 1,500° F.	After heating 5 hrs. at 1,500° F.
		Breaking Loads, Lb. Per Sq. In.				
		4 × 4 × 4-in. specimens.				
A	Limestone ...	3,030	—	980	1,445	
B	Trap Rock ...	3,195	—	1,300	1,410	
C	Cinder... ...	1,360	—	750	447	
D	Gravel ...	2,740				
E	Limestone 1 year old ...	1,741	1,968	1,235	937	
		2,165	1,843	1,110	906	
			1,640	1,200		
				1,290		
F	Trap Rock, 1 year old ...	2,230	1,903	1,525	665	
		2,800	1,913	—	695	
		2,240	1,982	—	—	4 hrs,
K	6-in. cube limestone 2 yrs. old	2,290	—	—	—	2,005
		6 × 6 × 14-in. specimens.				
A	... ...	2,740	—	—	1,345	870
B	... ...	3,140	—	—	1,400	997
C	... ...	1,400	—	—	547	504
D	... ...	2,780				

NOTE.—Where more than one breaking load is given it indicates that several specimens were tested.

No strength tests were made upon heated gravel specimens because they all either fell in pieces upon removal from the furnace or were so badly cracked as to prohibit testing them.

Table II. gives the modulus of elasticity (E) calculated on increasing loads for specimens that had been heated for different times. Usually the moduli of unheated specimens decrease with increase of load, but it is not infrequent that they reverse the rule: the exception is in evidence in this series.

The moduli of the heated specimens are very low in value, but in all cases the value increases with increase of load. This peculiarity was referred to last year. The reason is not clear, but perhaps it is because the specimen expanded on heating, and, when cooling, the outside contracts more rapidly, thus developing many fine cracks which do not entirely close when normal temperature is reached. The first loads applied to the specimen serve merely to close these cracks, and the compression observed is not, therefore, the true deformation of the concrete for these pressures. The value of the moduli decreases very rapidly with increase of heat treatment. This fact was also brought out last year; the present figures are merely confirmatory.

The limestone lost about 50 per cent. of its strength when heated 2 hours, and the trap about 55 per cent. The difference was undoubtedly accidental, for we well know that trap is superior to limestone in resisting heat. They both lost 68 per cent. of their strength in 5 hours, when heated on all sides with no radiation permissible.

Effect of Heating on One Face.

The strength of the 6-in. by 6-in. by 14-in. specimens heated on one face (see Table III.) is in marked contrast to those heated on all sides, and shows that under that condition the concrete retains a large part of its strength even after five hours of exposure to a temperature of 1,500° Fahr. As a matter of fact the specimens tested in this manner really received considerable heat upon four other faces, for it was impossible to protect them from the radiant heat from the furnace walls, so they were probably heated more thoroughly than they would have been had they formed a part of a concrete wall facing the fire.

The great feature of the elastic curves obtained from the 6-in. by 6-in. by 14-in.

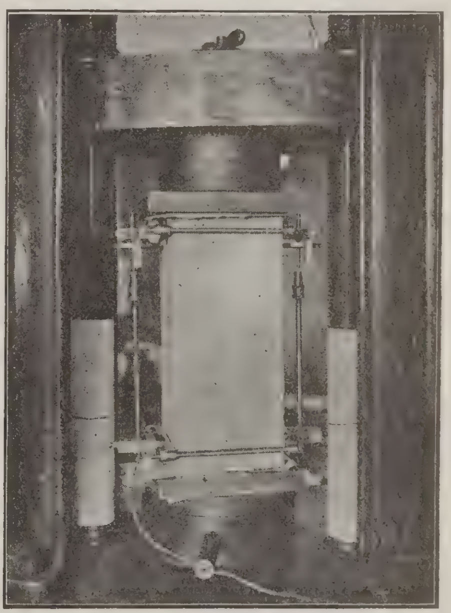

FIG. 10. SPECIMEN READY FOR ELASTIC TEST

TABLE II.

ELASTIC PROPERTIES OF 6IN. by 6IN. BY 14IN. PRISMS.

Lot	Material	E at 200 lb. per sq. in.			E at 400 lb. per sq. in.			E at 800 lb. per sq. in.	
		Unheated —	Heated 3 hrs.	Heated 5 hrs.	Unheated —	Heated 2 hrs.	Heated 5 hrs.	Unheated —	Heated 3 hrs.
A	Limestone	6,000,000	200,000	....	6,000,000	285,000	....	5,647,000	425,000
B	Trap Rock.........	3,430,000	150,000	129,000	4,355,000	222,000	188,000	4,355,000	348,000
C	Cinder...............	1,090,000	49,500	57,100	960,000	....	....	915,000	....
D	Gravel	8,000,000	....	....	6,887,000	....	....	6,000,000	....

Blank spaces indicate that specimens had failed by fire or crushing.

TABLE III.

ELASTIC PROPERTIES OF 6IN. BY 6IN. BY 14IN. PRISMS HEATED ON ONE FACE ONLY.

Lot	Material	Modulus of Rupture (E) after heating 5 hrs. At 200 lb. per sq. in.	At 400 lb. per sq. in.	At 100 lb. per sq. in.	Breaking Load. Lb. per sq. in.
A	Limestone	293,400	521,700	730,700	1,840
B	Trap Rock	200,000	268,000	379,000	1,705

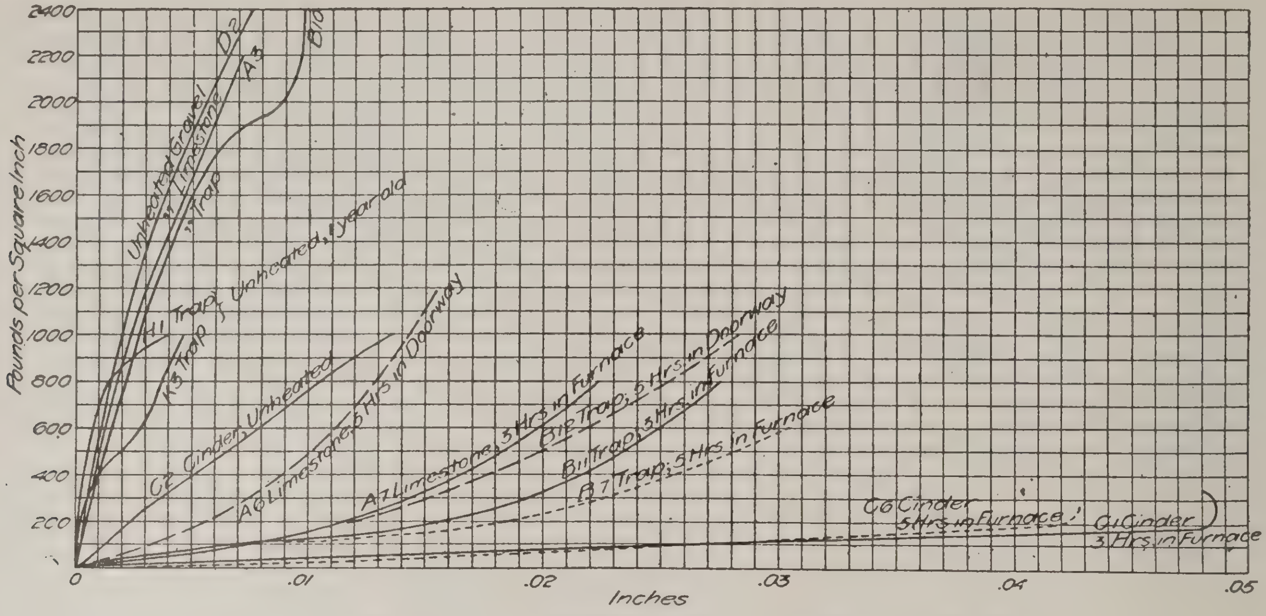

FIG. 11. CURVES OF ELASTIC COMPRESSION GROUPED ACCORDING TO TREATMENT.

specimens both before and after heat treatment is the great increase in deformation with loss of strength due to heat treatment. Fig. 10 shows the method of measuring the deformations. The elastic curves of the specimens, which were one and two years old respectively, do not, apparently, show any material increase in their fire-resisting qualities, although these specimens were heated only 4 hours. Fig. 11 gives the true elastic curves, grouped according to treatment, without regard to the total deflections from which they were derived.

Fire Resistance Affected by Treatment During Period of Getting.

The marked difference in the strength of the specimens made last year and this year, in which the same stone was used, and presumably an equal quality of cement, show that the treatment during the period of setting has much to do with the quality of the concrete. It would be interesting to ascertain if the fire-resisting properties are influenced by the amount of moisture absorbed by the concrete while setting is taking place.

It is fully recognised that definite conclusions cannot be drawn from tests so incomplete as these; but they serve to point the way, and it is hoped that more elaborate experiments may be made which will furnish the additional evidence necessary.

The London County Council and its District Surveyors.—The London County Council is taking legal opinion on the question whether it is liable to pay fees to the district surveyors under the London Building Act, 1894, for surveying buildings owned by the Council. The Government auditor, Mr. Barclay Cockerton, expresses the belief that all such buildings are exempt.

Messrs. Stidder & Co., consulting sanitary and general engineers, of 16, Percy Street, Tottenham Court Road, W., have been appointed sole agents for London and district for the following firms:—Messrs. Joseph King & Co., Terra Cotta Brick and Tile Works, Stourbridge; Messrs. King Brothers, Stourbridge British Fireclay and Brick Works; The Art Tile Co., Stourbridge; The British Sanitary Co. (earth-closets); The Bonnybridge Silica and Fireclay Co., Ltd.; The Dewsbury Electric Manufacturing Co., Ltd. (motors, cranes, etc.).

THE LONDON COUNTY COUNCIL'S FIRE REQUIREMENTS.

With some Notes on Fire-resisting Construction.*

By Percival M. Fraser.

Materials with regard to their Fire-resisting Qualities.

Well-burnt clay bricks are the most reliable building material. Lime mortar is to be preferred to cement. Fireclay is, of course, best, but is not so strong.

Terra-cotta in its porous form is highly satisfactory. There are several other descriptions of terra-cotta which are all more or less useless as a fire-resisting material.

Plaster made with plaster of Paris is a tolerable heat resistant, as it stands drenching at a white heat; it is improved by the addition of asbestos or pumice stone.

Concrete in slabs, of which the aggregate is pumice stone, is classed with the "full resistance" materials.

Reinforced concrete is an excellent fire resistant, provided the reinforcement is 2ins. from the surface.

The following compositions of concrete are given as being highly serviceable. The effects of severe tests with fire and water are also briefly given. The following proportions are mixed with one part of ferro-concrete cement, the sand being sharp pit sand:—

1. Slag 3, sand 2.—Slight cracks and deflection.
2. Broken granite 3, sand 2.— Ditto.
3. Broken granite 3, sand 2.— Ditto and washed off slightly.
4. Burnt ballast 5.—Washed off badly.
5. Coke-breeze 5.—Washed of slightly
6. Furnace clinkers 3, sand 2.—Slight cracks and deflection.
7. River ballast 3, sand 2.—This is wholly bad.

Sandstones are better than limestones and granites, but all are unreliable.

Iron and steel unprotected are unfit for use for constructional purposes. Iron expands about 1½ins. in 10ft. under prolonged heat.

Silicate cotton, slag wool or asbestos are useful materials, as they are quite incombustible, and may be procured in slabs and sheets, or in the form of cloth.

Timber in baulk is perhaps as good a fire resister as can be obtained, as after it is once charred it burns very slowly, and retains its strength when suddenly drenched. Its life is greatly increased by being coated with plaster or tin. The so-called fire-proof paints are of very little practical value.

The possibility of ingition of timber may be decreased by the use of tungstate of soda, silicate of soda and limewash, and asbestos paint. These, however, merely resist ignition, and cannot be considered to resist fire. Treated woods become hydroscopic and brittle, they also discolour and are hard to work.

Floors are of many descriptions.

Arched floors are strong, but heavy and expensive.

Various forms of hollow tubes and slabs of terra-cotta and asbestos, &c. These are all cheap, light and serviceable.

Concrete reinforced with steel rods makes an excellent floor.

Pavings may be of cement, asphalt, metallic paving, wood blocks and wood boards laid directly on to the concrete; these should be tarred on the underside.

Cork carpet on concrete makes a very good floor.

A tongued wood floor of ordinary construction with plastered ceiling will stand an ordinary conflagration for about an hour.

Flats are constructed similarly to floors, but are lighter and are best asphalted; Vulcanite and wood cement are largely used.

Partitions.

Ordinary lath and plaster partitions, when the intervening spaces are filled in with slag wool, are rendered fire-resisting and sound proof.

Other light partitions are formed in concrete, brick on edge, terra-cotta, asbestos, and other slabs, Uralite, expanded metal and plaster, or fine coke-breeze concrete, all of which may be fixed on a steel or wood framework.

An air space in the thickness of a partition is a great advantage.

Continuous sheets of metal when used for reinforcement are bad, as they tend to buckle under heat.

Staircases.

Baulk timber is the best material for steps. Other steps are constructed of reinforced or ordinary concrete, stone and built-up hardwood.

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* A paper read at the meeting of the Institute of Sanitary Engineers held at Manchester on July 6.

Doors.

Iron doors, as stated before, are required by the Council, but unless secured all round the edges are practically useless. Sliding doors are best, as they can be held on at least three sides.

Armoured sliding doors are perhaps the best for use in party walls between large buildings. These are made up with wood and Uralite, or sheet tin, and can be arranged by means of inclined runners so that when a certain temperature is reached the door fastenings give way and the door is allowed to close automatically by gravitation. I have always used this description of door as made by Messrs. Mather & Platt and always find them to be serviceable for general use.

Glazing.

This has already been described under Factory Buildings. Opinions differ as to whether roof glazing over staircases, well holes, &c., should be fire resisting, or whether it should be constructed so as to break in case of fire and carry away smoke and flames. I think this is a bad principle, as every time a staircase door is opened huge volumes of smoke are drawn in and thus render the staircase impassable. The use of shutters is not advisable.

Miscellaneous.

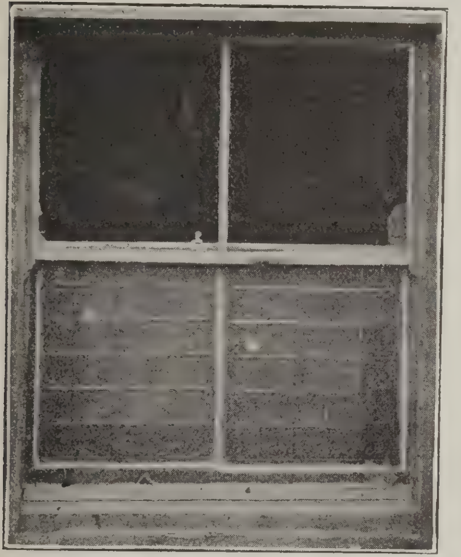
Simple precautions against the spread of fire should be employed in every class of building, such as floor pugging and treating woodwork with solutions and the use of steel roofs and concrete stairs with wood casing.

Automatic sprinklers which act at a temperature of 150 to 200 degrees are useful for checking a fire in its infancy, but are open to objection.

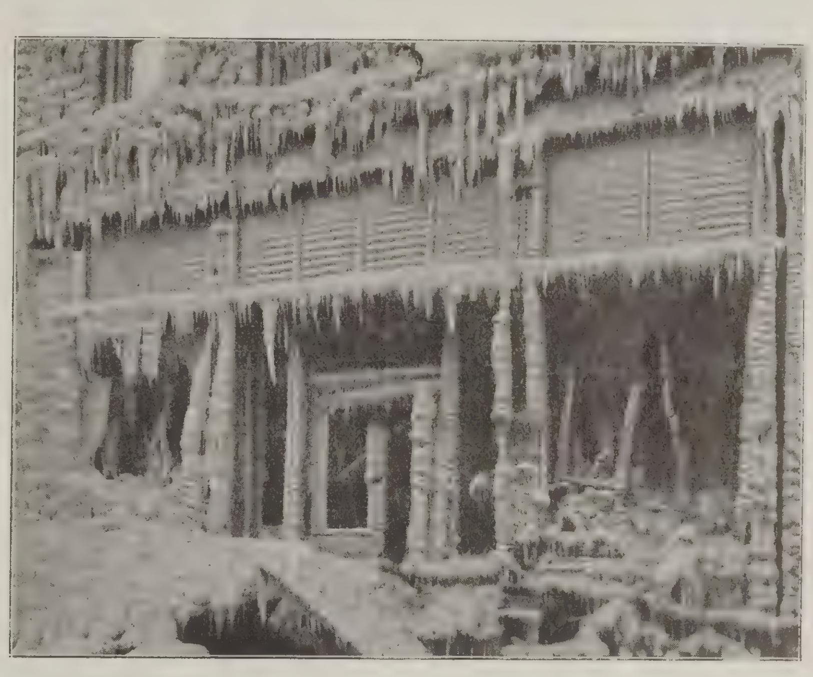
Automatic fire alarms are useful, but require constant attention.

GLASS AND FIRE.

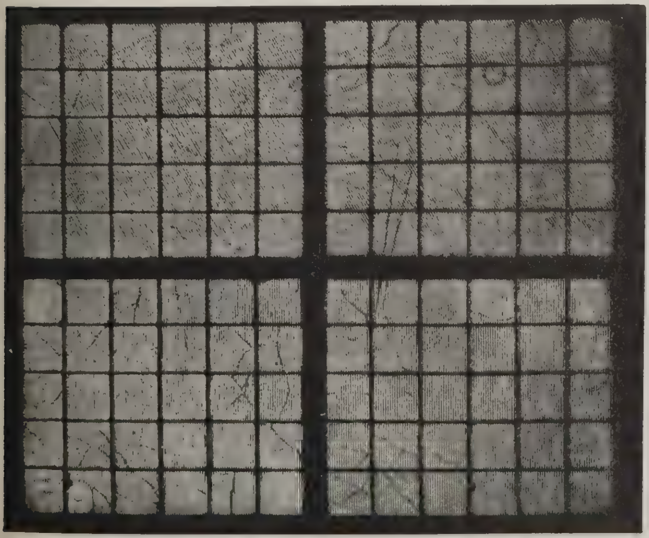
A good deal of attention has been paid to the fire resistance of floors, walls and roofs, but insufficient attention has been given to the protection of vertical openings. In order to stop the spread of fire there is something more necessary than heavy brick walls, for walls are almost never unbroken. They are cut up by windows, by light wells and areas of various widths, and it is through these openings that fires spread. Not only does this happen in the case of light wells, light courts and areas, but even across wide streets, as, for instance, in the Barbican fire, the Baltimore fire, and the San Francisco fire. A good many tests have been carried out to determine the resistance of special forms of glazing under fire, but it is interesting to observe the results in actual fires. We publish herewith three views showing examples of Luxfer electro-glazing that have successfully passed through actual fires. The view of the McClurg Book Store in Chicago is a striking one. It will be seen that electro-glazed Luxfer prisms still remain in position. The hanging icicles that have resulted from the playing-on of the water in severely frosty weather give a weird effect. The Luxfer plate in the Barbican fire in April, 1902, and the electro-glazed plate from a fire at 58, Coleman Street, London, show that the glass, though cracked, still remained in position.



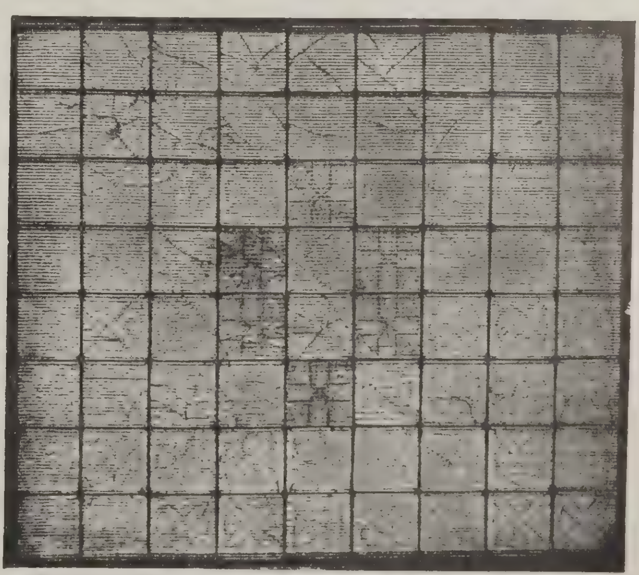
WINDOW AT 62-64, WELLS STREET, HACKNEY.
AFTER THE FIRE ON APRIL 12, 1906.



SOUTH ENTRANCE OF A. C. McCLURG & CO.'S BOOK STORE, CHICAGO,
AFTER FIRE.



ELECTRO-GLAZED PLATE FROM A FIRE AT
58, COLEMAN STREET, LONDON.



LUXFER PLATE FROM THE BARBICAN FIRE
IN APRIL, 1902

FLAME-PROOF WOOD.*

The Views of Professor Vivian B. Lewes.

Although timber, like all organic substances, is combustible and will undergo destructive distillation when exposed to a high temperature, yet it can be treated in such a way as to render it flame-proof, so that the action of intense heat upon it is merely to char it, but not to set it on fire in such a way that it can spread the combustion.

First attempts.

It is now more than three centuries ago since attempts were first made to render timber used for ship-building fire-proof, and from the early years of the 17th century down to the present time countless attempts have been made to protect wood in such a way as to prevent its being combustible. Hardly any of these attempts passed the experimental stage, and chiefly consisted of applying paints made with mineral matter, like silicates, for coating the surface of the wood, and also many strange solutions for soaking it in before use, but all these attempts, as far as fire-proofing is concerned, ended in failure. It became evident that unless the protecting ingredient could be got into the structure of the wood so as to permeate it to the core, and so make it part of the wood itself, a successful and satisfactory result was not possible of attainment.

Sir Humphrey Davy and Faraday.

In the last century Sir Humphrey Davy and Faraday both attempted to solve the problem, and since then many scientific men have devoted considerable time and attention to it, but although it was easy enough as a laboratory experiment to render a splint of wood non-flammable, directly it was attempted on a commercially practical scale, abject failure was the only result.

The cause of these failures is not far to seek. Impregnation of a most thorough character is an absolute necessity, but every kind of wood has to be treated in a different way in order to meet the requirements of the varying densities, and as this depends not only upon the kind of wood, but also on the age of the timber and the character of the soil on which it grew, not only did the process have to be varied with different specimens of timber, but also for different samples of the same timber when grown under different conditions, these being points which only now have been recognised.

Substances used for Fire-proofing.

A wide variety of substances has been suggested for fire-proofing, and the salts employed are now generally spoken of as "anti-pyrenes," but many of these have now been found to be absolutely unsuitable, owing either to their action upon the wood itself or upon the materials which had to be used with it. One of the most popular substances in the early experiments was common salt, but it was soon found that timber impregnated with it could not be commercially used because of its hygroscopic properties. Other substances then employed to effect the fire-proofing were found to rot the wood, whilst some very rapidly corroded the nails and screws used with the impregnated timber. Other chemicals again, although they might do the required work for a short space of time, volatilised and left the timber as inflammable as it was before.

Compounds in use.

Practical experience has narrowed the list of efficacious compounds to—

Ammonium chloride.
,, phosphate.
,, sulphate.
Calcium chloride.
Magnesium chloride.
Zinc chloride.

Zinc sulphate.
Stannous chloride.
Alum.
Borax.
Boracic acid.
Aluminium hydrate.

How the Timber is Treated.

In making the non-flammable wood the timber is run on small trolleys into large cylinders, in which, by means of a vacuum, all air and moisture are extracted from the cells of the wood, and the solution of the chemicals is then run in. The contents of the cylinder are placed under hydraulic pressure, carefully regulated according to the character of the wood, a pressure which is needed by one kind of wood crushing and destroying the cells of another. Indeed, the success of the whole process depends upon minutiæ of this kind, and the placing on the market of improperly treated wood has created a prejudice against such processes that has done much to retard its introduction.

After Impregnation.

After impregnating, the completion of which is indicated by the gauge glass on the cylinder showing that the right proportion of the liquid has been absorbed, the wood is removed, drained, and dried at a carefully regulated temperature, this again having a great influence on the quality of the finished wood, temperatures above 85° F. tending to render many kinds of wood brittle, whilst when dried at the right temperature the wood not only retains all the qualities of the original wood, with the exception of inflammability, but is thoroughly seasoned and ready for the joiners' shop.

Made in this way non-flammable wood is a perfect building material, has no effect upon the workmen's tools, as was the case when the earlier antipyrenes were used, and will take paint, stains, varnish, or other decorative treatment as well as it did before fire-proofing, but now combines the dual advantages of excessively low conductivity with a great power of resisting fire, and entire freedom from spreading fire.

The Cellulose.

As before pointed out, the cellulose of the wood is still there, and whilst a fierce flame is playing upon it this compound is carbonised, inflammable gases being generated and burning with small jets of flame, but the moment the heating flame is removed the charred mass blackens, and no spreading of the fire takes place.

This effect is caused by the chemicals used, consisting chiefly of ammonium phosphate and boracic acid, which during treatment crystallise in the cells of the wood, and can therefore never be removed. Under the influence of heat the ammonium phosphate decomposes to ammonia gas and phosphoric acid, the former driving all air out of the cells and replacing it by a non-flammable gas, whilst the phosphoric and boracic acids exude and coat the cell walls with a glaze, which, while allowing the gases from the decomposing cellulose to escape, prevents the access of oxygen from the air to carry on further combustion.

Where its use should be enforced.

Even should the apathy of the public, and the greed of the speculative builder combine to prevent wood so prepared having the universal adoption it deserves, its use should be enforced in all new hotels, public buildings and places of entertainment, where it would afford more protection in case of fire than the multiplication of exits can ever do.

It is far easier, moreover, to treat fabrics than wood, as the cotton, consisting of minute tubes, will easily suck in and absorb a solution of the antipyrenes, when merely soaked in it, without the paraphernalia of vacuum cylinder and hydraulic pressure pump, and when properly prepared will take the colours as well as the original canvas. With scenery so prepared and fire-proof battens and slate, no fire to cause danger could take place.

Decay and Rot Prevented.

The salts present in the wood prevent decay and dry rot, whilst the important advantage in its use is that its presence prevents the formation of pyrophoric char on wood exposed for long periods to the action of hot water pipes, flues, &c.

The coming of the motor car and the motor boat, and the rapid spread of electric traction has created a new class of fire risk, unfortunately more dangerous to life than to property.

The current necessary to drive an electric train is amply powerful to work an electric furnace, and when owing to a faulty splice in the connecting wires on the cars, or other fault, a short circuit is produced, any inflammable substance exposed to the enormous temperature of the arc is at once set in a blaze, and the iron tube enclosing the wires is no more protection than a cardboard one would be, as the metal is melted away at once.

For the Protection of Trains.

Now, a train on fire at any time is unpleasant, but when the fire takes place in an underground tunnel, where if you escape the flames you are suffocated by fumes and smoke, it is too awful to contemplate. The dreadful disasters which have taken place in Paris and Liverpool, and which have only been narrowly avoided in London on more than one occasion, should make the public for their own safety insist on a guarantee that the cars have been built of non-flammable wood, before using the line. The District Railway has taken the precaution to do this, but how many non-flammable trains are running on other lines I am not in a position to say.

In the petrol motor-omnibus also the ignition of the petrol might lead to most disastrous results where the car was built of inflammable material, and nothing but non-flammable wood should be used for this purpose, whilst for motor-boats, in the Navy, and for the woodwork of passenger and cargo steamers it would be of the greatest value.

Cost.

In all cases, however, it is the question of cost which militates against the introduction of improvements of the most valuable kind, and with non-flammable wood the matter at first sight seems very serious. To properly impregnate the wood something like 4lbs. of expensive chemicals have to be used per cubic foot, this, however, not increasing the weight of the finished wood, as it is more than made up for by the moisture withdrawn, and the result is that with cheap timber, such as the deals used for ordinary building purposes, the protection may cost as much as the wood, and if you are going to look upon it as doubling the cost of the material I admit the chance of getting builders to adopt it is small. I venture to submit, however, that this would be an entirely erroneous method of considering the question, and that the true way is to take the extra cost on the finished building or structure.

---

* Part of a paper read by Prof. Lewes, of the Royal Naval College, Greenwich, before the Society of Arts.

An Insurance.

In any house, carriage or car the amount of wood present is sufficient to ensure the total loss of the whole structure should the wood burn away. Now, if you are building a car which will cost £1,000 if built with inflammable, and £1,100 if built with non-flammable wood, I think there are few persons who would not prefer to spend the additional 10 per cent. for the certainty that it would save them the cost of the car if the petrol caught fire.

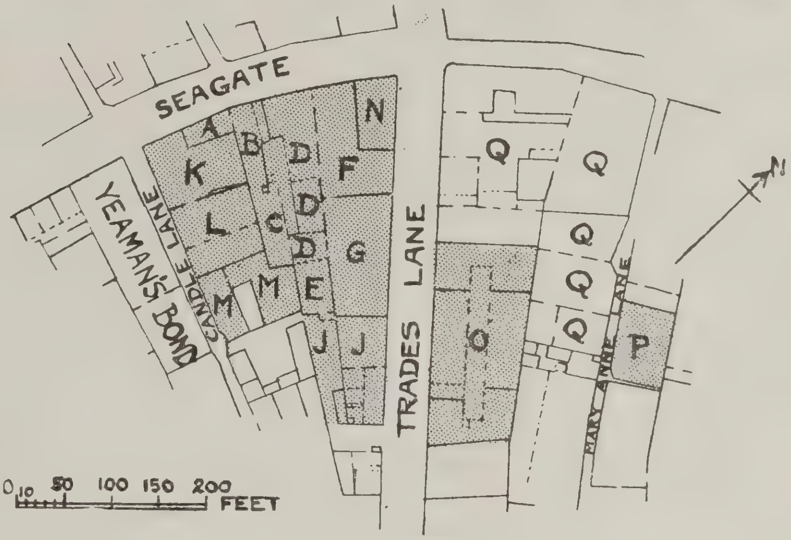
Looked at from this point of view I think it will be admitted that in all large buildings the increase on the gross cost would be so small as to make it almost a duty to adopt a measure that is not only for one's own safety but for the good of the community at large.

A DUNDEE FIRE.

The big fire at Dundee on July 19th had several interesting features constructionally. The area of the fire is shown on the plan reproduced. The fire originated in the roof or in the top floor of the bonded warehouse marked **F** on the plan, belonging to Messrs. James Watson & Co., Ltd., whisky merchants and distillers. The bonds contained what is known as the liquor which had not come under the purview of His Majesty's officers for the payment of duty. From cellar to roof it is calculated that in all between 40,000 and 50,000 casks were stored—equal to about a million gallons of spirit. The burning spirit spread in all directions, and not only freely passed the double iron doors which shut the openings between the various parts of the premises lettered **C, D, D.D, F & G** on our plan, but also found its way through the solid walls between Messrs. Watson's premises and those of Messrs. John Robertson & Son, Ltd., whose bonds were also well stocked.

Ultimately both Watson's and Robertson's premises were reduced to ruins, together with the buildings in the immediate area involved occupied by the Scottish

VIEW OF THE DUNDEE FIRE FROM CORNER OF TRADES LANE AND SEAGATE.



PLAN OF THE DUNDEE FIRE.

James Watson & Co., Ltd.—**A.** Offices and Caretaker's Dwelling, 4 floors; **B.** Offices and Wine Stores 3 and 4 floors and basement; **C.** Wine Cellars and Warehouse, 4 floors and basement; **D.D.D.** Warehouses, 4 floors and basement; **E.** Cask Store and Cooperage, 1 floor and basement; **F.** Warehouse, 6 floors and basement; **G.** Warehouse, 6 floors and basement; **J.J.** Cooperage, 1 storey.
John Robertson & Son, Ltd.—**K.** Bonded Warehouse. 4 and 5 floors; **L.** Bonded Warehouse, 3, 4, and 5 floors and basement.
Stewart Robertson.—**M.M.** Sanitary Engineer's Store, 1 and 2 floors.
Scottish Co-operative Wholesale Society, Ltd.—**N.** Grocery Stores, 2 floors, attic and basement.
T. S. Ross & Co.—**O.** Jute Warehouse, 2 floors.
John Henderson & Co.—**P.** Jute Warehouse, 1 storey.
Trades Lane Calendering Co., Ltd.—**Q.Q.Q.Q.Q.** Warehouses, 1, 2, and 3 floors and attics.

THE DUNDEE FIRE: VIEW OF ROBERTSON'S BOND.

Co-operative Wholesale Society, Ltd., as a provision warehouse, and Mr. Stewart Robertson, as a store for fire-clay goods, &c. Messrs. T. S. Ross & Co.'s jute warewarehouses on the east side of Trades Lane were gutted, the roofs having been ignited independently of each other by falling embers. Yeaman's Bond No. 2 on the west, and Trades Lane Calendering Co. on the east, were only saved by the heroic exertions of the brigades and of the Calendar employees, but they were seriously damaged by fire and water. Later, Messrs. John Henderson & Co.'s jute warehouse in Mary Anne Lane was similarly gutted. Fortunately the wind held from the north-west, which aided the brigades in saving the buildings fronting the north side of Seagate, and they escaped with comparatively little damage.

On Friday the walls of the jute warehouses in Trades Lane developed an outward bulge, which hour by hour perceptibly increased. The massive stonework, however, resisted the pressure of the sodden and expanding jute, and by Sunday, such was the strain on the foundations, that the pavement was torn up, the heavy slab being contorted into all sorts of fantastic shapes. It was not till 12.15 on Tuesday morning that the masonry gave way, the débris blocking the street and penetrating the wall of the cooperage opposite. During the forenoon the workmen successfully demolished the north gable, with the collapse of which the arch also yielded. The total loss to the fire offices is estimated at £463,000, divided between 26 companies, the nett losses running from £2,500 to £15,000.

This is the third great whisky fire in Scotland within three years. In June, 1903, the Ardgowan Distillery, Greenock, was entirely destroyed, making a loss of about £60,000; and in October, 1904, the North of Scotland Distillery, Aberdeen, was burnt out, the loss being £90,000.

When Messrs. Watson's building was put up efforts were made to construct it with a view of being fire resisting. The date of its erection was 1895, and the building embodies the ideas of that period —*i.e.*, of 10 years ago; in fact, embodies ideas somewhat in advance of that date.

The two lower floors—which were the important floors—were constructed of concrete, supported by iron joists and columns, both joists and columns being well encased with concrete. The upper floors were, however, of poorer design with wide joists.

The nett result of the fire was that the lower floors stood up to the very fierce fire, but the whole of the upper part of the building was gutted.

Perhaps we should add that the floors which have stood up against the fire were constructed by Mr. Boyd Wilson, of Messrs. Watson Bros., Glasgow, under the supervision of Mr. Alexander Johnstone, architect. of Dundee.

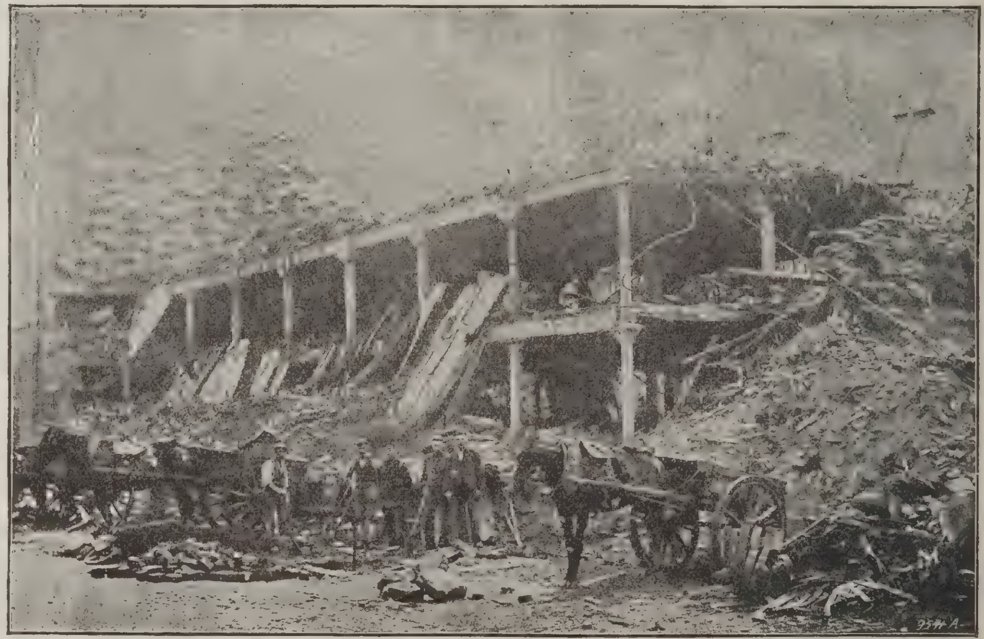
For the two illustrations on this page we are indebted to *Engineering.*

FIRE-RESISTING VILLA RESIDENCES.

Partly with a view to testing the practicability of fire-resisting construction in small houses, and also with a view to solid construction, following the injunctions of John Ruskin in his "Seven Lamps," "I would have, then, our ordinary dwelling-houses built to last," Messrs. S. & A. K. Salisbury, M.M.S.A., have recently completed two fire-resisting residences at Harpenden, Herts, at a cost of just over £1,000 each. The floors in the first are Messrs. Archibald D. Dawnay & Sons' solid tile and concrete, and in the second house Messrs. Hodkin & Jones's corrugated-bar system. In both houses the internal walls are 4½-in. brickwork, and, where partitions are necessary, Hemel Hempstead partition blocks are used, and the stairs are "granolithic" stone. A third house is now being erected with the Kleine patent fire-resisting flooring. It is claimed that the substantial construction, the entire absence of timber built into walls, the freedom from cracked ceilings and springing floors, the consequent longer probable life of the building, affording greater security as an investment, together with the protection from fire, will fully justify the small additional cost involved.

Under Euston Station it is proposed to construct another station for the suggested electric line between the terminus and Watford.

Demolition of Wembley Tower.—The demolition of Sir Edward Watkin's ill-fated copy of the Eiffel Tower at Wembley Park, London, N., has been commenced by a firm of Manchester contractors. The design was chosen from among 50 sent in. It was to excel the Eiffel Tower in height and splendour. As a matter of fact, however, it never attained more than 150ft. out of 1,200ft. The five "footings" are set in 20ft. of concrete, and measure 60ft. by 60ft. each.



THE DUNDEE FIRE: THE TWO FLOORS AT WATSON'S BOND WHICH RESISTED THE FIRE.

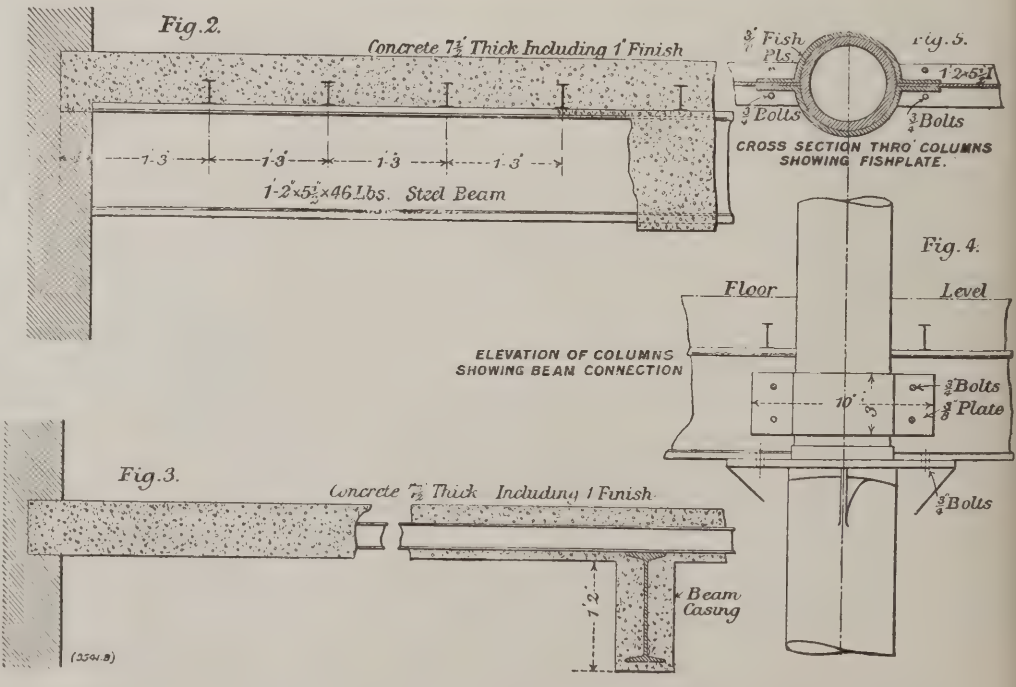


Fig. 2.
Concrete 7½" Thick Including 1" Finish
1-3
1-3
1-3
1-3
1'-2"×5½"×46 Lbs. Steel Beam
¾" Fish Pls.
Fig. 5.
1'2×5½ I
¾ Bolts
¾ Bolts
CROSS SECTION THRO' COLUMNS SHOWING FISHPLATE.
Fig. 4.
Floor
Level
ELEVATION OF COLUMNS SHOWING BEAM CONNECTION
¾" Bolts
⅜" Plate
10"
3
¾" Bolts
Fig. 3.
Concrete 7½ Thick Including 1 Finish
1'2"
Beam Casing
(2541.B)

DETAILS OF THE CONSTRUCTION OF THE FIRE-RESISTING FLOORS AT WATSON'S BOND.

THE BUILDERS' JOURNAL

AND ARCHITECTURAL ENGINEER.

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Changes in the Modern House. THE many changes which have been made in our houses within the last quarter of a century must be regarded with very great satisfaction. The chief alterations have been in the interior, but attention has also been given to the exterior. In the suburbs the pseudo-Gothic, while still revered by speculative builders and incompetent persons calling themselves architects, is no longer the offence which it used to be. Even some of the older and most atrocious examples have been made less formidable, or even unobtrusive, by the mellowing influence of time and a generous growth of creeper, while the newer houses are, many of them, quite admirable in design and clearly the work of architects better trained than the average practitioners of the last century. We make a dead set against the Gothic house building referred to above, not because we have any particular antipathy to Gothic *per se*, but because it is a style demanding a very keen sense of proportion, however much the construction side may be urged. For that reason we have always supported the movement in favour of English Renaissance and Georgian house architecture. We repeat that, although on account of the comparative simplicity of the elevation, the work we now term "Georgian" may not, in some cases, call for a very high standard of ability, nevertheless it has its subtle features, more especially those of proportion, which can only be applied successfully after careful study, while to the accomplished architect it offers innumerable opportunities for quiet treatment and effective design. In reviewing the architectural exhibits at the Academy in recent years we have had again and again to point out the increasing number of houses of this class. Let anybody look at one of Mr. Ernest Newton's houses, and then compare it with some of the Gothic productions to be found enshrubbed round about our towns. Matters architectural have improved since the days when those houses were built. It is true that we still have with us the builder who delights in trefoils and quatrefoils carved at so much a dozen on suburban villas, in company with unwieldy-looking leaves and birds on either side of the doorway, or on keystones over the windows, but even he is fast losing his hold; and although the architect has still to face the many and fearful desires of the client whose knowledge of architecture is probably limited to a cursory reading of "The Stones of Venice," borrowed from the local library, and whose wife (the architect always has to count with her) gauges the merit of a design in proportion to the size of its windows and the projection of its eaves, still, changes are going on in the right direction, and the result is that the houses which we see about us are better in design than the products of a former generation. The interior, too, has been improved, not only in convenience of planning, but also in regard to decoration and furniture. There is no need now to point out what excellent wallpapers can be obtained at reasonable prices, or that the stock-in-trade of a Victorian era is being rapidly cleared out of the modern furniture shop, its place being taken by reproductions of the work of Chippendale, Sheraton, and other masters. Zealous modernists may deplore such harking back, and make a paramount claim for the furniture of to-day being essentially our own. We cannot, however, go with them to such length, for we would rather see our houses filled with reproductions of an earlier English period when taste was inherently good than have rooms made ugly with chairs and tables in all kinds of grotesque shapes, with uncomfortable knobs and corners and sharp angles in the most unsuspected places, as in "L'Art Nouveau"; or the spidery and curly stuff of some French designers, elegant to look upon, but too fragile for everyday use; or, finally, those products worthy of the primitive herdsman which some cranks would foist on us as part of the return to "the simple life."

A Warning. Within the last year or so we have several times noticed heavy girders being taken through London streets on ordinary lorries drawn by two horses. We would draw attention to the danger thus incurred. The carts in question have been built for ordinary merchandise—sacks, boxes, &c.—set down on the body of the vehicle and held in by the sides. Yet enormous girders are put on them, projecting beyond the tail of the cart to within a foot or so of the roadway, and held in place by chains, while the other end stretches over the horses and rests on the front of the cart. One day an accident will happen, the horses will be terribly mutilated and killed, and then there will be an outcry about the criminal negligence of allowing such things to be. They ought not to be allowed, of course. One or two steelwork firms, we observe, have specially constructed wagons for taking these heavy girders through the streets, and the front of these wagons is not of the ordinary wooden construction, but of iron, well-stayed. It would be well if others responsible followed the example.

The Silly Season. AT a time when there is a dearth of matter, when the societies are dozing, and the Law is on its lengthy vacation, it seems rather hard that the technical journalist should be debarred the joys of his confrères of the daily press. Alas, the technical journal has no "silly season." Not in its pages are to be found the engrossing letters from fervent readers which fill so amply the newspaper columns: not for it the discussion of domestic felicities or national foibles. It has, one would think, to be always "au grand sérieux," and the reader is too holiday-demoralised to study the matter before him. Yet, what a world of possibilities lies untouched. Why, indeed, should the technical journal not have its silly season? Are there no momentous questions to discuss? Forsooth, a thousand. "Do bricklayers swear?" "Is the architectural assistant a snob?" "Should we crib?" "Are illicit commissions a failure?" "Do we believe the trade traveller?" "Do clients pay?" What an untouched field, and what a harvest for the technical journalist! The reader would devour this, would wade through columns of debate on the veracity of the trade traveller or the piquant emphasis of the average bricklayer. It might leave him none the wiser, but he would be prepared to read a lot more of it. As it is, much good work goes unread, while the immaculate assistant gives himself over to captious criticism. How are the mighty fallen!

R.I.B.A. EXAMINATIONS.

Model Answers by A. G. Bond, B.A., A.R.I.B.A.

The Final Examination.

Subject I.—DESIGN.

[*Time of examination, eleven hours and a half. Maximum number of marks*, 350.]

1.—*Subject: A farmhouse for a tenant farmer on an open site sloping gently towards the south-west. Requirements.—Ground floor: parlour, front kitchen (or living room), back kitchen (or scullery), larder, dairy, washhouse, fuel-shed, tool-shed, two e.c.'s—one accessible from the back yard, the other from the garden. First floor: four or five bedrooms. Attic: bedroom and a box-room. Basement: cellar optional. (Note.—The possibility of the parlour and a bedroom being let as lodgings during summer-time may be taken into account.) Drawings required:—Three plans (with roof lines dotted on attic plan), two elevations, section—all to be drawn to* $\frac{1}{8}$*th scale: a portion of the front from ground to ridge to be drawn to* ¼*in. scale: perspective sketch.*

NOTE—Probably the majority of the candidates were relieved when they found what subject had been set for design, and it seems certainly less likely to have caused anxiety than some of the subjects set at previous examinations, amongst which may be mentioned the block of flats in 1901 and the district council offices in 1905; though it is true an opportunity to study some of the technicalities is always given beforehand, candidates being advised of the subject a few days before the actual examination. In the present instance there was certainly a freedom from the usual restrictions both as to by-laws and site, but, in designing, this is not always a thing to be wished for. In such a case, therefore, one would be wise to make the most of the three following salient conditions—namely, the aspect and slope of the site, the provision of a dairy, and the possibility of letting-off two of the rooms. In regard to the first of these, it affords an opportunity to make the front rooms loftier than the back portion of the ground floor; the living-room should undoubtedly have a south-east window, and the parlour might well be at the west corner of the building, leaving a north-west external wall which would tend to keep it cool in the summer, when it would evidently be most in requisition. In regard to the second point, the dairy must of course be arranged with a north light, and the other walls might with advantage be built hollow; it must also be kept well away from the e.c's., washhouse and kitchen. As to the third condition mentioned, perhaps the best provisions to make for this separation are (1) a back staircase (one opening direct from the living-room would do), and (2) the arrangement of the "letting" bedroom in such a way that it should be the one most accessible from the main staircase, and should have an aspect with a certain amount of east in it. Other points to be aimed at are a quiet and suitable elevation, a roof of simple construction, the grouping together of the flues, and the avoidance of waste of space in landings and passages. It may be added that it is a good plan to map out one's time beforehand in a subject of this sort, devoting, say, Friday to the $\frac{1}{8}$th scale drawings, Saturday morning to the ½-in. details, and Saturday afternoon to the perspective sketch.

Subject II.—THE PRINCIPAL STYLES OF ARCHITECTURE: THEIR FEATURES, MOULDINGS, AND ORNAMENTS.

[*Time of examination, three hours and a half. Maximum number of marks*, 125. *The candidate to work in the style selected by him.*]

A.—Classic and Renaissance.

1. *Explain fully, with sketches, the following terms:—Baldachino, Campanile, Abacus, Guilloche, Telamones.*

BALDACHINO: A canopy supported by columns or suspended from the roof and placed over an altar in a place of worship. Examples are still in use in many continental cities. Fig. 1 is from the church of St. George at Rome.

CAMPANILE: A tower for the reception of bells, separate from the church. The term is generally applied to the Italian examples, such as that at Verona (Fig. 2).

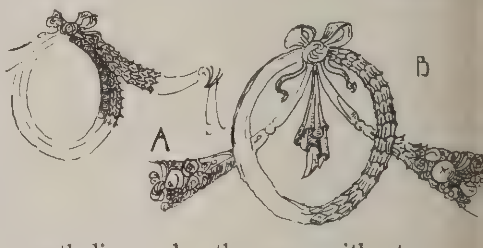
ABACUS: See definition and illustration given in Intermediate paper, subject 1, question 4, in THE BUILDERS' JOURNAL for July 11th last.

GUILLOCHE: A banded and intertwining running ornament, generally applied to a torus moulding (see Fig. 3, an example of the triple guilloche).

TELAMONES: (Greek, τλαω = I support) Figures of men used as supports, architecturally synonymous with "Atlantes," a term which is derived from the same Greek word. See Fig. 4.

2. *Sketch in detail a wreath of oval outline, the wreath to be in conjunction with festoons, one on either side. The festoons and oval wreath to be suspended from the same point by ribbon attachment. Particularly show how the festoons and wreath would meet together without confusion.*

This question tests the candidate's powers of applying historic forms to a particular problem. There are several possible solutions, two of which are here illustrated by rough sketches such as would be all that would be possible in the actual examination. In the case of *a* the foliated wreath lies under the swag without confusion, while in *b* the oval wreath is employed and the swag is kept thin until it has passed beneath it. In *a*, of course, the enclosed oval could not be used as a window or medallion frame, and the space is finished with a drop of drapery or fruit.



3. *Give a detail sketch of any portion of the Banqueting House, Whitehall, or St. Paul's Cathedral, or Somerset House, or Greenwich Hospital, with which you are acquainted.*

See illustrations.

NOTE.—A detail sketch from one only of the four examples named was asked for, but two are here given—namely, from St. Paul's and from Somerset House, which indicate the sort of sketch the examiners would expect. Similarly a portion from either the Banqueting Hall, Whitehall, or from Greenwich Hospital could be selected by the candidate if preferred. The candidate will find full measured details of the north porch of St. Paul's in THE BUILDERS' JOURNAL for February 8th, 1899.

4. *Give front and side elevation, to a scale of 4ft. to 1in., of an external enriched doorway, not less than 5ft. wide, in the manner of Michael Angelo, Galeazzo Allessi, Inigo Jones, or Christopher Wren.*

See illustrations.

NOTE.—As with question 3, two out of the four have been selected to give the candidate an idea of the sort of work required in answer to such a question. The doorway by Michael Angelo has been selected as typical, although it is less than 5ft. wide; for the purposes of the examination it would have to be adapted. (Good measured drawings of this sacristy appear in THE BUILDERS' JOURNAL for March 27th, 1901.) The doorway from Raynham Hall, Norfolk, illustrates Jones's manner, but, of

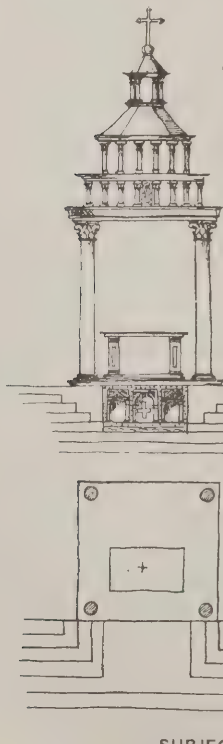


FIG 1

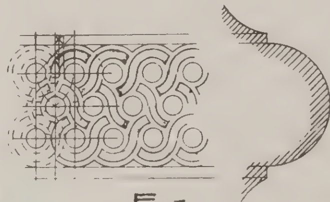


FIG. 3.

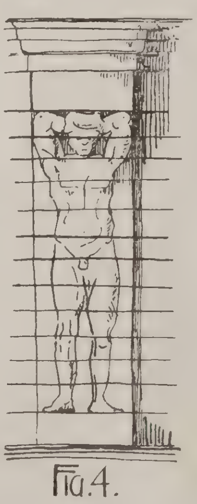


FIG. 4.

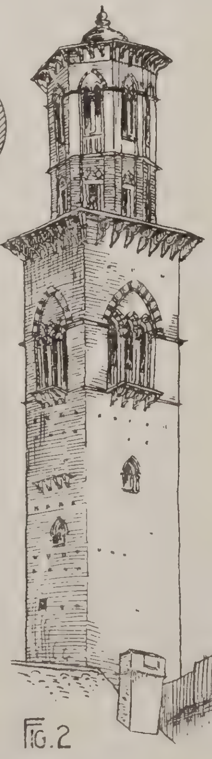
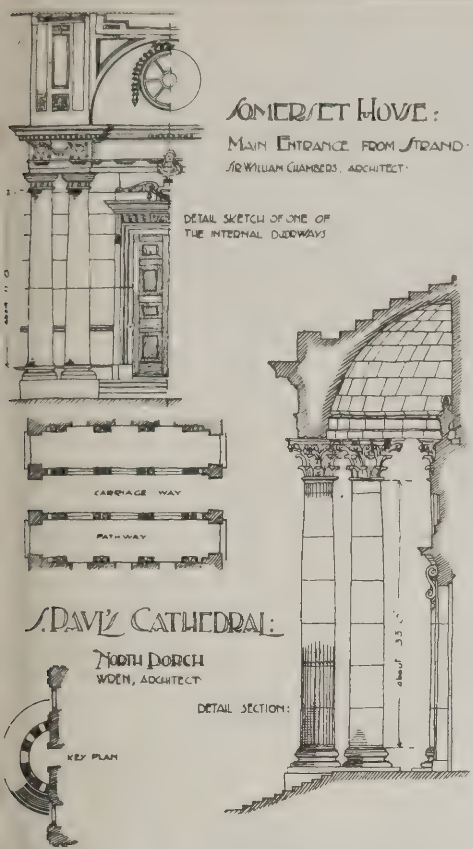


FIG. 2

SUBJECT II, PART A; ANSWERS TO QUESTION I.



SUBJECT II, PART A; ANSWER TO QUESTION 3.

course, the candidate was at liberty to choose a doorway of Allessi or Wren in place of either of those given.

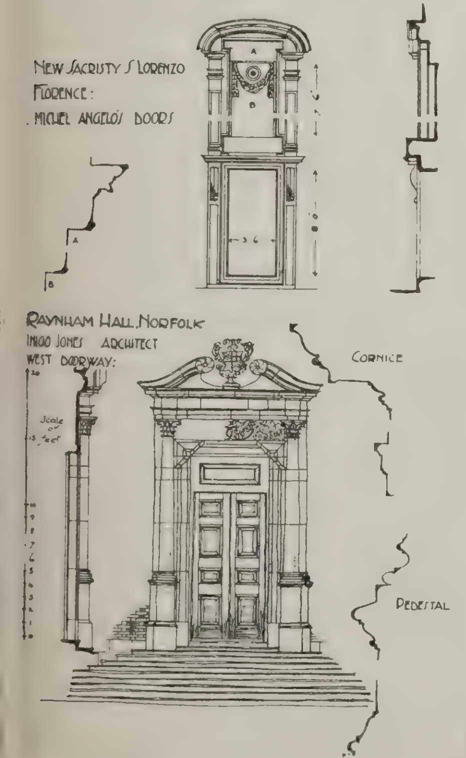
B.—*Medieval.*

5. *Describe and sketch the following:—Brattishing, Chantry, Lectern, Oriel, Squinch.*

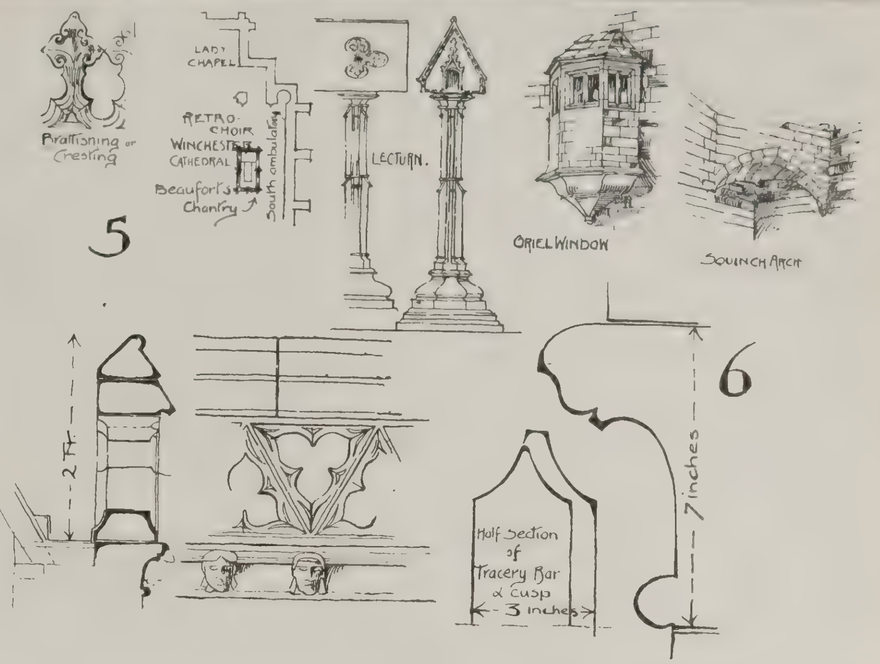
See illustrations.

BRATTISHING.—A word which occurs in many forms, signifying a cresting, or perhaps, more strictly speaking, a battlement.

CHANTRY.—Literally an endowment for the chanting of masses, but now generally applied to the chantry-chapel in which the testator desired the masses to be sung.



SUBJECT II, PART A; ANSWER TO QUESTION 4.



SUBJECT II, PART B; ANSWERS TO QUESTIONS 5 AND 6.

LECTERN.—A reading desk for the larger books—generally in England for the Bible—usually of wood or brass. Many good medieval examples still exist.

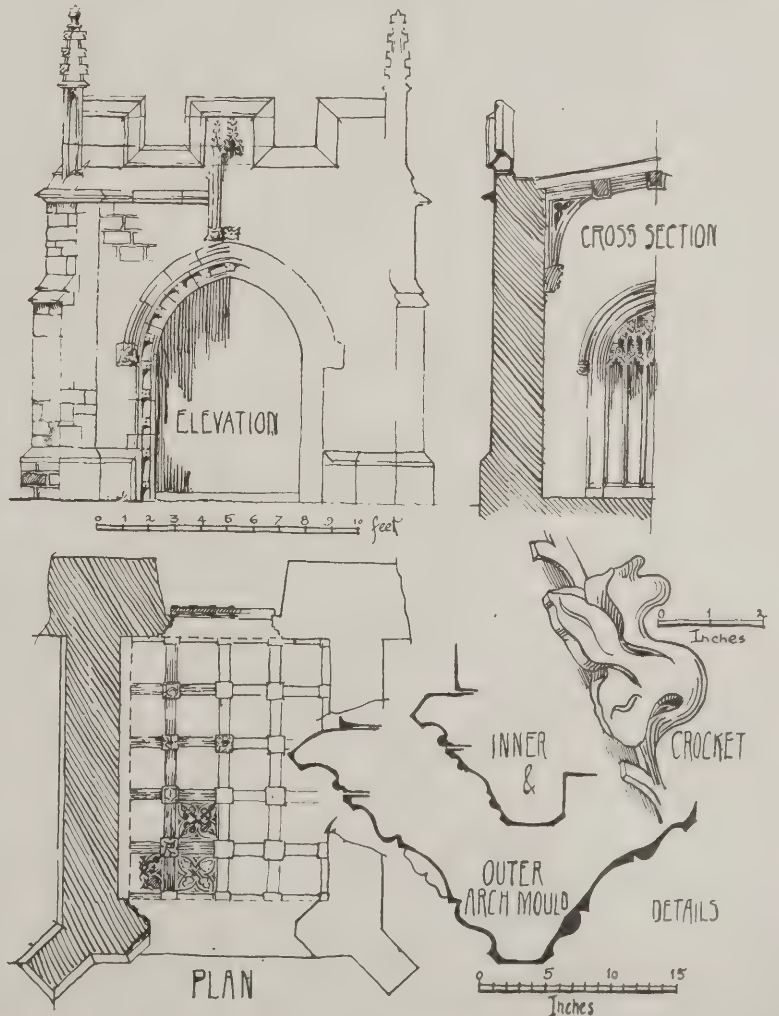
ORIEL.—Literally a place for prayer—*i.e.*, a domestic oratory, and often built with a projecting and overhanging window, hence the modern meaning of the term.

SQUINCH.—A small arch or arrangement of projecting corbels across an angle, used to carry the alternate sides of an octagonal spire or turret when the substructure was square.

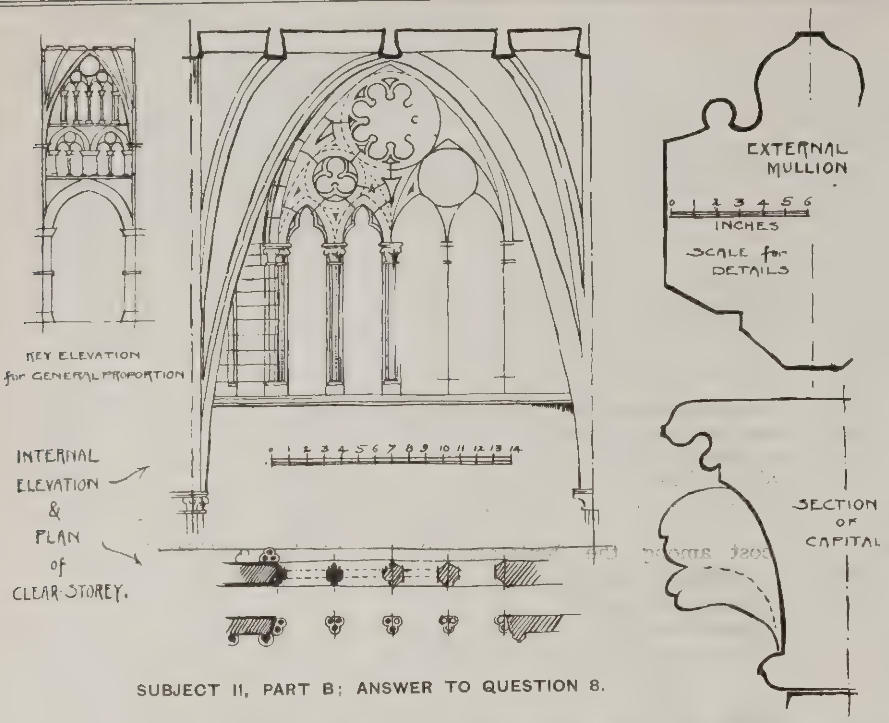
6. *Draw to 1-in. scale the elevation and section of a stone parapet: show the gutter and the start of the adjoining roof. Give some of the details full size.*

See illustrations.

7. *Draw to ½-in. scale a stone or wooden porch for a church or domestic building. Give plan, front and side elevations, cross-section, and draw some of the details half full-size.*



SUBJECT II, PART B; ANSWER TO QUESTION 7.



SUBJECT II, PART B; ANSWER TO QUESTION 8.

The illustration on the preceding page shows the stone porch of the church at Chittlehampton in Devon. The side elevation is omitted as being hardly necessary in this instance, seeing that there is no opening or other feature on either side externally. The cross-section and plan show the flat-pitch timber roof in general outline; a few details of the stonework are given to large scale. The work is of the Perpendicular period and probably somewhat late.

8. *Draw to ½-in. scale one bay of the clear-story of some cathedral or abbey. Give plan, elevation and section, show carefully and fully the jointing of the masonry, and give some details full size.*

See illustrations above.

A question of this sort seems at first sight to require a great deal more time than is usually available, but it must be remembered that it is not necessary (or even advisable) to give the general drawing in anything like detail. The question of proportion and general arrangement are far more important, and the examiner would realise that if the candidate could show these fairly accurately, with some typical jointing of masonry, and also give one or two enlarged details of the mouldings, he could also, with sufficient time, easily fill in and elaborate his drawing. The point to be aimed at, therefore, is to show as much knowledge of the subject as possible with as few lines as may be expedient. The subject here shown is from Lincoln Cathedral. A small key diagram of the whole bay elevation, as shown by the illustration, would be useful in arriving at the proper proportions.

[*Answers to the questions set in the Intermediate Examination were given in our issues for July 11th, July 25th and August 8th last.*]

An exhibition of engineering and machinery is to be held at Olympia from September 15th to October 17th inclusive. Among other features there will be a large electric fountain and air circulator. The air of the building will be drawn into the base by electric fans, and afterwards expelled, completely cleansed, cooled, and re-invigorated, at the rate of 10,000 to 12,000 cubic feet per minute.

Notes on Competitions

Cottage Homes, Cleadon, South Shields.

The conditions of this competition were criticised in this column a fortnight ago. Exception was taken to the clauses referring to remuneration, assessing, and time for sending in designs, and it was noted that efforts were being made to get these clauses, which were unsatisfactory, revised. The result has been in a measure gratifying, as may be judged from the following communication which has been sent to those whose names are upon the list of applicants for conditions: "In consequence of representations from intending competitors and others, requesting—1. An extension of time. 2. That an assessor be appointed, and 3. That the proposed remuneration be definitely specified; the Guardians have reconsidered these points and have decided—1. That an extension of time be granted from the 11th to the 28th September. 2. That the conditions of clause 2, reserving the right to call in a technical adviser, be adhered to, and 3. That the remuneration of the architect shall be on the usual terms, namely, £5 per centum upon the amount of the accepted tender, plus any further sums (if any) which may from time to time be authorised by the committee, and that the architect shall be responsible for the preparation and printing (or lithographing) of the bills of quantities for the builder, at a further remuneration of £1 5s. per centum upon the total cost of the works." These concessions are encouraging to reformers and to competitors, but they leave something to be desired. The intention of the promoters as to the method of assessing they propose to adopt is still indefinite, and will cause a considerable diminution of the number of competitors unless a prompt announcement is made that a competent assessor will be appointed. Information is being awaited upon this point. In the meanwhile time flies and the 28th September is near at hand. As regards 1¼ per cent. for quantities, this sum is probably adequate for buildings of the class to be dealt with, where repetition of identical items is frequent, but an allowance might have been made for lithography, and it should be definitely understood in advance whether an extra allowance will be made for measuring up variations at the completion of the works.

High School for Girls, Barnsley.

As it is intended that this column shall be, as far as is possible, a complete record of competitions from stage to stage, it may not be considered undesirable to mention that up to the time of going to press no reply has been received to the request made to the school governors that the remuneration of the selected architect should be at the usual rate. It will be remembered that the terms of this competition laid themselves open to the interpretation that the selection of competitors would be made from the lowest bidders, for applicants were to state the amount of commission they would be prepared to accept.

Premises for Leven Reform Co-operative Society, Ltd.

A frank confession of ignorance must be made as to the locality of Leven. Knowledge has been sought by reference to time tables, but without avail, and the post-mark is in obscurity together with the envelope that carried the conditions. One suspects the country north of the Tweed, and hazards a guess that within a radius of not many miles from Edinburgh information might be obtained. The conditions, written upon a memorandum sheet with evidence of carbon at the back, are as interesting as they are brief, and run as follows:—"Yours of——to hand anent particulars of new building. It is four large shops and commodious bakery on ground floor, with storage and offices, etc., above. Competitors to make out plans from site. Plans will be submitted to a competent assessor. Successful competitor will receive so much per cent. to see buildings erected. Plans to be in by end of September." Well, there is to be a competent assessor and what more could be desired. An interesting excursion to Leven might be organised to see the happy recipient of so much per cent. watching his buildings being erected.

Cemetery and Caretaker's House, Stewarton.

The information issued to architects for this competition is almost as brief as that for Leven, and is, if anything, less satisfactory. No plan of site is supplied, but the promoters make much of the nature of the soil, and send with their otherwise scant information the result of excavations to depths varying from one to nine feet. From this the intending competitor is able to learn that clay is the substance upon which his building will have to stand, but as to the nature of the building itself little is said, except that the caretaker's house is to consist of two rooms. There is no mention of an assessor. Premiums are to be awarded to plans placed second and third. What is to happen to the plan placed first is left to the competitor's imagination. The inference is, no doubt, that the author of it will be appointed to carry out the work, but inference is unreliable in matters of this kind.

Secondary School for Girls at Southport.

At a meeting of the Southport Education Committee held on August 30th it was reported that the offer made for the Grammar School premises in Scarisbrick Road, namely, £3,000, had been refused, the directors of the Proprietary School Co. asking £3,750. This was considered too much and the Sites Sub-Committee was instructed to get in competitive plans as soon as possible for a girls' secondary school on a site in Manchester Road.

Southend School.

The school which is to be erected on the Chalkwell Hall site at Southend-on-Sea, for which a competition is to be held among local architects, will be a mixed one, accommodating about 1,250 children in three departments. The total cost will be limited to £12 a head.

Carnegie Libraries, Dundee.

We have received a copy of the memorial addressed by members of the Dundee Institute of Architects, and other architects in Dundee, to the Lord Provost, Magistrates and Town Council, protesting against the designing of the new Carnegie libraries being put in the hands of the burgh engineer and city architect. The memorialists state they are not aware of any single instance in which a city official has been entrusted with the carrying-out of such work, and public opinion and municipal authorities in other cities have been entirely against such procedure. Without reflecting on the burgh engineer's merits as an architect, they point out that with so many official and administrative duties, together with the supervision of work of an intricate and practical nature, it is not possible for him to give the necessary amount of reflection and study which such buildings command, and if placed in his hands he must necessarily delegate the greater part of the work to irresponsible assistants. Even in the interests of true economy, the memorialists point out that if the work of designing and carrying out these libraries is done by the burgh engineer, the attendant expenses would be actually borne by the ratepayers of the city instead of by the donor. They appeal, therefore, for a competition, for which it is of first importance that a professional assessor should be nominated, who would draw up the necessary conditions in conjunction with the city officials, and would undertake the sole responsibility of selecting the best design.

List of Competitions Open.

DATE OF DELIVERY	COMPETITION.
Sept. 6	LABOURER'S COTTAGE AT GALWAY to cost £80. Premium £5. Particulars from J. Redington, secretary, Urban District Council, Galway.
Sept. 20	SCHOOL AT SUNDERLAND. Limited to local architects. Premiums of £5o, £20 and £10. Particulars from John W. Moncur, Borough Engineer, Town Hall, Sunderland.
Sept. 21	CONVALESCENT & NURSES' HOME AT GLOSSOP. Premiums of £20 & £10. Particulars from Mr. T. W. Ellison, Town Clerk, Norfolk Chambers, Glossop.
Sept. 22	SEWERAGE SCHEME FOR NEWCASTLE, Co. DOWN. Terms, references, experience, by this date, to Daniel Curran, town clerk.
Sept. 28	COTTAGE HOMES AT CLEADON and receiving house at workhouse, for Guardians of South Shields Union. Particulars from J. W. Coulson, Union Offices, South Shields.
Sept. 28	SEWAGE DISPOSAL SCHEME FOR ELLESMERE. Premium of £20. Particulars from R. E. Lloyd, clerk to Urban District Council, Ellesmere.
Sept. 29	REBUILDING OF HENSHAW'S BLIND ASYLUM AT MANCHESTER. Limited to Manchester architects. Premiums £100, £50 and £25. Assessor, Mr. John Holden, F.R.I.B.A.
Oct. 1	ALPHABET COMPETITION. Prizes of £20, £10 and £5. For particulars see "Architectural Review."
Oct. 31	BOURSE AT CAIRO.—Premiums of £E250 and £E100. International competition. Designs to be submitted to the "Corporation des Agents de Change," Cairo, Egypt.
Dec. 14	FOUNDLING HOSPITAL, MONTEVIDEO.—Four selected designs in preliminary competition to be awarded £212 each; first premium of £742 in final competition. Particulars from Consulate-General for Uruguay, 5 & 6, Clement's Inn, London, W.C.

CLEVELEYS COTTAGE EXHIBITION.

Judges' Award.

The following is the report and list of awards made by the judges in the cottage competition in connection with the exhibition now open at Cleveleys, near Fleetwood, on the Lancashire coast. The judges were Mr. John H. Woodhouse, F.R.I.B.A., president of the Manchester Society of Architects; Mr. Charles H. Barnsley, Birmingham, past-president of the Institute of Builders; and Mr. H. R. Aldridge, secretary of the National Housing Reform Council. They were appointed respectively by the Royal Institute of British Architects, the Institute of Builders, and the National Housing Reform Council.

Their report is as follows:—

The task of adjudicating in classes I. and II. of these competitions was rendered very difficult by the great differences in cost among the buildings erected. The conditions asked for "the best and most economical cottage," either single or in pairs, without any limitation as to cost, and the competitors have built cottages on some 30 different plans, which can be duplicated at a cost varying from £175 to £500 for each cottage. This variety adds to the interest of the exhibition, and we consider that most of the competitors are to be congratulated on their success in solving their differing problems on practical lines, and in many cases with pleasing architectural result; although we think that some of the buildings are too large to be considered as "economical cottages." Taking as our first consideration the ratio between cost and accommodation in each case, we selected, after careful study, a number of cottages which were fairly entitled to be called economical. Of these several were disqualified through faults of planning, while a few cottages, with very excellent and economical plans, were so lacking in architectural character that we excluded them from the list of awards. Other cottages possessing many valuable features were disqualified as a result of their incompleteness at the time of our award. Of the remaining cottages we very carefully compared the architectural character, economy and convenience of planning, soundness of construction, and cost of maintenance, and we award as follows:—

CLASS I.

First prize (£100).—Exhibit No. 27: architect, Albert E. Done, Blackpool; builder, various local builders.

Second prize (£50).—Exhibit No. 14: architect, Bertram Drummond, A.R.I.B.A., Blackpool; builders, J. Preston and Sons, Fleetwood.

Third prize (£25).—Exhibit No. 22: architect, Patrick Abercrombie, Chester; builder, E. Saville, Blackpool.

Honourable mention.—Exhibit No. 32: architects and builders, Lancaster & Atkinson, Fleetwood. Exhibit No. 24: architect, Gilbert Fraser, A.R.I.B.A., Liverpool; builders, Lancaster & Atkinson, Fleetwood. Exhibit No. 8: architects and builders, Dickinson & Kirkham, Bolton.

Highly commended (not for competition).—Exhibit No. 13: builder, J. P. Wilson, Fleetwood. Exhibit No. 31: architects, Tom G. Lumb & Co., Blackpool.

CLASS II.

First prize (£100).—Exhibit No. 42 and 43; architect, Q. Mangnall Bluhm, St. Annes-on-the-Sea; builders, Lancaster & Atkinson, Fleetwood.

Second prize (£50).—Exhibit No. 25 and 26: architect, T. Faulkner Shepheard, Birkenhead; builders, Leach & Sons, Cleveleys.

Third prize (£25).—Exhibit No. 11 and 12: architect, Alfred T. Martindale, Bridlington; builder, T. V. Martindale, Bridlington.

Honourable mention.—Exhibit No. 28 and 29: architect, John H. Mawson, Cleveleys; builder, Thomas Riley, Fleetwood.

A. A. MEETINGS NEXT SESSION.

The following is the syllabus of the ordinary general meetings of the Architectural Association for the session 1906-7:—

1906.
Oct. 5—Annual General Meeting. President's Address and Distribution of Prizes. R. S. Balfour.
,, 19—The Architecture of the Roman Empire. Alan Potter.
Nov. 2—Axiality in Architeotural Composition. H. Stannus.
,, 30—The Difficulties which beset an Architect in London, with special regard to existing legislation. William Woodward.
Dec. 14—The Architecture of Sicily. W. Howard Seth-Smith.

1907.
Jan. 11—(Subject to be announced.) Temple Moore.
,, 25—(To be announced.)
Feb. 8—Regent Street. Mervyn E. Macartney.
,, 22—Training and Workmanship. Gerald C. Horsley.
March 8—Spanish Architecture. A. N. Prentice.
,, 22—Sanatoria. Edwin T. Hall.
April 12—Westminster Cathedral. J. A. Marshall.
,, 24—Theatres. Frank T. Verity.

It has been decided that these papers shall be printed *verbatim*, and illustrated, in the Journal of the Architectural Association.

NEW ART GALLERY, MUSEUM AND LIBRARY FOR MANCHESTER.

A special committee appointed by the Manchester Corporation to report upon the future use of the old Infirmary site in Piccadilly recommends the allocation of the ground to the Public Free Libraries Committee and the Art Gallery Committee for the erection of an Art Gallery, Museum and Library. The site contains 19,954 square yards, exclusive of the area already devoted to street widening, and it was purchased by the Corporation for £400,000 under the terms of the Act of 1903. Vacant possession is expected in two or three years. The Reference Library is at present housed in the old Town Hall, in King Street, but that building has been sold, and possession must be given not later than 1913. The Art Gallery in Mosley Street has long been inadequate, and no satisfactory addition to the buildings is feasible. The Piccadilly site will allow of the erection of a building which shall be worthy of the city, and the recommendation of the committee is almost certain to be adopted, except, perhaps, so far as regards the Museum portion of the scheme. In the Owens College Museum Manchester possesses one of the finest institutions of the kind out of London.

This plan will make it necessary for the proprietors of the Royal Exchange to turn to an addition of the present building for an escape from the congestion and overcrowding of which so much complaint is made.

The suggestion for a new Exchange upon the Piccadilly site never secured much support because of the great dislocation of business arrangements which the change would have involved.

BLACKFRIARS BRIDGE.

A Note on the Old and New Structures.

Blackfriars Bridge has come into public notice recently by reason of the project to widen it in connection with the over-bridge tramway service. The *City Press* therefore takes the occasion to give an account of its erection. The present structure, which was opened in 1869, was designed by Joseph Cubitt, who was successful in the open competition instituted by the City Corporation when it was decided to rebuild. The bridge comprises five spans, and cost, approximately, £270,000. The piers and abutments are of granite, while in the decorative work Portland stone and bronze are employed. Outstanding features are the red polished granite columns below a parapet of Gothic design. One detail about the bridge not generally known is that on the sea side are figures of sea birds carved in stone, while the river side is similarly adorned with land-loving bipeds.

A 1759 Competition.

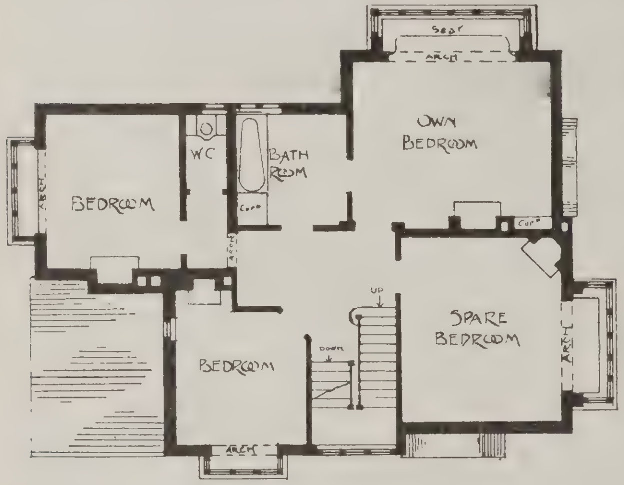
The old bridge, which the present bridge replaced, was the subject of a controversy in which Dr. Johnson was a noted participant. In 1759 the Corporation decided upon the erection of a bridge at Blackfriars, and, according to custom, invited designs. About twenty architects competed, and amongst the number were Robert Mylne, Smeaton, and Dr. Johnson's friend, Gwynn, the last-named being highly esteemed as the author of various improvements in the City. The Common Council, however, accepted the design of Mylne, who was unknown in London, although he had studied in Italy, and gained the first prize at the Academy of St. Luke. The feature of the design was the use of the elliptical arch, a feature which gave rise to much adverse comment, fears being expressed as to its practicability and safety.

The Heavy Flounderer.

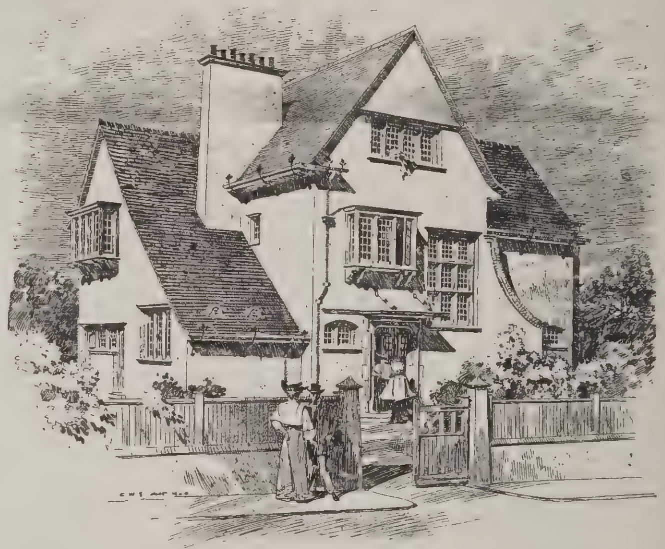
Dr. Johnson was foremost in the fray, floundering amid the technicalities of architecture in defence of his friend, who had used the semi-circular arch in his design. By all accounts, the Doctor showed his palpable ignorance regarding matters architectural, endeavouring to show that the pointed arch was inherently weak and inefficient. In the process he turned the thunder of his wrath against Mylne, disparaging him and his work, and stopping at nothing to bring about the reversal of the decision of the Corporation. He went so far as to assert that Mylne only succeeded in becoming the prizeman at Rome because his compeers were boys, and that architecture had sunk to a frightfully low ebb at Rome.

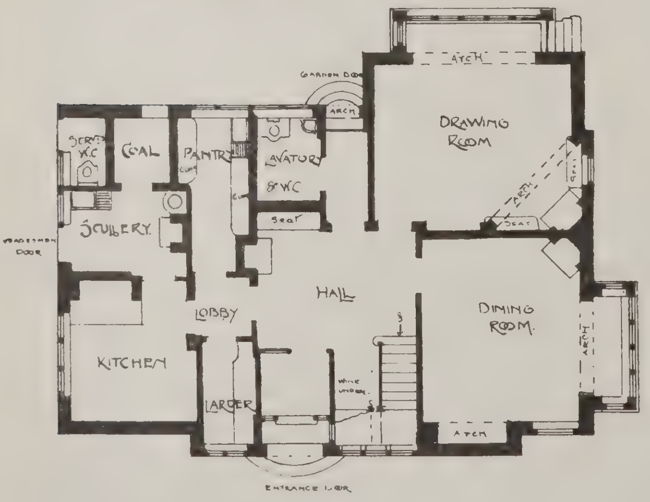
The last of a series of letters on the subject from the pen of the famous Doctor is worth an excerpt: "I again venture to declare, in defiance of this contemptuous superiority, that a straight line will bear no weight. Not even the science of Vasari will make that form strong which the laws of Nature have condemned to weakness." So the worthy Doctor pitted himself against the architect, holding his belief to the last, and predicting failure and disaster. Controversy once aroused was difficult to quell, and almost everything in connection with the project was disapproved. In spite of all, however, Mylne went steadily on, and finished his work in 1769, when the bridge was acknowledged to be a success.

The Baldachino at Westminster Cathedral is now nearing completion. It is supported by eight columns 14ft. in height, which rest on pedestals rising 6ft. 6ins. The columns are of yellow Verona marble. Five steps of white statuary lead up to the altar, which is formed by a solid block of grey Cornish granite; behind it runs a low wall of Greek cipolin.

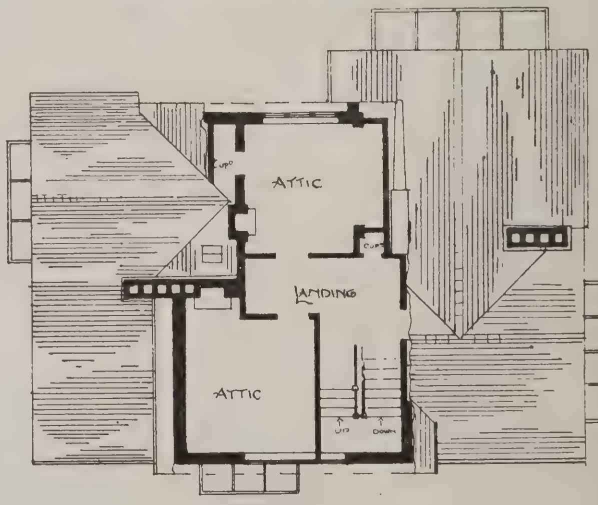


FIRST FLOOR PLAN





GROUND FLOOR PLAN.



ATTIC AND ROOF PLAN

HOUSE ON THE CHART, REIGATE. C. E. SALMON, ARCHITECT.

This house has been erected on the Chart, one of the highest parts of Reigate, and commands extensive views of the North and South Downs. The exterior is rough-cast a cream colour (gained by using a particular kind of sand). All exterior woodwork is painted dark green. The porch is built in Box Ground Bath stone with an oak hood. The roof is tiled with Collier's hand-made sand-faced tiles, which tone to a dark colour. The gutter brackets and other ironwork were wrought by a local smith. In the hall and dining-room plain square panelling and oak flooring are employed, and an ingle-nook is obtained in the drawing-room without the usual external excrescence. The fencing and gates are of oak, the fencing being built on a rough-cast wall with a brick coping. The builder was Mr. J. Waycott, of Reigate, and the architect Mr. C. E. Salmon, of Bell Street, Reigate.

Enquiries Answered.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional, or legal matters.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Municipal Architectural Work.

Writing in reference to the enquiry under this heading on page 91 of our issue for August 22nd, A. S. says: "There is only *one* examination held by the Incorporated Association of Municipal and County Engineers, not two, and when you have passed you are entitled to become a graduate (provided you are proposed and seconded); but to become an Associate you must hold an appointment in a municipal office, and to become a member you must hold a *chief* appointment in a municipal office."

Destroyed Indentures.

YOUNG ARCHITECT writes: "My indentures have been accidentally burned, together with other documents. What should I do to get same replaced? The principal with whom I served is in America, and the witness to the signatures is dead. In the event of my having new indentures, would it be legally correct to date the signing of them back to the original date of signing the destroyed one?"

If your indentures are still running, it is quite easy to have another set drawn up and executed at the present date—the loss of the original document being recited in the new deed. If the indentures have been duly served and are now expired, the only course I can suggest is that your late principal should give you a certificate to the effect that you did serve with him from such and such a date to such and such a date, and he might, if desired, add the necessary words to state that he understands the original document has been burned, and to express his satisfaction with your conduct during the period named.

F. S. I.

Adjoining Owners and Use of Chimneys.

S. H. S. writes: "A certain corporation leased seven sites to A, who built thereon seven houses. It was A's intention to take the adjoining sites; therefore in building his gable the chimneys for the eighth house were carried up as well as those of the seventh house. But B came along and the corporation leased to him the eighth and other sites. B put up his houses and used the chimneys that A had erected. (1) Is B legally liable to pay for the adopted chimneys? (2) What action can be taken in the absence of an official valuation? (3) The town clerk refuses to act as 'collector' in the matter. Is he right in this? I myself am very doubtful about it."

I am of opinion that:—(1) A's remedy is against B only, and that B is legally liable. (2) That A should claim the sum that he is advised is reasonable from B, and if not paid he should take action to recover it in the County Court, producing his lease as documentary evidence, and summoning the borough surveyor as a witness as to value. (3) The town clerk is quite right in refusing to act as "collector." You should endeavour to keep the issue as simple as possible—do not "cloud" your evidence by introducing any more of the negotiations and correspondence than is unavoidable.

F. S. I.

Ridding a House of Black Beetles.

DEVON writes: "Can you suggest any ready means of getting rid of black beetles in a detached two-storey house in the country? It is comparatively new, and has just been repapered and painted."

There is no "royal road" to cleanse a house of black beetles, but almost any of the much-advertised preparations will prove efficacious in keeping them down. All crevices should be stopped in which they can penetrate, and all cupboards, &c., should be kept scrupulously clean.

F. S. I.

Fees for Valuing and Surveying Building Estate.

LONDON.—CONSTANT READER writes: "What are the recognised charges for—(1) valuing a building estate prior to purchase or development, and (2) negotiating the purchase? (3) Would the fees be payable in the event of the purchase not being completed? (4) Negotiations with adjoining owners; (5) special negotiations with local authorities; (6) surveying estate; (7) taking levels and preparing drawings of schemes of development and plans of roads and sewers and obtaining approval of local authorities; (8) preparing contract drawings, specification, and obtaining tenders and superintending the work, &c.; (9) taking out and providing bills of quantities."

The Royal Institute of British Architects has sanctioned a scale of professional fees, and it would be well for you to procure a copy (address, the Secretary of the Institute, 9, Conduit Street, Hanover Square, London, W.), or an extract from the scale may be found in "Laxton's Price Book." To answer your queries seriatim:—(1) 1% to £1,000 and $\frac{1}{2}$% above that to £10,000; by special arrangement for small or very large sums. (2) Charge according to circumstances and labour involved. (3) Not unless you are specially retained. (4, 5, 6 and 7) As No. 2. (8) 5% on total cost, besides travelling and incidental expenses—2$\frac{1}{2}$% of this fee is considered to be for drawings and specification, &c., and a further $\frac{1}{2}$% for obtaining tenders. (9) Quantities are usually charged for at the rate of 2$\frac{1}{2}$% for works up to, say, £2,000; 1$\frac{1}{2}$% up to £10,000, and 1% for larger works. There is, of course, no law making any of the above charges compulsory.

F. S. I.

Our Plates

Hillbrook Place, Iver Heath, Bucks.

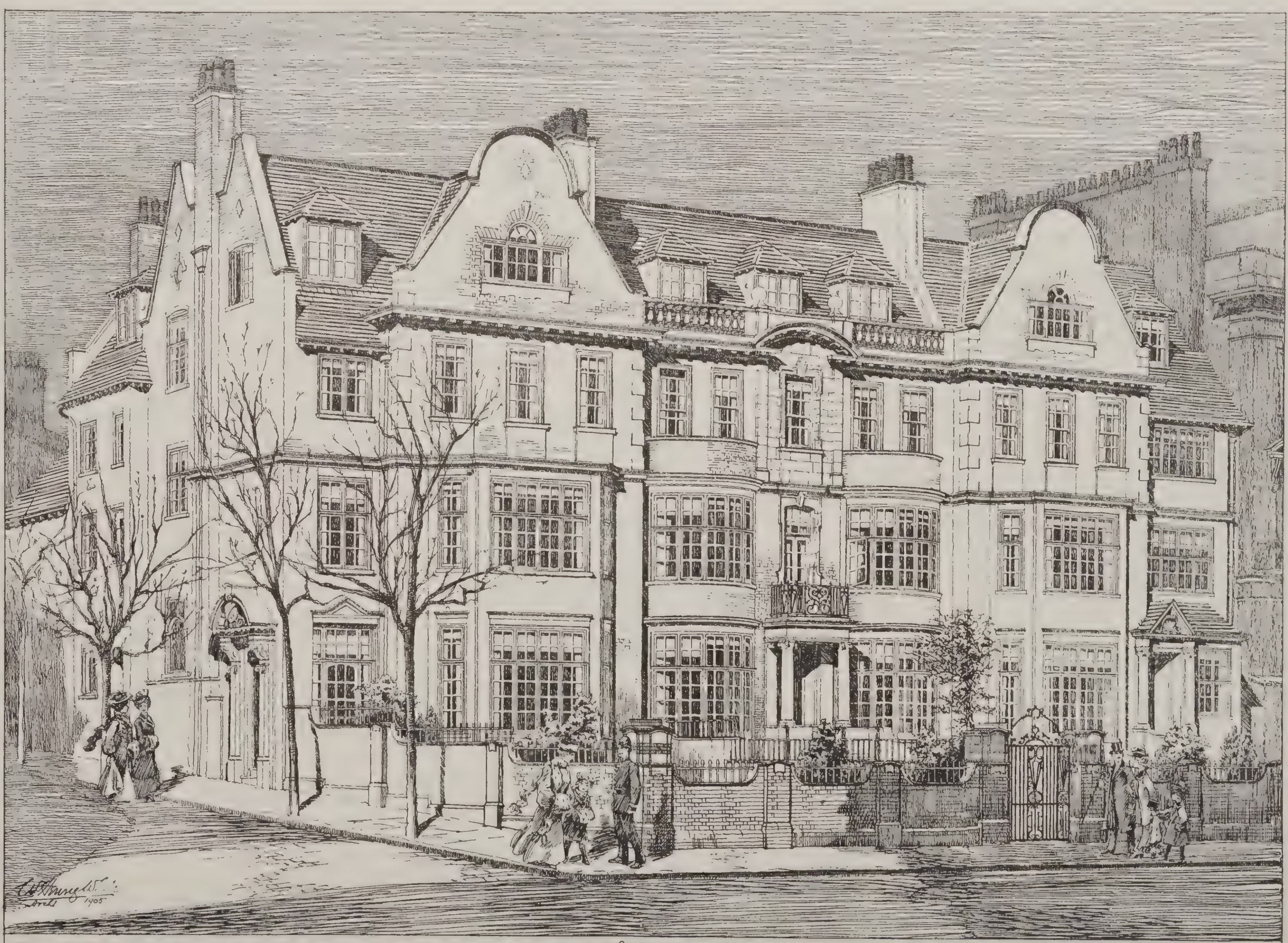
This house has been designed for a fine site in Buckinghamshire. The scheme may be said to have been dominated by the desire that the house should be plain and unpretentious in every way, with large rooms and uninterrupted floor spaces. Ample bedroom and service accommodation were required, and, in addition, a broad corridor on ground and first floors was considered an essential factor in the scheme. The plan has therefore been evolved upon these lines, and through such practical considerations. For the materials, local hand-made facing bricks were proposed for the walls, making use of varying colour and fired headers to obtain some play in surface and tone. Hand-made tiles with a rough surface and uneven tone were intended for the roofs. Internally there would be little ornamentation other than simple plasterwork, reliance being placed upon the proportions of the rooms and generally plain character of the design. The architects are Messrs. Forsyth and Maule, FF.R.I.B.A., of London, W.

A PLEA FOR FORMAL GARDENING.

It is an interesting fact that William Morris, writing so far back as the end of the seventies, attacked landscape gardening, not for its artificiality, but for its lack of order and design. He knew that no work of art should put on the airs of Nature; that, as houses ought not to be built to look like caves, so gardens ought not be designed to look like flowery meadows or stretches of woodland. Landscape gardening, which came into fashion when we were building the ugliest houses, was an attempt to ignore the existence of the house. Shrubberies were grown to hide it as best they could, and paths twisted about in a helpless reluctance to approach it. But, when men built beautiful houses, they had no desire for landscape or for any kind of wild gardening. They were proud of their handiwork and did not look to Nature or any pretence of Nature to conceal it from them. So the house and the garden were all part of one design, of which the house was the centre, giving a purpose and meaning to the whole; and this idea that the house shall dominate and explain the garden is the principle upon which all formal gardening is based, whereas all wild gardening is based upon a despair of the house and a desire to ignore it.

Now that we are beginning to build beautiful houses again, we are beginning also to design formal gardens to suit them. But, if we make up our minds for a formal garden, we must understand clearly what are the proper limits of its formality; and, in the first place, we must know that a formal garden does not mean formal flowers. The best gardeners now delight in growing plants in conditions that will show off their beauty to the best advantage. It is the business of formal gardening to do this; to use its material so that its characteristic beauty may be displayed to the best advantage.

It is a main principle of formal gardening that a gardener may do anything he chooses with his materials to increase their use or beauty, but that he must not play tricks upon them merely to show how far he can pervert them from the course of Nature. Thus, where a tree or shrub is grown for its own sake, to clip it is to spoil its natural beauty for no reason. But, when trees or shrubs are used to make a hedge, clipping increases their beauty as it increases their use. A hedge, properly used, is only a kind of living wall, and you can see at a glance that it is grown not for its own sake, but to serve as a wall. So, whatever treatment makes a better wall of it is justified; and the formal gardener will not try to conceal his living walls, but will make them play a part in the beauty of his design. Everyone must feel the charm of well-kept yew hedges in an old garden: they are a sign that order and peace and a delight in beautiful things have been long established there. This is the secret of the charm of formal gardens, and it is a charm that we cannot find in any flowery wilderness, still less in the most cunning imitation of one.—Extracts from an article in the *Times* for Saturday last.

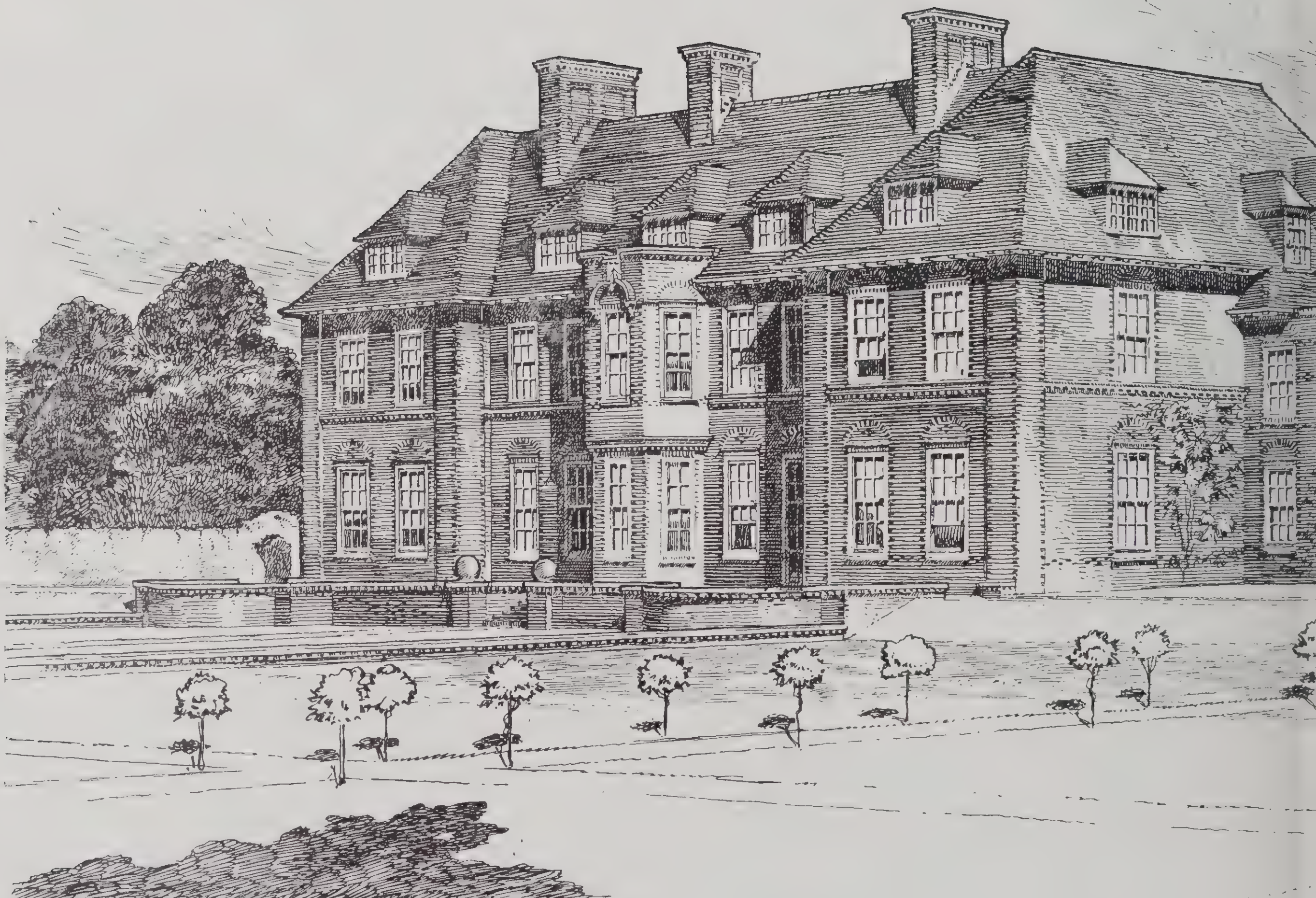


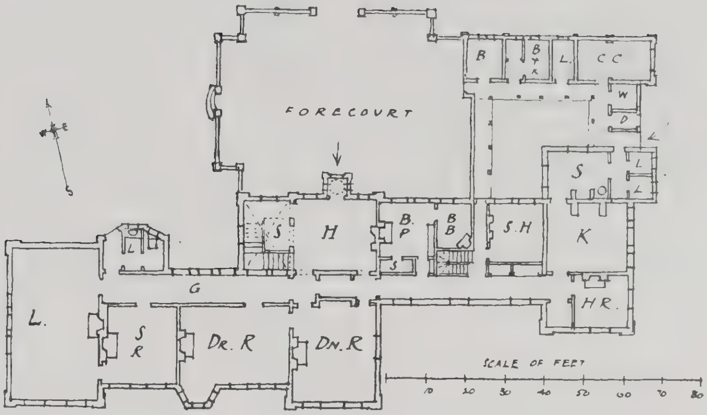
THREE HOVSES, NORTH GATE, REGENT'S PARK: N.W.

W. HENRY WHITE F.R.I.B.A. ARCHITECT
14 CAVENDISH PLACE CAVENDISH SQUARE. W.

Supplement to
The Builders' Journal and Architectural Engineer,
Wednesday, September 5th, 1906.

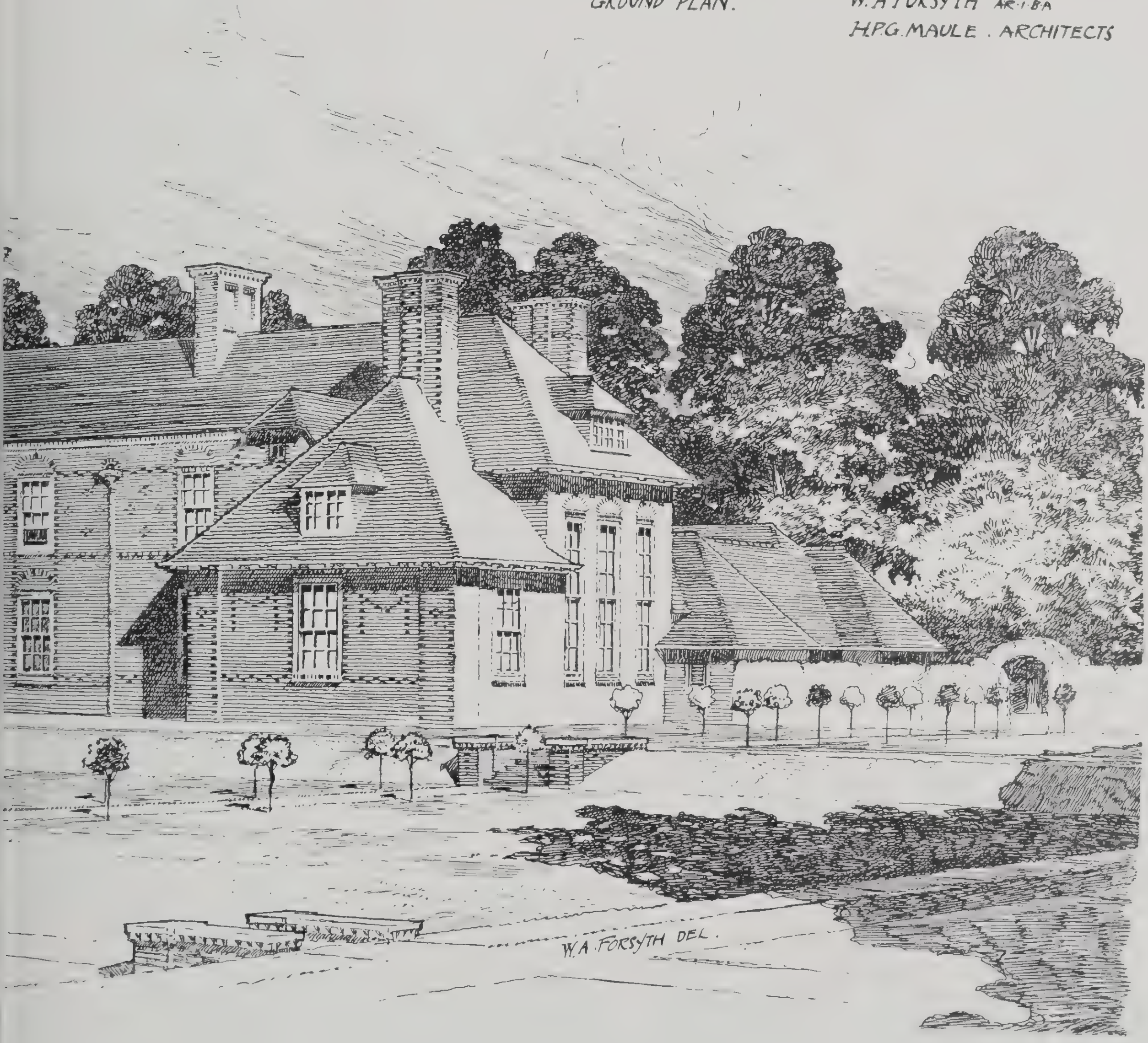
HILLBROOK PLACE
IVER-HEATH, BUCKS.



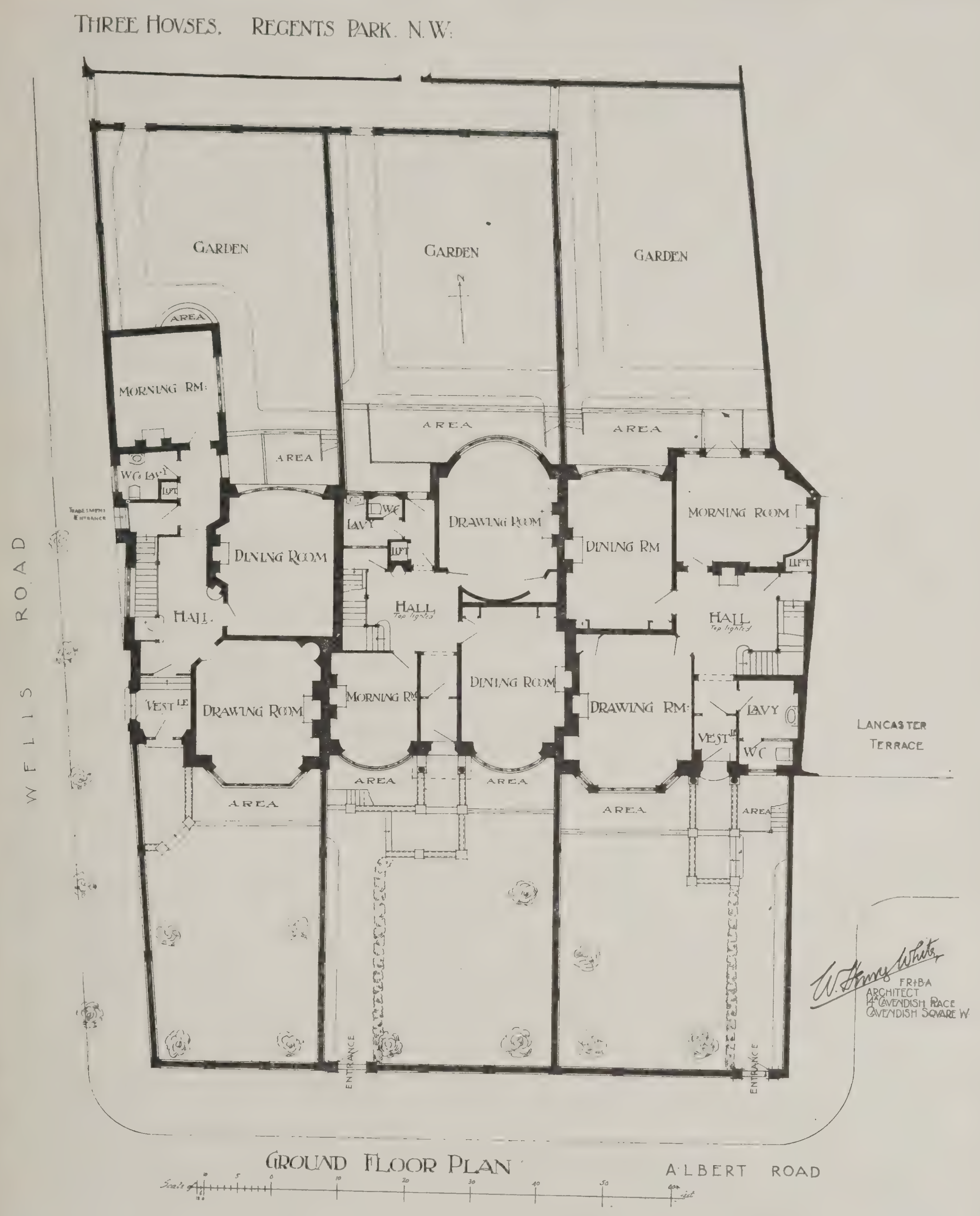


GROUND PLAN.

W. A FORSYTH AR.I.B.A
H.P.G. MAULE. ARCHITECTS


W.A. FORSYTH DEL.

LIBRARY
OF THE
UNIVERSITY OF ILLINOIS



The property on the north side of Regent's Park is undergoing great changes, and efforts are being made to improve the character of the neighbourhood by removing the old commonplace houses and terraces, which were ill-planned and of no architectural character, and substituting in place of them good-class town houses of the rental value of £300 to £400 per annum. The three houses here shown face south and overlook Regent's Park. They were built by Messrs. Holloway Brothers, of Belvedere Road, S.E., from the designs of Mr. W. Henry White, F.R.I.B.A., of No. 14A, Cavendish Place, W. The houses are faced with Lawrence's bright red bricks, with Portland stone dressings and tiled roofs; the interiors have been carefully arranged and are excellently finished. The ground floors are well above the garden, so that the basements are only half "underground." By sloping the paths and dividing up the steps, objectionable flights to the front doors have been avoided. It will be noticed that the plan of each house is distinct, thus avoiding monotony, and by recessing the centre house the grouping has been relieved from the flatness of the ordinary terrace effect. The perspective view was hung in this year's Royal Academy.

Notes and News

Two new Branch Libraries at Liverpool are to be built, the cost of one of which (at Walton) will be borne by Mr. Carnegie.

In Yattendon Parish Church recently Sir Arthur Rücker unveiled a marble tablet to the memory of the late Mr. Alfred Waterhouse.

The Savoy Hotel Restaurant has just been redecorated. Formerly the prevailing tone was dark mahogany, but this has now given place to a soft white, which is most effective.

New Municipal Buildings at Battersea.—On Saturday last the first portion of the new baths, museum and branch library in Plough Road was opened to the public. The total cost has been between £10,000 and £11,000, and the work has been carried out by direct labour.

Messrs. Carter & Co., the well-known makers of floor and wall tiles, &c., have moved their London office from 43, Essex Street, Strand, to 29, Albert Embankment, S.E., where they have more commodious premises, both for stock and for displaying their glazed fireplaces, dadoes, &c., in the showrooms.

New Libraries in Islington.—Islington will shortly have a new central public library and four branches. One of these, the north branch, in Manor Gardens, Holloway Road, is now all but finished; it will be formally opened on September 20th. This library is interesting as being on the open access system.

A £20,000 Housing Scheme.—The Sunderland Rural Council propose to obtain land at Ryhope Colliery and Tunstall, two pit villages, where they will erect 96 dwellings, in 12 blocks of eight, thus affording accommodation for 528 persons. The scheme will involve £20,000, which sum is to be raised by loan.

Ulster Society of Architects.—At a special general meeting on August 24th a resolution was unanimously passed re-affirming the resolution of July 9th last, that the Society's affiliation with the Royal Institute of the Architects of Ireland should be terminated, and instructions were given to the council to apply for direct affiliation with the Royal Institute of British Architects. (See p. 102 of last week's issue.)

Restoration of Carnarvon Castle.—One of the architects of the Board of Works has been commissioned to pay a visit of inspection to Carnarvon Castle this week for the purpose of preparing a report with a view to the continuance of the scheme of restoration which has been in progress for many years. It is generally expected that the Government may see its way to make a substantial grant at an early date to carry on the work.

York Architectural Society: Visit to Hull.—The York Architectural Society recently paid a visit to Hull in order to inspect several important buildings recently erected there. The first building visited was the new art school, for which Messrs. Lanchester and Rickards were the architects. It cost about £16,000. The new central public library was next visited. This has been built from designs by Mr. J. S. Gibson, F.R.I.B.A., at a cost of £21,000, the principal frontage being in Albion Street. Finally, the visitors inspected the new baths in Beverley Road, built from the designs of the City Engineer, Mr. A. E. White, A.M.I.C.E.; the men's swimming bath is 100ft. by 35ft.

Stonework Decay in Sea Air.—The stonework of Holy Trinity Church, Hastings, which has suffered through exposure to the sea air, has been renovated by Messrs. R. Francis & Son, of Eastbourne, who renewed the decayed Caen stone at the west doorway and rose window, and reinstated it with Monk's Park stone, the whole being treated with "Fluate," to harden and preserve the new work. The renovation has been carried out under the supervision of Mr. Henry Ward, A.R.I.B.A., of Hastings.

The Restoration of York Minster.—The Dean of York has issued another "Occasional Paper"—the ninth—on the progress made with the restoration of York Minster during the past twelve months. Chief attention has been given to the restoration of the great west window (which measures 54 ft. 4 ins. in height, and 25 ft. 4 ins. in width, containing 958 superficial feet of glass), and the completion of two of the flying buttresses. As regards the west window, large plates of "Hartley's rough patent glass" had been inserted in order to protect the mediæval painted glass, but these plates had been fastened into their position with iron bars, which had contracted and expanded, breaking the rough plates and splitting the stone mullions. These latter have now been thoroughly repaired, and the rough glass removed and replaced by clear "crown glass," in diamond quarries. Mr. G. F. Bodley, R.A., is the architect in charge.

Leeds Institute, Department of Building.—The results of the May examinations in building construction, just issued by the Board of Education, show that out of 101 students examined in this department, no fewer than 87 have passed; 36 of these obtaining first-class certificates and 51 second-class, there being only 14 failures. Successes have been gained in all four stages of the subject. This is the finest result yet obtained at the Leeds Institute in this subject, the average for the last two years being about 80 per cent., while this year's results are well over 86 per cent. There were 807 class students in this department last session. Next session's opening lectures are to be given on September 10th and 12th respectively, at 7.30 p.m., by the head of the department (Mr. James Neill), the subjects being: 1, "The Training of the Modern Architect"; 2, "The Education of the Builder." Admission to the lectures is free.

An Open-Air School.—A guide to Garden City (Letchworth) has been issued from the offices of the First Garden City Co., Ltd., 326a, High Holborn, W.C., price 2d. (post free 3½d.). It gives detailed particulars of the estate and is very fully illustrated with photographs and drawings of houses built there. Among the illustrations are an elevation and plan of the open-air school now being erected at a cost of £25,000; it will not be completed until this time next year. The plan shows a semi-circular corridor, covered in on top but open on one side, and this we take to be equivalent to the "classroom." The corridor runs round a "cloister garden" and has recesses forming "comfortable dining-places, while the hall and west alcove (though not entirely shut in) give ample scope for the joys of the fireside. Books and other necessaries, when not in use, can be placed in watertight cupboards." In addition, an oval swimming bath, with dressing-rooms, and a kitchen block are comprised in the scheme.

THE CATARACT DAM.

A Great Work.

For the water-supply of Sydney the Cataract Dam, the biggest in Australia, is now in course of construction. It is a huge wall of Cyclopean masonry and concrete, rising 154ft. sheer from the river-bed, and extending 40ft. below it into the solid sandstone: almost vertical on the up-stream face and sweeping away with a great bold curve on the down-stream, till the wall has increased from a thickness of 16ft. at the top to 160ft. at the river-bed level. It will impound 21,411,000,000 gallons, or nearly 1,000 days' supply for Sydney, and the cost of constructing it will be £325,500.

Its Construction.

The up-stream face is constructed of moulded blocks of concrete 5ft. by 2ft. 6ins. by 2ft., and the down-stream of a layer of bluestone concrete 6ft. thick; while the body of the dam consists of rubble, blocks of roughly-hewn sandstone weighing from three to five tons, set in cement mortar, and packed in with bluestone concrete—142,300 cubic yards of solid masonry and concrete, containing 105,000 casks of cement. One feature breaks the monotony of the huge expanse of wall—the outlet works tower on the up-stream side, on which are placed at varying heights the sluices, which admit the water into two great wells, and thence into the 48-in. diameter outlet pipes.

The mass of material forming the dam has been handled entirely by electric-driven machinery—electric-driven mixers for the concrete and mortar, overhead cableways to run out the stone and concrete, electric cranes to place it.

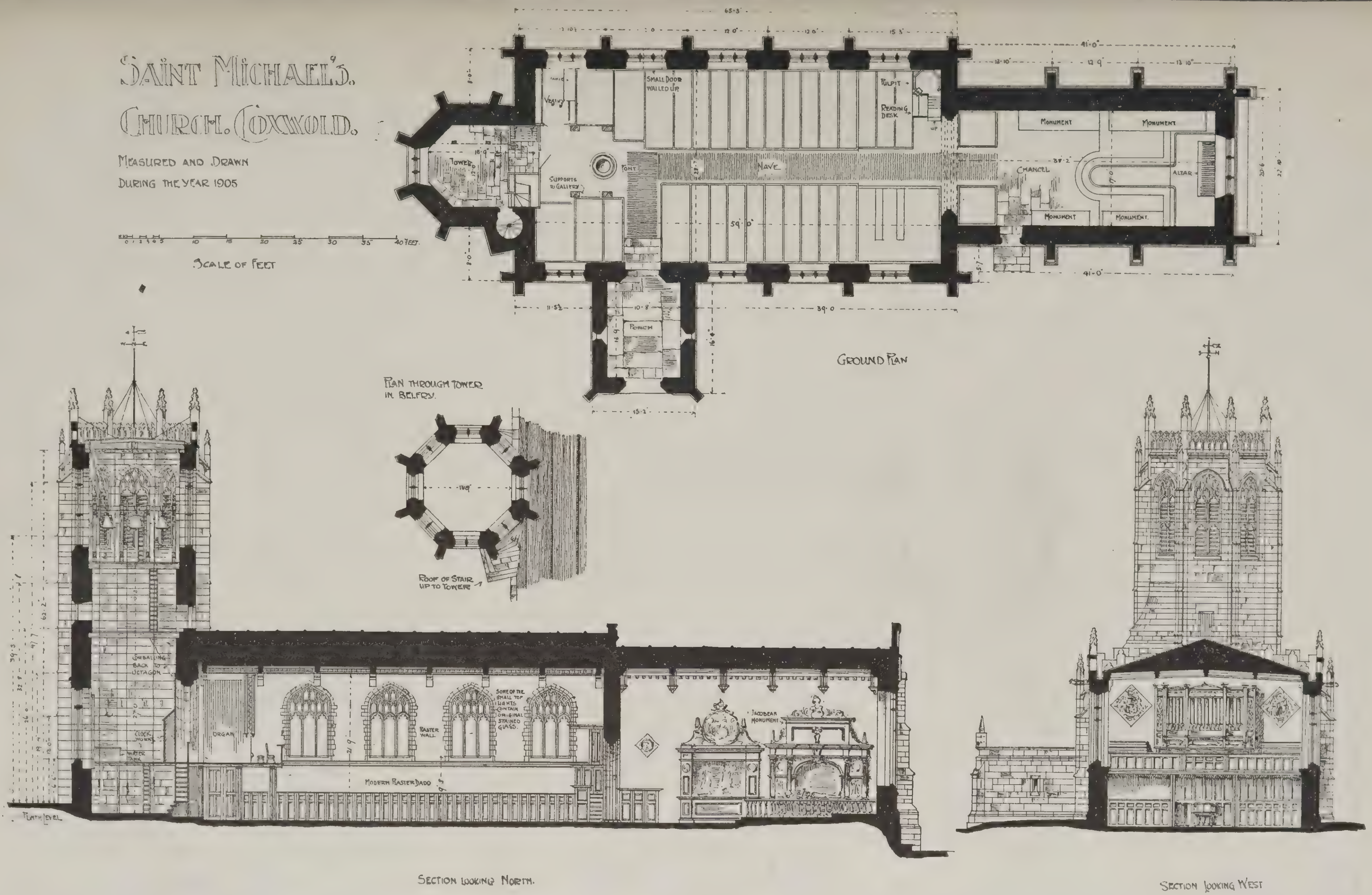
Living Down Criticism.

The opening-up of the site, the excavation for foundations, and the construction of a considerable bulk of the dam were carried out by the Public Works engineers, until June last year, when a contract was let to Messrs. Lane and Peters for the completion of the work—the Department supplying the cement, which is manufactured by the Commonwealth Co. The work has progressed steadily day and night since, and will be finished in May, 1907. A great controversy arose in connection with this work, and charges of all sorts were levelled at the engineers constructing it. (Mr. L. A. B. Wade, M.I.C.E., is the chief engineer.) Two Royal Commissions enquired into it, and the name of the Cataract Dam was a byword in the city at one time. The man in the street spoke of it with derision, but the work went on just the same, and there it is, one of the great dams of the world, and also one of the most scientifically and economically-constructed dams ever built.

The following are some comparative figures of great dams in different parts of the world:—

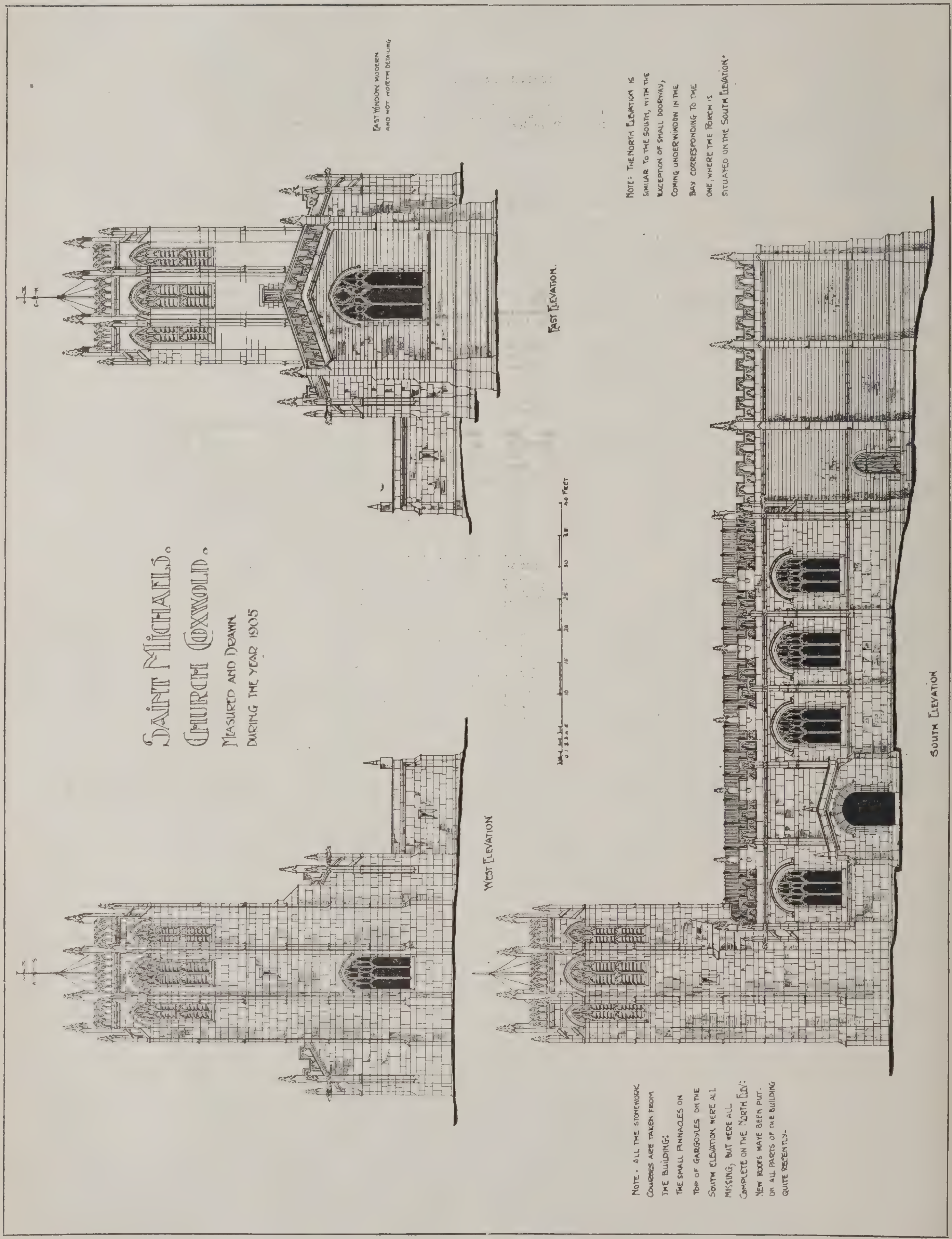
	Height	Reservoir Area	Storage capacity
	ft.	Acres	Millions of gallons
Sydney, Cataract... ...	154	2,145	21,411
Birmingham, Elan Valley (6 dams)	128	1,499	18,000
Liverpool, Lake Vyrnwy	85	1,115	12,000
Manchester, Thirlmere...	52	793	8,130
Bombay, Tausa	118	3,520	16,074
Coolgardie. W.A., Mundaring	100	800	4,600
Croton, New York ...	163	3,360	30,000

The height of dams given above is from the bed of river, not from foundation, which is in many cases a considerable depth below river bed.



The church is in the Perpendicular style and stands on an eminence at the top of a sloping village street. It comprises a chancel, nave, south porch and a fine octagonal west tower. This tower is quite unique amongst the small village churches of Yorkshire and is a very pleasing feature. The chancel was rebuilt in 1777 and the east window was inserted in 1889. All the windows in the nave appear to have been inserted at a later date than the original building, but they contain a large amount of ancient stained glass. The sides of the chancel are occupied by monuments of the Belasyse family, and Barons, Viscounts and Earls of Fauconberg. The most ancient is the Jacobean altar tomb of Sir William Belasyse (dated 1603), constructed of stone, wood and lead. There are two others in white marble which date back to 1652 and 1700. Laurence Sterne, the famous author of "Trirtam Shandy," &c., was vicar of this church from 1760 until his death in 1768. The measured drawings here reproduced are by Mr. William Whitehead, of Leeds.

MEASURED AND DRAWN BY WILLIAM WHITEHEAD.


SAINT MICHAELS,
CHURCH COXWOLD.
MEASURED AND DRAWN
DURING THE YEAR 1905
EAST WINDOW MODERN
AND NOT WORTH DETAILING
EAST ELEVATION.
WEST ELEVATION
SOUTH ELEVATION
0 1 2 3 4 5 10 15 20 25 30 35 40 FEET
NOTE: THE NORTH ELEVATION IS SIMILAR TO THE SOUTH, WITH THE EXCEPTION OF SMALL DOORWAY, COMING UNDER WINDOW IN THE BAY CORRESPONDING TO THE ONE, WHERE THE PORCH IS SITUATED ON THE SOUTH ELEVATION.
NOTE - ALL THE STONEWORK COURSES ARE TAKEN FROM THE BUILDING; THE SMALL PINNACLES ON TOP OF GARGOYLES ON THE SOUTH ELEVATION WERE ALL MISSING, BUT WERE ALL COMPLETE ON THE NORTH ELEV: NEW ROOFS HAVE BEEN PUT ON ALL PARTS OF THE BUILDING QUITE RECENTLY.

MEASURED AND DRAWN BY WILLIAM WHITEHEAD.

TWO SOUTH AFRICAN BUILDINGS.

In the issue of the "South African Master-Builders' Federation Journal" for August, which has just reached us from the Cape, reports are given of two important South African buildings now in course of erection. These are the new University buildings at Cape Town, and the new Town Hall at Durban, both of which, it will be remembered, were the subjects of open competition. The architects of the

Cape University Buildings

are Messrs. W. Hawke, F.R.I.B.A., and W. M. M'Kinlay, whose selected design was given in our issue for May 27th, 1903. It appears that the scheme is not at present to be carried out in its entirety, which is to be regretted. The contractors are Messrs. F. B. Smith & Sons, whose tender was selected out of 23 sent in. Latterly the building has not made much progress, but it is expected that the portion first to be completed will be ready about the end of this year. The building occupies a valuable site fronting Queen Victoria Street, and when completed will have as its central feature a great hall (half a circle on plan) with an internal diameter of 105ft. and a height of 56ft. After extensive enquiry, it was decided that South African stone should be used for the exterior. The base, therefore, is of Paarl granite and the superstructure of Flatpan stone from the Orange River Colony. The roofs are to be covered with Spanish tiles and the dome with copper.

The New Town Hall at Durban

is not far above ground level yet. The building is to have a steel frame and the steelwork will be carried out by a local firm, Messrs. Charles Wade & Sons. For the past month the stonework has been at a standstill, owing to insufficient supply, but by this time it will have been begun again. There is, too, a shortage of labour, which delays the construction.

Obituary.

Lieut.-Col. J. Gale, F.R.I.B.A., died recently. He was one of the oldest members of the Institute, and designed some of the first of the London Board Schools; also St. Luke's Church and Schools, Bermondsey, and many warehouses, factories, &c. At one time he was in partnership with Mr. J. Alfred Gotch and Mr. A. J. Leighton.

Mr. James K. Bolton, architect, of Gravelly Hill, died recently as the result of injuries received at New Street Station, Birmingham. He was alighting from a moving train when he slipped and fell between the platform and the footboard. He was terribly injured, and died on the way to the hospital.

A new Village Library has just been completed at Llantwit-Vardre, Pontypridd, from designs by Mr. Arthur L. Thomas, architect, of Pontypridd. The builders were Messrs. Price Brothers, of Cardiff. The cost of the library was £1,700.

A new Harbour at Southwold is to be constructed. The total cost will be £45,000, towards which the Treasury has made a grant of £15,000. The existing piers, which practically form the harbour, are to be extended 340ft., and there is to be a uniform depth of water of 40ft. on the north side of the harbour. There will be a concrete quay 1,000ft. long, and behind this the pickling plots.

Current Market Prices.

FORAGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	14	0	1	16	0
Clover, best...	per load	4	4	0	4	15	0
Hay, good	do.	3	17	6	4	2	6
Sainfoin mixture	do.	4	0	0	4	7	6
Straw...	do.	1	8	0	1	14	0

MISCELLANEOUS.

Bricks Stocks, d/d to job	per 1,000	1	15	0	—		
Do. Flettons on rail ...	do.	1	5	0	—		
Do. Pressed Wire Cuts, d/d to job ...	do.	1	17	0	—		
Do. Blue brindled wire cuts	do.	1	2	0	—		
Do. do. wire cuts ...	do.	1	6	0	—		
Do. do. pressed facings	do.	1	17	6	—		
Coke Breeze, into carts at gasworks ...	per load	0	2	0	—		
Do. d/d to job	do.	0	4	0	—		
Sand	per yard	0	7	6	—		
Ballast	do.	0	6	6	—		
Granite Chippings ...	do.	0	10	6	—		
Do. do. ¼in. ...	do.	0	11	6	—		
Do. Broken, 1½in. ...	do.	0	15	6	—		
Do. do. 2in. ...	do.	0	15	0	—		
Do. do. 2½in ...	do.	0	14	6	—		
Do. Kerb, Norwegian 6×12 and 12×6 in river	per foot	0	1	2	—		
Do. do. do. circular	do.	0	1	5	—		
Do. do. do. 12×8 in river	do.	0	1	5	—		
Do. do. do. circular	do.	0	1	8	—		
Do. do. Guernsey 6×12 in river	do.	0	1	4	—		
Do. do. do. circular	do.	0	1	6	—		
Do. do. do. 12×6 do.	do.	0	1	6	—		
Do. do. do. do.	do.	0	1	8	—		
Do. do. do. 18×8 do.	do.	0	1	8	—		
Do. do. do. do.	do.	0	1	10	—		
Do. Pitchings, Norwegian, 3×6	per ton	1	8	0	—		
Do. do. do. 3×7	do.	1	10	0	—		
Do. do. do. 3×5	do.	1	9	0	—		
Do. do. do. 4×5	do.	1	8	0	—		
Do. do do. 4×4	do.	1	13	0	—		
Do. do. do. 4×6	do.	1	5	0	—		
Do. do. do. 5×6	do.	1	4	0	—		
Do, do. do. 5×7	do.	1	4	0	—		
Do. do. do. Special, 4×6	do.	1	11	0	—		
Do. do. do. do. 5×7	do.	1	18	0	—		
Do. do. Guernsey, 3×6	do.	1	10	0	—		
Do. do. do. 3×7 & 3×9	do.	1	8	6	—		
Do. do. do. 3×5	do.	1	10	0	—		
Do. do. do. 4×5	do.	1	10	0	—		
Granite, Pitchings, Guernsey, 4×4	do.	1	13	0	—		
Do. do. do. 4×6	do.	1	9	0	—		
Do. do. do. 4×7	do.	1	6	6	—		
Do. do. do. 5×6	do.	1	6	0	—		
Do. do. do. 5×7	do.	1	5	0	—		
Do. do. Specials add.	do.	0	6	0	—		
Glass, English Sheet, in crates of stock sizes, 15oz., 2nds	per sq. ft.	0	0	3½	—		
Do. do. do. do. 3rds.	do.	0	0	2½	—		
Do. do. do. 21 oz. 2nds	do.	0	0	5	—		
Do. do. do. do. 3rds	do.	0	0	3½	—		
Do. do. do. 26 oz. 2nds	do.	0	0	6	—		
Do. do. do. do. 3rds	do.	0	0	4½	—		
Do. do. do. 32 oz. 2nds	do.	0	0	8	—		
Do. do. do. do. 3rds	do.	0	0	6	—		
Do. English patent plain rolled plate in stock crates ⅛	do.	0	0	2	—		
Do. do. do. 3/16	do.	0	0	2¼	—		
Do. do. do. ¼	do.	0	0	2½	—		
Do. Atter (Abo.) do. & White, Inf. 5th, 3×8	do.	8	10	0	—		
Do. do. (do.) Yellow, unsorted, 3×9	do.	9	10	0	—		
Do. Constantza, White, 3rd, 3×11	do.	9	10	0	—		
Cement	per ton	1	12	0	—		
Lime	do.	1	4	0	—		
Castor Oil, French ...	per cwt.	1	10	0	1	2	0
Colza Oil, English ...	do.	1	8	6	—		
Copperas	per ton	2	0	0	—		
Lard Oil	per cwt.	2	15	0	2	17	0
Lead, white, ground, carbonate	per ton	16	0	0	—		
Do. red	do.	15	0	0	19	0	0
Linseed Oil, barrels ...	per cwt.	1	0	6	—		
Petroleum, American ...	per gal.	0	0	6⅜	0	0	6½
Do. Russian ...	do.	0	0	5⅞	0	0	6
Pitch	per barrel	0	9	0	—		
Shellac, orange	per cwt.	10	15	0	10	16	0
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Town	per cwt.	1	7	6	1	8	6
Tar, Stockholm	per barrel	1	5	0	—		
Turpentine	per cwt.	2	7	0	—		

METALS.

		£	s.	d.	£	s.	d.
Standard Copper	per ton	85	0	0	85	10	0
Do. Strong sheets ...	do.	96	10	0	97	0	0
Lead, soft foreign	do.	17	0	0	17	10	0
Do. English	do.	17	10	0	18	0	0
Do. pipes...	do.	20	10	0	21	0	0
Do. sheets	do.	19	15	0	20	0	0
Galvanised Corrugated sheets	per ton	12	10	0	12	12	6
Spelter G.M.	do.	27	5	0	27	10	0
Angles, Scotland	do.	6	15	0	6	17	6
Bars, do.	do.	7	15	0	7	17	6
Marked bars, Staffs. ...	do.	8	10	0	8	12	6
Common bars, do. ...	do.	6	5	0	6	7	6
Angles, M'boro.	do.	6	10	0	6	12	6
Joists do.	do.	6	5	0	6	7	6
Angles, Midlands	do.	6	12	6	6	15	0
Joists do.	do.	6	17	6	7	0	0
Girder plates, Midlands ...	do.	7	7	6	7	10	0
Angles, Foreign, c.i.f. Thames	do.	6	7	6	6	10	0
Tees do. do. do.	do.	6	10	0	6	12	6
Joists, do. do. do.	do.	6	2	6	6	4	0
Channels do. do. do.	do.	6	7	6	6	8	6
Plates do. do. do.	do.	6	17	6	7	2	6
Tin, Foreign	do.	183	0	0	183	10	0
Do. English ingots ...	do.	183	10	0	184	0	0
Zinc, sheets, Silesian ...	do.	27	0	0	27	10	0

TIMBER.

Deals, Archangel Yellow (Tchoodinoff's) 2nd, 4×9	per std.	16	10	0	—
Do. do. do. 3rd, 4×9	do.	12	5	0	—
Do. Asbacka, Yellow, 4th, 3×9	do.	10	10	0	—
Do. Nederkalix, Yellow, 1st, 2½×7	do.	11	0	0	—
Do. do. do. 2nd, 2½×7	do.	10	5	0	—
Do. St. Petersburg, White, 3rd, 3×9	do.	9	0	0	—
Do. do. Yellow, 3rd, 2½×7	do.	9	10	0	—
Do. Skelleftea, Yellow, 5th, 3×9	do.	9	15	0	—
Do. Rafso, Yellow, 4th, 2½×7	do.	9	5	0	—
Battens, Dram, Yellow (planed) unsorted, 1×9	do.	8	15	0	—
Do. Fredriksstad, Yellow (planed), 3rd, ⅞×9	do.	9	0	0	—
Do. do. do. do. ⅝×9	do.	9	15	0	—
Do. do. do. unsorted 1×9	do.	9	10	0	—
Do. Hudikswall, Yellow, Inf., 5th, 2×7	do.	8	15	0	—
Do. Raumo, Yellow, 1st & 2nd, 2×4	do.	10	0	0	—
Do. Oscarshamn, Yellow, 1st & 2nd, 2×9	do.	9	0	0	—
Do. do. do. do. 2×8	do.	9	5	0	—
Do. do. do. do. 2×7	do.	9	5	0	—
Do. St. Petersburg, Yellow, 3rd, 2½×6½	do.	8	10	0	—
Do. do. do. do. 2½×6	do.	8	10	0	—
Do. do. do. do. 2×5	do.	9	0	0	—
Do. do. White, 3rd, 2×9	do.	9	10	0	—
Do. Skelleftea, Yellow, 2nd, 2×8	do.	9	10	0	—
Do. Saudo, White, 1st & 2nd, 2×4	do.	9	5	0	—
Do. Sornas, Yellow, 1st & 2nd, 2×4½	do.	9	0	0	—
Do. Sandarne, White, 1st, 1×9	do.	10	15	0	—

Bankruptcies.

Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—adjudication.

DURING THE WEEK ending August 31st, sixteen failures in the building and timber trades in England and Wales were gazetted.

J. T. WHITTOME, engineer, Tavistock. R.O., Aug. 20

J. JOHNSON, builder and decorator, Mitcham. R.O. Aug. 24.

O. ODELL, builder and contractor. P.E., St. Albans C.C., Oct. 23, at 10.30.

G. CROUCH, builder. Hockley, Birmingham. Liabilities, £1,201; assets, £498.

BROWN BROTHERS, builders and contractors, Pembroke Dock. Deficiency, £1,722.

A. R. E. TURNER, painter and decorator, Blackburn. Adj., July 21 (amended notice).

JOHN E. CLARK. LTD., builders' merchants, Finsbury Park. Liquidation left in hands of O.R.

HEAL & CO., builders, Bournemouth, P.E., Town Hall, Poole, Oct. 3, at 11.30. R.O., Aug. 20.

G. W. MASON, plumber and painter, Swadlincote P.E., Burton-on-Trent C.C., Oct. 17, at 12.

C. M. CHADWELL, civil engineer and contractor, Blackburn. P.E., C.C., Blackburn, Sept. 5, at 9.45.

PIGGOTT & WETTON, painters, grainers and paper-hangers, South Normanton. P.E., Derby C.C., Oct. 16, at 11.

F. W. PHILPOTT, builder, Canterbury. Unsecured liabilities £366; net assets £230. P.E., Guildhall, Canterbury, Sept. 13, at 10.

G. E. CROXSON, engineer, Southend-on-Sea. First meeting, 14, Bedford Row, London, W.C., Sept. 5, at 3. P.E., Shire Hall, Chelmsford, Oct. 3, at 10.

E. D. MULLINS & CO., LTD., builders' merchants, Loughborough. Total liabilities, £2,854; unsecured creditors, £1,988; nett assets, £2,555; deficiency, £599.

E. H. KEELING, plumber, glazier, painter and paper-hanger, Matlock Bridge. First meeting, O.R.'s, Derby, Sept. 5, at 11. P.E., Derby C.C., Oct. 16, at 11. R.O., Aug. 17.

F. P. BAINBOROUGH, journeyman plumber, Gainsborough. First meeting, O.R.'s, Lincoln, Sept. 6, at 12.30. P.E., Sessions House, Lincoln, Sept. 13, at 3. R.O., Aug. 20.

Complete List of Contracts Open.

WITH a few exceptions, news of Contracts Open are not repeated after they have been published once in these columns, so that readers will find particulars in our previous issues of other contracts that still remain open.

Unless expressly stated to the contrary, all deposits required for bills of quantities, &c., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair-wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

Sept. 6. Treforest.—*Additions to Castle Square English Congregational Church, Treforest,* for the Trustees. Plans and specification may be seen at the office of LL. Thomas, A.M.I.M.E., architect and engineer, Church Street Chambers, Pontypridd, to whom tenders are to be sent on or before Sept. 6.

Sept. 7. Buckingham.—*Repair of a Foot-Bridge* between Addington and Verney Junction, for R.D.C. Tender forms, with copy specification, can be obtained on application to Thomas R. Hearn, clerk, 26 West Street, Buckingham, to whom tenders must be sent not later than Friday, Sept. 7.

Sept. 7. Stockport.—*Erection of stables and coach-house, &c.,* at the Stepping Hill Hospital, Hazel Grove, near Stockport, in accordance with plans and specification, &c., prepared by W. H. Ward, architect, Paradise Street, Birmingham. Plans and specification may be seen of C. F. Johnson, clerk to the Guardians, Union Offices, Stockport, or upon application to Mr. Ward during the usual office hours. Forms of tender, with copies of bills of quantities, will be sent to contractors upon application to C. F. Johnson, enclosing cheque for £2 2s. Sealed tenders are to be sent to C. F. Johnson not later than 10 a.m. on Sept. 7. Fair wages clause

Sept. 8. Gressenhall.—*Seven new windows and work in connection therewith* at Gressenhall Workhouse, for the Mitford and Launditch Union, in accordance with specifications, which may be inspected at any reasonable time at the Workhouse. Tenders, marked "Windows," should be sent to W. M. Barton, clerk to the Guardians, the Guildhall, East Dereham, on or before Sept. 8.

Sept. 8. Reigate.—*Erection of cart sheds and a store at the Corporation depôts in Brighton Road, Redhill, London Road, and Blackborough Road, Reigate,* all in the Borough of Reigate, in accordance with plans, sections, general conditions, and specification prepared by F. T. Clayton, C.F., the borough surveyor, which may be seen, and full particulars obtained, at his office at the Municipal Buildings, Reigate. The contractor whose tender may be accepted will be required to enter into a contract in writing, the form whereof may be seen of the Town Clerk, and himself and his surety or sureties will be required to enter into a bond for the due fulfilment of the contract. Sealed tenders, on forms which will be provided on application, giving the names and addresses of two sureties, are to be delivered to A. Smith, Town Clerk's office, Municipal Buildings, Reigate, endorsed "Tender for Cart Sheds," not later than noon of Sept. 8.

Sept. 8. Kea.—*Erection of a stable at Calenick Farm,* in the parish of Kea, in the occupation of the executors of T. Thomas. Plans, conditions, and specifications can be seen at the farm house at Calenick. Tenders should be sent on or before Sept. 8 to G. Gow, Tregothnan Office, Truro.

Sept. 8. Derby.—*Erection of a new school* on a site between Clarence and Porter Roads. Plans, specfications, and conditions of contract may be seen and schedules of quantities may be obtained, on application to Hunter and Woodhouse, All Saints' Chambers, Iron Gate, Derby. The sum of £1 1s. will be charged for the schedule of quantities. Tenders on the form supplied, together with the priced schedule of quantities, must be delivered at the Education Office, Becket Street, Derby, before 12 o'clock at noon on Sept 8, endorsed "Tender for New School on Clarence Road." Fair wages clauses. Tenders will be accepted from Derby firms only.

Sept. 8. Glamorgan.—*1. New Police Station at Glyn-Neath. 2. Alterations and additions at the Bridgend Police Court buildings* for the Standing Joint Committee of the Glamorgan Quarter Sessions and C.C. Plans and specifications of the respective works may be seen and copies of the bills of quantities obtained at the following places:—Work No. 1, at the county police station, Neath; work No. 2, at the county police station, Bridgend; and for each of the works at at these offices. Fair wages clause. Sealed tenders are to be delivered to T. M. Franklen, clerk of the County Council, Glamorgan C.C. offices, Westgate Street, Cardiff, together with the full names and addresses of two substantial sureties, not later than Sept. 8, marked outside "Tender for Glyn-Neath Police Station," or "Tender for Alterations to Bridgend Police Court Buildings," as the case may be.

Sept. 10. Seldown, Poole.—*Erection of a secondary school* at Seldown, Poole. Plans and specifications may be seen at the office of W. Andrew, architect, Parkstone. Tenders are to be delivered at the office of C. Lisby, secretary, Fish Street, Poole, not later than noon, Sept. 10.

Sept. 10. Alnwick.—*Erection of branch premises at Alnwick* for the Amble Co-operative Society, Ltd. Quantities can be obtained upon application to E. G. Ekins, architect, Co-operative Wholesale Society, West Blandford Street, Newcastle-on-Tyne. Tenders, endorsed "Alnwick New Building," will be received at the society office, Queen Street, Amble, up to 12 o'clock noon, Sept. 10.

Sept. 10. Dublin.—*Workmen's dwellings in Townsend Street,* in accordance with the plans, specification, and conditions of contract prepared by the City Architect, which may be inspected daily (except on Saturdays) at the Municipal Building, Cork Hill, Dublin, between the hours of 11 a.m. and 4 p.m. No tender will be entertained which is not on the prescribed form. Copies of bills of quantities and forms of tender may be obtained from the City Treasurer, Municipal Buildings, Cork Hill, Dublin, on payment of £2. Tenders must be accompanied by the priced bills of quantities (priced in ink), and must also contain the names of two solvent sureties willing to be bound severally with the contractor for the due performance of the contract in a sum of one-fifth of the amount of the contract price. Tenders under seal addressed to the "Chairman, Improvements Committee," and endorsed "Tenders for the erection of Dwellings in Townsend Street," to be lodged at the Improvement Committee Office, City Hall, Dublin, not later than 4 o'clock on Sept. 10. Contractors will be required to agree to the condition that no tender shall be amended or withdrawn before the expiration of a period of two months from the date of delivery to the Corporation. The work to be executed under this contract shall be done entirely by local labour, and where this is considered impracticable the contractor is to apply to the Municipal Council for permission to have the work done by other than local labour, and the Council having considered the statements submitted by the contractor shall by resolution determine whether the work is to be done by local labour or otherwise. The contractor shall be bound by such resolution. Fair wages clause.

Sept. 10. Bury St. Edmund's.—*Alterations and additions to the County School,* Northgate Street, Bury St. Edmund's, for the West Suffolk Education Committee. Plans and specifications can be seen at the Education Offices, 5, Crown Street, Bury St. Edmund's, or at the offices of the County Architect, A. Ainsworth Hunt, Sudbury and Bury St. Edmund's. Tenders, sealed and endorsed, to be delivered to F. R. Hughes, secretary to the Education Committee, 5, Crown Street, Bury St. Edmund's, on or before Sept. 10.

Sept. 10. Salford.—*Extensions to car depot and workshops* for the Tramways Committee. Contract 145, constructional steelwork; contract 146, builders' work, in their erection and completion of extensions to the Central Car Depot, Frederick Road, Pendleton. Forms of tender and bills of quantities for either contract may be obtained on application to the General Manager, Tramways Department, 32, Blackfriars Street, Salford, upon depositing a cheque for £2 2s. Plans can be inspected and further particulars obtained at the above-mentioned offices. Tenders endorsed "Steelwork" (or "Buiders' Work" as the case may be) "Car Depot Extensions," and addressed to the Chairman, Tramways Committee, Town Hall, Salford, must be delivered to L. C. Evans, town clerk, Town Hall, Salford, not later than 3 p.m. on Sept. 10.

Sept. 11. Manchester.—*Execution of alterations at the Benton Technical Institute* for the Lancs. Education Committee. The plans may be seen and bills of quantities obtained at the offices of J. W. Beaumont & Son, 10, St. James's Square, Manchester. Tenders must be delivered before 12 o'clock noon on Sept. 11, sealed and endorsed, to W. F. Knott. Parish Offices, Ashton-under-Lyne.

Sept. 11. Audenshaw.—*Erection of a new public elementary school* at Audenshaw. The plans may be seen and bills of quantities obtained at the office of Henry Littler, county architect, 16, Ribblesdale Place, Preston, by payment of a deposit of £2. Tenders must be delivered before 12 o'clock noon on Sept. 11, sealed and endorsed, to W. F. Knott, Parish Offices, Ashton-under-Lyne.

Sept. 11. Crewe.—*Making of the back passages leading from Walthall Street to Westminster Street, and behind Lewis Street,* within the borough, in accordance with plans, sections and specifications, which may be seen and all other necessary information obtained upon application to G. E. Shore, borough surveyor, Earle Street, Crewe. The contractor must provide the whole of the materials required in the making of the above passages. A deposit of £1 will be required. Sealed tenders and schedule of prices, upon printed forms to be obtained from the Borough Surveyor, must be delivered to F. Cooke, town clerk, Municipal Offices, Crewe, not later than nine o'clock in the forenoon of September 11, endorsed "Tender for Back Passage Making." No tender will be accepted unless made out on the printed form above named, with all the items in the schedule of prices fully priced.

Sept. 11. Gravesend.—*Erection of a registrar's room* at Gravesend Hospital. Plan and specification may be seen on application to the secretary at the hospital. Tenders must be sent in not later than 4 p.m. on Tuesday, Sept. 11.

Sept. 11. London, N.—*1, General exterior repairs, cleaning, painting, &c.; 2* (a), *Repairs to roof of laundry building, and, alternately* (b) *construction of new roof altogether,* for the Guardians of the Poor of the Strand Union at their workhouse at Upper Edmonton, near Silver Street Station (G.E.R.). Plans and specifications may be inspected at the offices of the Architect to the Guardians, A. A. Kekwick, 18 and 19, The Outer Temple, Strand, between the hours of 11 and 4 o'clock (Saturday excepted), or at the workhouse at Edmonton. Separate tenders, sealed and endorsed, "General Repairs, Edmonton," "Repairs to Laundry Roof," or "New Roof to Laundry," as the case may be, are to be delivered at 15, Henrietta Street, Covent Garden, W.C., by 4 p.m. on Sept. 11.

Sept. 12. York.—*Erection of a new club house,* for the York Golf Club. Drawings and specifications may be inspected at the offices of Mr. J. Edmund Jones, solicitor, 1, Market Street, York, between the hours of 10 a.m. and 5 p.m. Tenders (on the form supplied) are to be addressed and delivered to the Chairman, York Golf Club Committee, 1, Market Street, York, on or before Wednesday, Sept. 12, sealed and endorsed "Tender for New Golf Club House."

Sept. 12. Merthyr Tydfil.—*Additions and improvements* to Bethesda Congregational Chapel, Merthyr Tydfil. The plans and specifications can be seen with Mr. Rees Jones, grocer, Bethesda Street. The tenders to be sent, sealed and endorsed, to J. Thomas, 90, Brecon Road, Merthyr Tydfil, not later than Sept. 12.

Sept. 13. Chartham Hatch.—*Alteration and enlargement, to accommodate 40 additional children of the Council School at Chartham Hatch,* near Canterbury, Kent. Drawings and specifications may be inspected at the office of W. J. Jennings, architect, 4, St. Margaret's Street, Canterbury. Any person desiring to tender and to receive copy of bills of quantities must send his name to the architect, together with a deposit of £1, not later than noon on September 4. Tenders on the form supplied to be delivered to F. S. Cloke, Sandwich, Kent, not later than noon on September 13.

Sept. 13. Hatton.—*Supply of building materials* for the ensuing twelve months, from Oct. 1, 1906, to Sept. 30, 1907, at the Warwick County Lunatic Asylum, at Hatton, near Warwick, where forms of tender may be obtained, and samples of materials seen, after Sept. 6. Tenders to be sent in by Sept. 13.

Sept. 14. Cambridge.—*Alterations and Additions* to "The Green Man" Inn, Six Mile Bottom, near Cambridge, for General Municipal Charities Trustees of the City of Coventry. Particulars and quantities may be obtained on application to Herbert W. Chattaway, Surveyor to the Trustees, Trinity Churchyard, Coventry, to whom tenders must be delivered not later than 10 o'clock Friday, Sept. 14.

Sept 14. Low Bradfield.—*Additions, &c., to Low Bradfield Provided School, near Sheffield,* for the West Riding Education Committee. Plans may be seen and quantities obtained on application to J. Vickers-Edwards, county architect, County Hall, Wakefield. Sealed tenders, properly endorsed, to be sent to him not later than 10.30 on the morning of Sept. 14.

Sept. 14. Harthill-with-Woodall, West Riding.—*Erection of a new cloakroom at Harthill-with-Woodall* Provided School for the West Riding County Council. Plans may be seen and quantities obtained on application to J. Vickers Edwards, county architect, County Hall, Wakefield. A deposit of £1 is required, which will be returned on receipt of a *bona fide* tender. Cheques to be sent to the West Riding Treasurer, County Hall, Wakefield. Sealed tenders, properly endorsed, to be sent to the County Architect, not later than 10.30 on the morning of Sept. 14.

Sept. 14. Wakefield, West Riding.—*Different works in connection with the following schools:*—Thornton-in-Craven new School, Elslack new School, Cudworth new School, Kirkhamgate new School, Bolton-on-Dearne (Goldthorpe, Infants), Provided School (enlargement), Mytholmroyd (Scout Road Provided School, sanitary alterations), Mytholmroyd (Burnley Road Provided School, sanitary alterations), Mytholmroyd (Cragg Vale Provided School, sanitary alterations—builder and plumber), Harthill-with-Woodhall Provided School (alterations and new cloakroom—builder, &c.), Adwick-on-Dearne Provided School (alterations and repairs—builder and asphalter), for the West Riding C.C. Education Committee. Plans may be seen and quantities obtained on application to J. Vickers Edwards, county architect, County Hall, Wakefield. A deposit of £1 is required for each of the above schools. Cheques to be sent to the West Riding Treasurer, County Hall, Wakefield. Sealed tenders, properly endorsed, to be sent to the County Architect not later than 10.30 on the morning of Sept. 14.

Sept. 15. Hounslow.—*Erection of a new infants' school at Spring Grove,* to accommodate 350 children, for the Heston and Isleworth U.D. Education Committee. The plans may be inspected at the office of A. Lang, architect, Council House, Hounslow, where also bills of quantities may be obtained, together with specification and form of tender, on payment of a deposit of £2 2s. Tenders on the forms supplied, to be delivered to H. J. Baker, clerk to the committee, Council House, Hounslow, not later than 12 noon on Sept. 15, endorsed "Tender for Spring Grove Infants School."

Sept. 17. Gainsborough.—*Pulling down and rebuilding premises in Bridge Street,* Gainsborough, belonging to the Gainsborough Industrial Co-operative Society, Ltd. Bills of quantities and form of tender may be had on application to Scorn and Gamble, architects, Bank Street Chambers, Lincoln, on or before Sept. 5 and on payment of £2 2s. The drawings and conditions of contract may be inspected at the offices of the architects. Tenders must be delivered to the manager at the office of the Society, 11, Bridge Street, Gainsborough, and in the envelope provided for the purpose, before 10 a.m. on Sept. 17.

Sept. 18. London, S.E.—*Erecting a public convenience and bath houses* at Bell Green, Lower Sydenham. Drawings, specification, and form of contract can be seen, and a copy of the drawings, specification, and form of tender may be obtained at the Town Hall, Catford (Surveyor's Department), on payment of a deposit of £5. The tenders must be on forms issued by the Council, enclosed in an envelope, sealed and endorsed "Tender for Convenience and Bath Houses," and must be delivered by 4 o'clock on Sept. 18 at the Town Hall, and placed in the box there provided for the purpose. The work must be proceeded with immediately on obtaining the Borough Surveyor's order to commence the work, and the contractor must employ local labour as far as practicable in carrying out the work. Fair wages clause.

Sept. 19. Rotherham.—*Laundry machinery and fittings required at the Public Baths; also* *structural alterations.* Plans and specifications may be seen and further particulars obtained on applying at the offices of J. Platts, Corporation architect. Tenders endorsed "Laundry Machinery for Baths" to be sent to W. J. Board, town clerk, Town Hall, Rotherham, not later than Sept. 19. Fair wages clause.

Sept. 19. Leeds.—*Enlargement of the branch post office, Chapeltown, Leeds.* Drawings, specification, and a copy of the conditions and form of contract may be seen on application to the Postmaster. Bills of quantities and forms of tender may be obtained at H.M. Office of Works, etc. on payment of £1 1s. Tenders must be delivered before twelve o'clock noon on September 19, addressed to the Secretary, H.M. Office of Works, etc., Storey's Gate, London, S.W., and endorsed "Tender for enlargement Chapeltown Branch Post Office, Leeds."

Sept. 24. Raskelf.—*Erection of a farm house* at Cold Harbour, Raskelf, near Easingwold, for the Ecclesiastical Commissioners. Plans and specifications may be seen and quantities obtained with Thomas Stokes, architect, Thirsk, to whom tenders must be delivered not later than 10 a.m. on Sept. 24.

Sept. 27. London, E. — *Additions and alterations in the building at the Electricity Works*, Osborn Street, Whitechapel, E. Persons tendering must submit the names and addresses of two substantial persons willing to be jointly and severally bound for the due and proper performance of the contract. Fair wages clause. The drawings may be seen and copies of the stipulations, specification, schedule, and form of tender may be obtained by applying to M. W Jameson, A.M.Inst.C.E., borough engineer, 15, Great Alie Street, Whitechapel, E., between the hours of 10 a.m. and 12 noon, upon paying £5. Tenders, endorsed "Tenders for Additions to Electricity Buildings," should be sent to G. W. Clarke, town clerk, 15, Great Alie Street, Whitechapel. E., in the envelopes supplied, so as arrive at this office on before 12 o'clock noon on Sept. 27.

Oct. 2. Christiania, (Norway)—*Supply and erection of a signal and point lever box at Hundalen station* on the Ofoten railway (one of the Norwegian State Railways). Tenders through agent residing in Norway to be delivered not later than Oct. 2. Apply, 10 kr. deposit, "Driftsbestyrerens Kontor, Narvik."

Oct. 4. Levenshulme. — *Erection of new Technical School*, at the rear of the Chapel Street Council School, Chapel Street, Levenshulme. Specifications, bills of quantities, and further particulars may be obtained on application to the architect, Mr. Henry Littler, 16, Ribblesdale Place, Preston, on payment of £3 3s., which will be returned on receipt of a *bonâ fide* tender. Tenders, endorsed "Tender for new Technical School," to be sent on or before Oct. 4, to J. Ogden Hardicker, clerk, Northern Assurance Buildings, Albert Square, Manchester.

No date. Llanon.—*Erection of new offices and other work* at the Llanon Council School. Full particulars can be obtained on application to the headmaster, or to G. Dickens-Lewis, county architect, Aberystwyth.

No date. Swansea.—*Rebuilding of the White Hart Hotel, Oxford Street and Union Street.* Persons desirous of tendering should send their names for bills of quantities to J. H. Morwood, architect, Welwyn Lodge, Mackworth Terrace, Swansea.

No date. Leeds.—*Erection of six scullery houses* on the White Horse estate, York Road, Leeds. For plans, &c.. apply to T. Hall, builder, 3, Hanover Place, Park Lane, Leeds.

No date. Castlecomer (Co. Kilkenny).—*Erection of a house* (bricklaying only). All materials supplied. Contractor to find his own labourers. Plans can be seen with Mr. William Dobbs, Estate Office, Castlecomer

No date. Pannal.—*Erection and completion of a new house*, Hill Foot, Pannal, for A. Rushworth, Esq. Contractors are requested to send in their names to R. Crosland, architect, 10, James Street, Harrogate, and quantities will be forwarded when ready.

No date. Bristol.—*New warehouses upon the Bath Road*, Bristol. Quantities can be obtained and plans and specifications inspected upon application to J. Harding & Son, architects and surveyors, Salisbury.

No date. Swadlincote. — *Erection of a free library at Swadlincote* for the U.D.C. Plans and specifications may be seen, and quantities and particulars obtained, at the office of A. Macpherson, Esq., architect, 16 Tennant Street, Derby, on payment of deposit of £2 2s.

No date. Chesterfield.—*Erection and completion of four new cottages and two shops*, Durrant Road, Chesterfield. Contractors can see plans, and obtain bills of quantities and all further information at the offices of W. C. Jackson, M.S.A., architect and surveyor, 29, Knifesmith Gate, Chesterfield.

ENGINEERING.

Sept. 7. Newcastle-on-Tyne.—*Boilers, laundry fittings, heating, &c.*, required in the extensions to the City Hospital for Infectious Diseases, Walker Gate, for the Sanitary Committee. Plans may be seen, and specifications, bills of quantities, and forms of tender obtained at the City Property Surveyor's Department, Town Hall, Newcastle-upon-Tyne, on payment of £1 1s. to the City Treasurer. Sealed tenders addressed to the "City Property Surveyor," and endorsed "Tender for Boilers, Heating, &c., at City Hospital," must be delivered at his office, Town Hall, before 10 a.m. on Sept. 7.

Sept. 10. London, N.W.—*Laying and jointing, &c., of 42in. and other cast-iron pipes* between Child's Hill and Cranley Gardens, and other necessary work in connection therewith for the Metropolitan Water Board. Forms of tender, with schedule and conditions of contract, may be obtained, and drawings inspected, upon application to the Engineer, at "The Firs," Southern Road, Fortis Green, East Finchley, N., between the hours of 10 and 4 (except on Saturdays). Tenders, enclosed in sealed envelopes, addressed to the Clerk of the Board, and endorsed "Tender for Pipelaying, &c., Child's Hill to Granley Gardens," must be delivered at the offices of the Board not later than 10 a.m. on Sept. 10

Sept. 10. Alsager.—*Continuation of the boring down to the water-bearing strata at the Pumping Station, Alsager*, for the U.D.C. Specifications can be seen and forms of tender obtained by competent well sinkers only, of J. J. Nelson, clerk to the Council, Burslem, upon a deposit of £1 1s. Sealed tenders to be delivered to the Clerk not later than Sept. 10.

Sept. 12. Ebbw Vale.—*Repairing one of the filter beds* at the Ebbw Vale U.D.C. Llangynider waterworks. Plan and specification may be seen and form of tender with bill of quantities obtained by appointment at the office of T. J. Thomas, engineer, District Council Office, Ebbw Vale. A deposit of 10s., which must be in postal orders, will be required from each person who obtains a copy of the form of tender and bill of quantities. Tenders enclosed in a sealed envelope, endorsed on the outside, "Tender for Repairing Filter Bed," must be delivered to T. Hughes, clerk, Ebbw Vale, not later than Sept. 12.

Sept. 13. London, S.E.—*Provision and erection of iron bridges and connecting up same between A and E blocks at the Workhouse, Ladywell, S.E.*—Persons desirous of tendering may obtain specification and printed forms of tender (which can only be received), containing full particulars and conditions, from the Office of E. P. Fenton, clerk, Parish of Bermondsey Guardians' Offices, 283, Tooley Street, S.E., between the hours of 10 a.m. and 12 noon daily, on depositing a £5 Bank of England note. Sealed tenders, endorsed "Tender for Bridges, Ladywell Workhouse," must be delivered to the Clerk personally, not later than 6.30 p.m. on Sept. 13, and the tender will be opened and considered at 7 p.m., at the meeting of the Guardians to be held the same day, at which date, time, and place a responsible member of the firm tendering must be in attendance.

Sept. 14. Buckie.—*Providing an increased and improved water supply to the Burgh.* Copies of the drawings may be seen here, and also in the office of Sir W. R. Copland, C.E., 146. West Regent Street, Glasgow; and copies of specification and duplicate copies of schedule of quantities may be obtained on payment of a fee of £1 1s. An assistant engineer will meet contractors at the Commercial Hotel, Buckie, on Saturday, September 8, at 11 a.m., and will show them over the ground. Sealed offers, endorsed "Tender for Water Works," to be addressed to J. L. M'Naughton, town clerk, Burgh Chambers, Buckie, and lodged with him by 12 noon on Friday, Sept. 14.

Sept. 17. Hull.—*Diversion of the passenger lines for a distance of about 1 mile, and the construction of a group of marshalling sidings at Dairycoates*. Hull, for the Directors of the North Eastern Railway. Plans may be seen, and specification, detailed quantities, and form of tender obtained, on personal application at the office of W. J. Cudworth, the company's engineer, at York. Sealed tenders, maaked "Tender for Dairvcoates New Sidings," to be sent to the secretary at York not later than noon on Sept. 17.

Sept. 19. Leigh-on-Sea.—*Carting, excavating for, laying, jointing, and completing 776 lin. yards or thereabouts of 4ins. dia. and 100 lin. yards of 3 ins. dia. cast-iron gas mains* for Hadleigh Road, Station Road, and Victoria Drive, for the U.D.C. Gas Department. Quantities may be obtained and plans and specifications seen on application to J. W. Liversedge, C.E., Surveyor to the Council. Tenders to be signed, sealed, and delivered to the Council, Carlyle Croasdell, on or before Sept. 19, endorsed "Tender for Gas Mains."

Sept. 27. Pentre, Rhondda.—*Steel work of a road bridge of 19ft. span and 35ft. in width*, erected complete in Bailey Street, Ton Pentre, near Ystrad Station. Tenders must be received not later than Sept. 27. Forms of tender and plans may be obtained on application to W. J. Jones, engineer and surveyor, at the Council Offices, Pentre, Rhondda, on deposit of £1 1s.

No date. Patley Bridge. Leeds.—*Heating Middlesmoor Parish Church.* For particulars apply, Vicar, Middlesmoor, Patley Bridge.

IRON AND STEEL.

Sept. 19. Leigh-on-Sea.—*Supply and delivery of 22 tons or thereabouts of 4in. diam. and 3in. diam. cast-iron pipes and specials* for the U.D.C. Particulars may be obtained on application to J, W. Liversedge C.E., surveyor to the Council. Tenders to be signed sealed, and delivered to the Clerk to the Council, Carlyle Croasdell, not later Sept. 19.

PAINTING AND PLUMBING.

Sept. 7. Leeds.—*Painting and decorating* the Council Chamber, Town Hall, Leeds. Forms of tender, specification, and particulars may be obtained, and copies of the documents forming the contract may be inspected, at the City Engineer's office, on payment of a deposit of one guinea, which will be returned on receipt of a bona-fide tender. Tenders, properly endorsed, should be received at the Town Clerk's Office not later than 10 a.m. on Friday, Sept. 7.

Sept. 10. Milnthorpe.—*Outside painting* of Patton Hall Farm, Brackenthwaite Farm, near Milnthorpe, and four farms in Crook, for T. Newby-Wilson, Esq., J.P. Mr. S. Kellett, the steward, will attend at Brackenthwaite on Sept. 5, at 10.30 a.m., and at Sunny Brow, Crook, on Sept. 6, at 10.30 a.m., to point out the work. Tenders must be sent to him at Patton Hall, near Kendal, on or before Sept. 10.

Sept. 13. Manchester.—*Painting* at the Southern Cemetery and Moss Side, Helmet Street and George Street, Openshaw, recreation grounds, for the Parks Committee. Specifications may be obtained at the city architects' office, town hall, upon payment of one guinea each, which sum will be returned on receipt of a bona-fide tender. Separate sealed tenders, enclosed in the official envelopes, to be delivered at the above office not later than 9 a.m. on Thursday, Sept. 13.

Sept. 14. Chelmsford.—*Painting* the outside of house and premises, No. 10, Duke Street, Chelmsford, belonging to the Corporation. Particulars can be obtained and specification seen at the office of the Borough Surveyor, 16, London Road, Chelmsford. Tenders must be sent by Friday, Sept. 14, to Thomas Dixon, town clerk, Chelmsford.

Sept. 19. London, E.—*Staining and polishing the floors of the day rooms and dormitories at the* new schools at Hutton, Essex, for the Guardians of the Poplar Union, comprising a superficial area of between five and six thousand square yards. Quotations, at per square yard, should be sent in not later than 6.30 p.m. on Sept. 19 to G. H. Lough, clerk to the Guardians, Union Offices, 45, Upper North Street, Poplar, E.

No Date. Castleford.—*Painting, &c.*, at the Castleford Market Hall, in accordance with the quantities and specification prepared by Mr. W. Green, surveyor to the U.D.C., copies of which may be obtained on a deposit of £1 1s., which will be returned on receipt of a *bona-fide* tender.

ROADS AND CARTAGE.

Sept. 8. Carmavey.—*Making of a concrete walk and edgings* for the Committee of Carmavey Graveyard. Specification and plan can be seen at the caretaker's house. Tenders will be received up to Sept. 8, by W. P. Dickie, secretary, Ballysculty Muckamore.

Sept. 8. Chorlton-cum-Hardy.—*Several works required in making up Newport Road, Hartley Road, Lynton Road, Chepstow Road, Crescent Road*, Chorlton-cum-Hardy, for the Withington Committee. Plans, sections, and specifications of the work can be seen, and a form of tender, with quantities, and any further information obtained from the surveyor to the Committee, Town Hall, West Didsbury. Tenders to be endorsed "Tenders for Street Works," and to be addressed to the Chairman of the Withington Committee, Town Hall, West Didsbury, and delivered not later than noon on September 8.

Sept. 10. London, N.W.—*Works of kerbing, channelling, metalling, tar paving, gullies, and other works in fully making up the first portion of Stanley Road*, West Hendon. for the U.D.C. The drawings and specification may be seen and forms of tender obtained on application to S. S. Grimley, engineer and surveyor to the Council, at the Council Offices, Hendon, N.W., on deposit of £10. Sealed tenders, endorsed "Private Improvements," addressed to the Chairman of the Council, to be sent to H. Humphris, clerk to the Council, Council Offices, The Burroughs. Hendon, N.W., not later than 4 o'clock p.m. on Sept. 10.

Sept. 10. Morley.—*Improvement and widening of Wide Lane*, within the borough, including excavating, building a retaining wall, kerbing, flagging, and channelling. Plans and specifications may be seen, and bills of quantities obtained, on application to W. E. Putman, A.M.I.C E., borough engineer and surveyor, Town Hall, Morley. Tenders, sealed and endorsed "Wide Lane Improvement," must be delivered at the Town Clerk's Office, Town Hall Morley, not later than noon on Monday, Sept. 10.

Sept. 10. Seaforth.—*Following works in connection with the Seaforth Sanatorium to be erected on Brahan Estate, near Maryburgh*:—1. For formation of approach road and excavation of site for building. 2. Water supply from Somberby Well. 3. Sewerage drain and filter tank, &c. Plans and specifications to be seen with Ross & Macbeth, architects, Inverness, and tenders lodged with them on or before Sept. 10. The architects will be on the site at 11.30 a.m. on Sept. 5, to point out work to be done.

Sept. 10. Bishop's Stortford.—*Supply and delivery of a 10-ton steam road-roller* for the Urban District Council. Tenders, accompanied by a complete specification of the roller proposed to be supplied, and stating when it can be delivered, to be sent to T. Swatheridge, clerk, Council Offices, 7, North Street, Bishop's Stortford, by Sept. 10.

Sept. 10. London, N.—*Sewering, levelling, paving, metalling, kerbing, channelling, and making good avenue mews, Briston Grove, and Warner Road* (1st section), Hornsey. Forms of tender, &c., and particulars can be obtained from E. J. Lovegrove, borough engineer and surveyor, Municipal Offices, Highgate, on any morning between 10 and 12 o'clock. Tenders must be on the prescribed form, and delivered, or sent by post (sealed and endorsed), so as to be received in the Town Clerk's Office, 99, Southwood Lane, Highgate, N., by 4 p.m., Sept, 10. Quantities, duly completed, must accompany the tenders.

Sept. 10. Harpenden.—*Draining, levelling, paving, metalling, kerbing, channelling and making good Douglas Road, Harpenden*, for the Urban District Council. Plans, sections, specifications of works and materials, and general conditions may be seen between the hours of 9,30 and 10.30 a.m., and bills of quantities and forms of tender may be obtained on deposit of cheque for £1 1s. upon application to John H. Leverton, surveyor, the Public Hall, Harpenden. Sealed tenders, together with fully-priced quantities, endorsed "Tender for Private Street Works," to be delivered to C. S. Tuckey, clerk to the Council, High Street, Harpenden, before noon on Sept. 10.

Sept. 10. Batley.—*Levelling, paving, flagging, channelling, and completing of each of the following streets.*—Back Henrietta Street, Ambler Street, Villiers Street, Stralau Street, Prospect Street, Ings Road, and Prince Street, in the same Borough. Plans, sections, and specifications of the said works respectively may be seen on application to the Borough Engineer and Surveyor, O. J. Kirby, whose offices are at the Town Hall, Batley. Sealed tenders (on forms which may be obtained of the Borough Surveyor, properly endorsed, to be delivered to J. H. Craik, town clerk, Town Clerk's Office, not later than Sept. 10.

Sept. 11. Leeds.—*Paving and flagging the following streets*:—Hovingham Terrace, Hovingham Mount, Back Hovingham Terrace, Back Hovingham Mount, Back Dorset Road, Pasture Road, Shepherd's Place, Darfield Street, Darfield Place, Powell Street, Marley Grove, and Marley View. Drawings may be seen at the City Engineer's office, Municipal Buildings. Forms of tender and bills of quantities may be obtained, and copies of the documents forming the contract inspected, on application at the Highways Office, 155, Kirkstall Road. Sealed tenders endorsed "Tender for Private Street Works," and addressed to the Highways Committee, must be delivered at the Town Clerk's Office, Town Hall, Leeds, not later than 10 a.m. on Sept. 11.

Sept. 11. Crewe.—*Making of the back passages leading from Walthall Street to Westminster Street and behind Lewis Street*, within the borough of Crewe, in accordance with plans, sections and specifications, which may be seen and all other necessary information obtained upon application to G. Eaton-Shore, borough surveyor, Earle Street, Crewe. The contractor must provide the whole of the materials required in the making of the above passages. A deposit of £1 will be required. Sealed tenders and schedule of prices upon printed forms, to be obtained from the Borough Surveyor, must be delivered to F. Cooke, town clerk, Municipal Offices, Crewe, not later than 9 o'clock in the forenoon of Sept. 11, endorsed "Tender for Back Passage Making." No tender will be accepted unless made out on the printed form above named, with all the items in the schedule of prices fully priced.

Sept. 11. London, N.—*Supply and delivery at Lower Edmonton Station of the Great Eastern Railway of about 1,190 (or thereabouts) square yards of adamant, J. Ellis & Son's imperial Victoria indurated, or shap granite stone paving for footways*, for the U.D.C. Forms of tender and full particulars may be obtained on application to G. E. Eachus, the engineer and surveyor to the Council, Town Hall, Lower Edmonton. Sealed tenders, which must be upon the forms supplied by the Council, endorsed "Tenders for Paving Stone," must be delivered to W. F. Payne, clerk to the Council, Town Hall, Lower Edmonton, not later than 12 noon on Sept. 11. Fair wages clause.

Sept. 12. Cardiff.—*Forming, metalling, paving, kerbing, and channelling* Shirley Road, Tydfil Place, Monthermer Road, Penywain Road, Rhymney Lane, Tydfil Lane, Shirley Lane, Ninian Lane, Monthermer Lane, Orchard Place, and Daisy Street. Drawings and specifications may be seen, and forms of tender obtained at the office of Mr. W. Harpur, M.Inst.C.E., City Engineer, Cardiff. Sealed tenders endorsed "Tender for Private Street Works" are to be delivered to J. L. Wheatley, town clerk, Town Hall, Cardiff, on or before Sept. 12.

Sept. 12. Kingston-on-Thames.—*Levelling, paving, metalling, flagging, channelling, sewering, and lighting Chesham Road*, in the said Borough, in accordance with the plans and specification prepared by the Borough Surveyor, which can be seen at his office, Municipal Offices, where forms of tender can be obtained. Sealed tenders endorsed "Tenders for Chesham Road," to be sent to H. A. Winser, town clerk, Municipal Offices, Kingston-upon-Thames, not later than Sept. 12. The person whose tender is accepted will be required to enter into a contract and bond, with two sureties, for the due performance of the work.

Sept. 15. Chesham.—*Completion of certain private street works (including metalling, paving, and relaying, kerbing, and channelling) in Stanley Avenue*, situate within the U.D. of Chesham. Plans, sections, and specification may be seen upon application to P. C. Dormer, surveyor and waterworks engineer, Council Offices, Chesham. The firm whose tender is accepted will be required to enter into a contract and bond with two approved sureties for the due performance of the contract. A copy of such contract and bond may be seen during office hours at the office of J. G. How, clerk to the Council, High Street, Chesham. Tenders, sealed and endorsed "Stanley Avenue," to be delivered to P. C. Dormer on or before Sept. 15, at 10 a.m.

Sept. 24. Witham.—*Use of Steam Roller and Scarifier*, to include driver, flagman and coal, at such times and places as the surveyor, Mr. W. P. Perkins, Witham, may direct. Tenders, endorsed "Tender for Steam Roller," to be sent by Monday, Sept. 24, to Wm. Bindon Blood, clerk to the U.D.C., Witham, Essex.

SANITARY.

Sept. 8. Reigate.—*Construction of about 1,330 lineal yards in all of sewers in Station Road, Rees's road, High Street, Brighton Road footpath, and Somerset Road, Meadvale*, all within the borough of Reigate, in accordance with the plans, sections, and specifications prepared by F. T. Clayton, C.E., the borough engineer and surveyor. Bills of quantities and forms of tender can be obtained on application at the office of the said engineer and surveyor, Municipal Buildings, Reigate, where the said plans, sections, specifications, and general conditions may also be inspected. The contractor whose tender may be accepted will be required to enter into a contract in writing, the form whereof may be seen of A. Smith, town clerk, and himself and his surety or sureties will be required to enter into a bond for the due fulfilment of the contract. Sealed tenders, which must be on the forms supplied, giving the names and addresses of two sureties, are to be sent to the Town Clerk, at the Municipal Buildings aforesaid, endorsed "Tender for Sewers," not later than noon of Sept. 8.

Sept. 10. Whickham.—*Laying of about 550 lin. yards of 12-in. and 2,500 lin. yards of 9-in. gravitating socketted stoneware pipe sewers, erection of ejector stations, air compressing station, &c.*, and other works in connection therewith for the sewerage of Marley Hill and Sunniside. Plans and specification may be seen and other particulars obtained (by appointment) on application to the Council's Surveyor, J. B. Renton, Council Offices, Whickham. Tenders in sealed envelope to be delivered to T. Lambert, solicitor, clerk to the Whickham U.D.C., Town Hall, Gateshead, not later than noon on Sept. 10.

Sept. 10. Austwick.—*Providing and laying of about 3,943 lineal yards of 9, 8, and 6in. internal diameter socketed glazed stoneware and cast-iron pipe sewers, the construction of manholes, lampholes, ventilators, and flushing chambers; the laying-out of about four acres of land for filtration purposes, with screening chamber, distributing carriers, embankments, and fencing, &c*, together with other necessary works in connection with the above sewerage scheme at Austwick. Plans, specification, and conditions may be seen, and quantities and tender forms obtained by persons desirous of sending in bona fide tenders, on application to the Council's engineer and Surveyor, T. A. Foxcroft, Town Hall, Settle, and sealed tenders, marked "Austwick Sewerage," which may be for the whole of the works, or for contracts Nos. 1 or 2 separately, should be delivered to T. E. Pearson, clerk to the Council, at the Town Hall, Settle, not later than Sept, 10.

Sept. 10. Lanark.—*Providing. laying, and jointing about 5,200 lineal yards of sewers from 6ins. to 15ins. diameter, building manholes, &c.*, and carrying out other relative work, for the District Committee of the Lower Ward of the County of Lanark. Drawings may be seen at the office of Warren & Stewart, civil engineers, 94, Hope Street, Glasgow, where copies of the specification and schedule of quantities may be obtained on payment of £1 1s. Sealed offers, endorsed "Steps Drainage," to be lodged with W. H. Hill, clerk to the District Committee, 194, Ingram Street, Glasgow, not later than 12 noon on Sept. 10.

Sept. 11. Rhondda. — *Scavenging of the Rhondda district* for the U.D.C., in sections, for the term of one year. Specification and form of tender may be obtained at the Surveyor's Department, Public Offices, Fentre, Rhondda. All tenders must be delivered under seal by 10 a.m. on Sept. 11, addressed to the Chairman of the said Council, and endorsed, "Tender for Scavenging."

Sept. 11. Colchester.—*Dedham drainage*, for the Lexden & Winstree R.D.C. The contract will comprise stoneware pipe sewers 9in. and 6in. in diameter, with manholes, &c., and construction of small pumping station, concrete tanks, percolating filters, &c. Plans, conditions, and specification may be seen and copies of quantities and form of tender obtained from Sands & Walker, engineers, Milton Chambers, Nottingham, between the hours of 9 a.m. and 6 p.m., on payment of £3 3s. by cheque. Sealed and endorsed tenders to be sent to C. H. Tompson, clerk to the Council, Victoria Chambers, Colchester, on or before Sept. 11.

Sept. 12. Tullibody.—*Laying sewers and constructing sewage tank in the special drainage district of Tullibody.* Drawings can be seen in the office of Sir W. R. Copland, C.E., 146, West Regent Glasgow, and copy of specification, and duplicate copies of schedule of quantities, may be obtained from him on payment of a fee of 10s. 6d. An assistant engineer will meet intending contractors at Cambus Railway Station at 10.30 on Sept. 5 and will show them over the ground. Sealed offers, eudorsed "Tender for Sewerage Works, Tullibody," to be lodged with J. W. Moir, county clerk, Alloa, by 12 noon on Sept. 12.

Sept. 12. Rathdown.—*Fitting up water closets and urinals* at the workhouse, in accordance with the plans and specifications prepared by Mr. George T. Moore, A.M.I.C.E., which can be seen at the clerk's office, Loughlinstown, on all week days (Saturday excepted) between the hours of 11 and 3. Sealed tenders, addressed to the Chairman of the Board, and marked on the outside "Tender for W.C.'s, &c.," to be deposited not later than 12 o'clock noon on Sept. 12, with Patrick Cunniam, clerk to the Union, clerk's office, Loughlinstown.

Sept. 17. London, W.—*Re-drainage and sanitary work at the Nurses' Home, St. Marylebone Infirmary*, Rackham Street, Notting Hill, W. Persons desiring to tender may inspect the specification and drawing, and obtain bills of quantities and form of tender, between the hours of 10 a.m. and 4 p.m. (Saturday 10 a.m. to 1 p.m.), upon application to the Guardians' architect, A. Saxon Snell, F.R.I.B.A., of 22, Southampton Buildings, Chancery Lane, W.C., and depositing with him a £10 Bank of England note. Tenders to be signed, sealed, and endorsed "Tender for Re-drainage and Sanitary Work at the Nurses' Home," and addressed and delivered to H. T. Dudman, clerk to the Guardians, Guardians' Offices, Northumberland Street, Marylebone Road, W., at or before 10.30 a.m. on Sept. 17.

TOO LATE FOR CLASSIFICATION.

Sept. 7. Scarborough.—*Painting* at the cemetery. Specification may be seen at the board-room, Cemetery Lodge, between the hours of 10 a.m. and 4 p.m. (Saturday excepted). Tenders should be sent in to the superintendent, endorsed "Painting," not later than Friday, Sept. 7.

Sept. 8. Shipley.—*Alterations and additions* to the Salt Schools, Shipley. Names to be sent to Sam Bradley, architect, Yorkshire Bank Chambers, Shipley, not later than Sept. 8.

Sept. 10. Rhymney.—*Alterations and building additions* to "Tymawr," Rhymney. Plans and specification can be seen at "Tymawr," or at the office of T. Roderick, architect, Ashbrook House, Aberdare, where bills of quantities can be obtained on application. Endorsed tenders to be sent in to T. Edwards, Esq., "Tymawr," Rhymney, not later than Sept. 10.

Sept. 11. Llantrisant. — *Erection of four bungalows* at Coed-Ely, near Llantrisant, for the Welsh Navigation Steam Coal Co. Plans and specifications may be seen at the office of P. J. Jones, architect, Cilfynydd, Pontypridd, to whom tenders are to be sent on or before Sept. 11.

Sept. 13. Choppington.—*Flagging* the bottom and slopes of a setting pond at Choppington Colliery (area of concrete flagging about 1,070 sq. yds.), for the Cowpen U.D.C. Plans and specification may be seen and forms of tender obtained at the offices of Robert Grieves, surveyor to the Council, Seaforth Street, Blyth, to whom sealed tenders, endorsed "Tender for Flagging," must be delivered not later than 4 p.m. on Thursday, Sept. 13.

Sept. 13. Tylorstown.—*Erection of Pastors' villa.* Plans and specifications can be seen with Mr, J. E. Jones, Hendrefadog Shop, Tylorstown. Tenders to be sent, sealed and endorsed, to Mr. Thomas Hill, 13, Church Terrace, Tylorstown, not later than Sept. 13.

Sept. 15. Bargoed.—*Erection of a vestry* for the Welsh Baptist denomination. Tenders to be sent in to Mr. Mark Old, 20, Henry Street, Bargoed, on or before Sept. 15. Plans and specifications may be seen with the above or with P. Vivian Jones, P.A.S.I., architect and surveyor, Hengoed.

Sept. 18. Spennymoor.—*Supplying and laying new concrete flags and kerbing* for a portion of High Street, Spennymoor, for the U.D.C. Plans and specifications may be seen, and forms of tender obtained, on application to Mr. C. R. Spencer, surveyor to the Council, Silver Street. Spennymoor. Tenders, marked "High Street Footpath," to be sent to F. Badcock, clerk, Council Offices, Spennymoor, not later than Tuesday, Sept. 18.

No date. Keighley.—*Erection of a spinning mill*, shed, engine and boiler houses, chimney, &c., South Street, Keighley. Drawings may be seen and quantities obtained with J. B. Bailey & Son, architects, 3 Scott Street, Keighley, on Sept. 7.

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Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, *Great New Street, Fetter Lane, E.C.*

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Aberdeen.—Accepted for the widening of Union Bridge by the addition on each side of a steel arch rib and by extending the existing masonry abutments, and all other works in connection therewith, for the Town Council. W. Dyack, M.I.C.E., burgh surveyor:—

G. Hall, Back Hilton Road £6,518 2 11

Enfield.—For the erection of first portion of new central premises, including grocery warehouse and outbuildings in Ordnance Road, Enfield Highway, for the Enfield Highway Co-operative Society, Ltd. Mr. Frank Bethell, architect, 23, Queen Anne's Place, Bush Hill Park, Enfield. Quantities supplied by the architect:—

P. & R. Paul	£2,686 0 0
L. & W. Patman	2,684 0 0
W. Lawrence & Son	2,593 0 0
E. Newman	2,578 0 0
Lane & Harvey	2,545 0 0
Allen Fairhead & Son	2,545 0 0
Jennings & Grenfield*	2,500 0 0

*Accepted,

Faversham.—Accepted for the erection of a nurses' home adjoining the workhouse, for the Guardians:—

Whiting Brothers £1,099

Maidstone.—For the erection of new depot buildings in Mill Street. Mr. T. F. Bunting, borough surveyor:—

	Buildings.	Cottage.
E. T. Jeffrey	£5,638 16 2	£568 14 9
G. Pearce & Sons	4,900 0 0	570 0 0
W. T. Burrows	4,774 3 10	470 7 0
H. J. Smith	4,646 18 0	496 2 0
Barden & Head	4,558 0 0	540 0 0
H. Goodwin	4,574 12 3	498 0 1
Elmore & Son	£4,500 0 0	£538 0 0
Cox Bros.	4,482 0 0	416 0 0
Corben & Co.	4,375 0 0	492 0 0
Wallace & Sons	4,321 0 0	476 0 0
R. Avard*	4,211 0 0	418 0 0

* Accepted.

Newbury.—For laying about 1,500 yards of sewers within the parish of Stockcross, for the Newbury R.D.C. Mr. S. J. L. Vincent, borough engineer:—

E. A. Bance	£1,950
A. J. Chivers	1,950
G. Elmes & Son*	1,932

Engineer's estimate, £2,170. (All of Newbury.)

*Accepted.

Redbourn (Herts.).—For the erection of a seven-room cottage for Mr. G. A. Dunn Mr. E. A. Fermaud, architect, 11, Chichester Street, London. S.W. Quantities by the architect.

W. J. Negus, London	£392 0 0
Edward and Medway, London	380 0 0
Geo. Neal, Kilburn	367 0 0
William Payne, Watford	352 0 0
H. Salisbury & Son, Harpenden	340 0 0
E. Peck*, Redbourn	339 9 0

* Accepted

Redbourn (Herts.)—For the erection of three cottages for Mr. G. A. Dunn. Mr. E. A. Fermaud, architect, 11, Chichester Street, London, S.W. Quantities by the architect:—

E. Horn & Sons, Hemel Hempstead	£897 0 0
Francis Newton, Hitchen	882 0 0
Geo. Neal, Kilburn	875 0 0
H. Salisbury & Son, Harpenden	859 0 0
William Payne*, Watford	783 0 0
G. W. Souster, Northampton	738 0 0

* Accepted

Ross.—For the erection of a detached house at Bridstow, near Ross, for Mr. J. Martin Newton. Messrs. Groome & Bettington, architects and surveyors, Palace Chambers, Hereford. Quantities by architects:—

	First Contract.	Add. for Oak, &c.	Total.
W. Rowbery	£1,433 7 0	£55 18 8	£1,489 5 8
W. Jones, Gloucester	£1,400 0 0	£55 0 0	£1,455 0 0
J. T. Jones	1,370 0 0	82 1 0	1,452 1 0
J. B. Kemp & Sons, Ross	1,355 0 0	52 4 0	1,407 4 0
W. Lewis, Ross	1,320 0 0	47 16 6	1,367 16 0
W. James, Bromyard	1,339 0 0	25 0 0	1,364 0 0
W. Powell	1,260 0 0	46 10 1	1,306 10 1
W. Bolt	1,230 0 0	70 15 0	1,300 15 0
C. Cooke	1,209 0 0	54 8 4	1,263 8 4
E. W. Wilks*	1,135 0 0	42 2 0	1,177 2 0

*Accepted. [Rest of Hereford.]

Uxbridge.—Accepted for the erection of the Greenwey Church Hall:—

Fassnidge & Son, Uxbridge... ... ... £1,530

Watford.—For private street works, for the Watford U.D.C. Mr. D. Waterhouse, engineer and surveyor:—

	Mildred Avenue.	Sussex Rd.
J. Mowlem & Co.	£1,785 0 0	£712 0 0
Fry Bros.	1,736 5 8	717 1 0
G. R. Mann	1,735 0 0	688 0 0
W. Shepherd & Sons	1,715 17 6	705 16 4
Wilson, Border & Co.	1,690 0 0	680 0 0
T. Adams	1,667 11 4	683 7 6
Hardy, Bate & Co.	1,767 1 6	699 14 6
W. & C. French	1,650 0 0	675 0 0
T. Free & Sons	1,646 16 0	660 1 0
A. F. Lee	1,636 0 0	686 0 0
W. & D. Wilkins	1,625 0 0	—
H. B. Watkins	1,590 0 0	656 0 0
J. Jackson	1,572 19 2	680 14 9
W. Wilson	1,555 0 0	640 0 0
Zadig & Co.	1,549 0 0	662 0 0
Bower Bros.	1,517 0 0	619 0 0
W. H. Worthington	1,508 5 3	614 3 1
J. & J. Goss	1,508 0 0	588 0 0
W. Johnson	1,470 0 0	604 0 0
H. Brown	1,309 0 0	596 0 0
Bracey & Clark*	—	580 0 0
T. C. Starkey (incomplete)	590 0 0	244 6 0

* Accepted.

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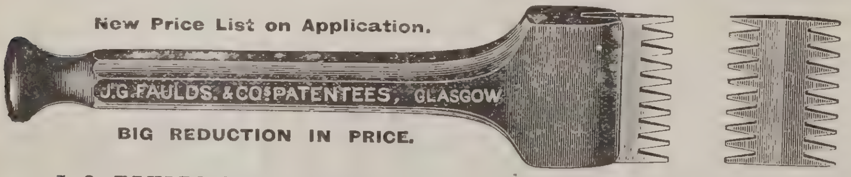

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THE BUILDERS' JOURNAL

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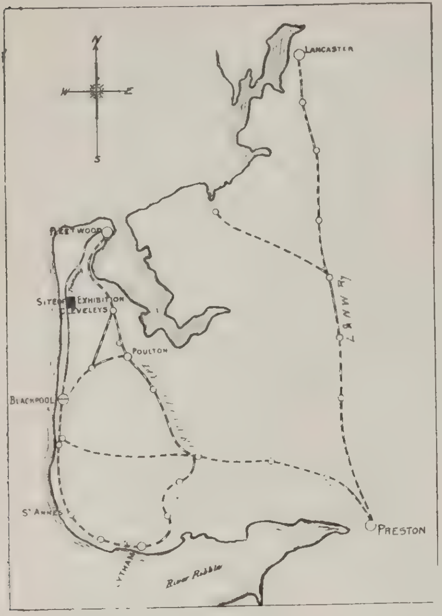
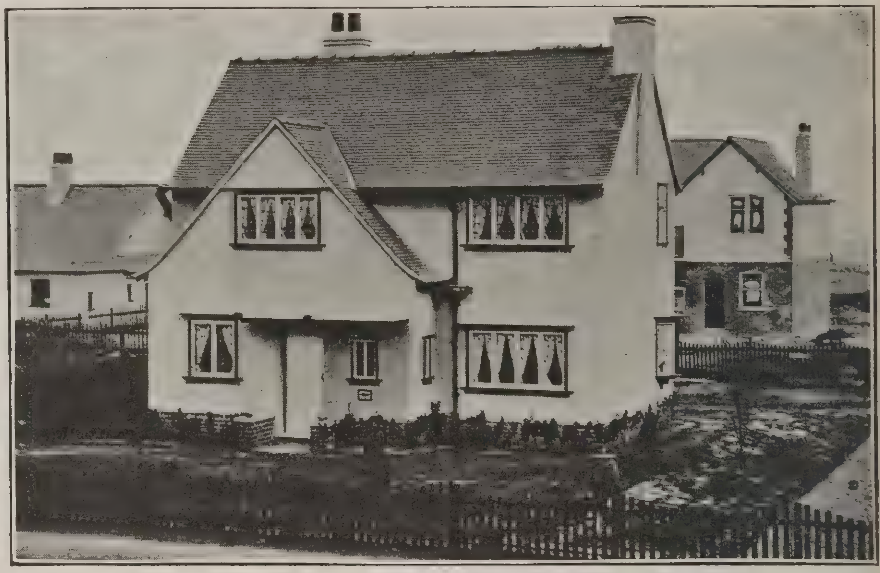
Bad Acoustics. ARCHITECTS have been constantly assailed about the bad acoustics of certain buildings, such as law courts and council chambers, and it appears that some dissatisfaction is being expressed with reference to Croydon's new county court, and also with the council chamber of the new City Hall at Belfast. The former appears to have a distressing echo, while, as regards the latter, it is not plain whether there is an echo or only reverberation. Exact knowledge of architectural acoustics is quite recent. A few years ago it would have been impossible to guarantee that a building should be satisfactory so far as its hearing capacity was concerned, unless it were copied in every dimension, detail and material from an existing hall which had been found satisfactory. The authors of existing books on the subject have been all at sea in the matter, and it was not until Professor Sabine, of America, made his researches (which we have several times referred to in our columns) that information was available which would assure success. It is not so much a question of the shape or proportions of a hall, although an echo will be much worse with some shapes than others, and, of course, a building may be too large for the voice to be heard perfectly from all parts of it. The acoustic properties depend more upon the cubical contents and the absorptive power of the materials which form the surfaces of the compartment. It is now possible to calculate the exact amount of sound which it is necessary to absorb and the amount of materials which will do this. It is a point of difficulty, however, with buildings belonging to the class above referred to that the number of persons occupying them varies so considerably. It may have been noticed that a very marked echo often can be obtained in a hall which is empty or nearly so, whereas none exists when the hall is full of persons.

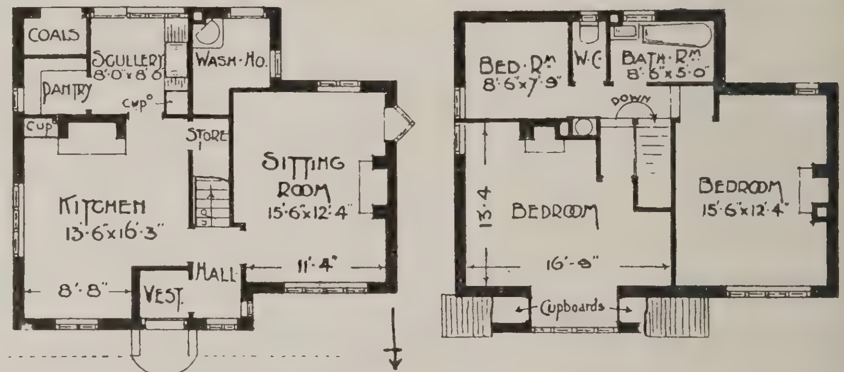
The Design of Capitals. IT is rather a peculiar fact that so little freshness should be imbued into the design of capitals. The classic examples seem to be regarded as the only possible and proper models to follow. While it is true that in Grecian work especially these are most exquisite—the Ionic being particularly refined—there is plenty of scope for architects of to-day to design capitals which would strike a new note. Efforts of the kind have of course been made, but they are not very numerous, and when made by designers who are crankish in all their works it is hardly likely that the results would be pleasing. Nevertheless, we feel there is scope for refined modern design in capitals. Architects might very well devote more attention to the matter. Nash had a fancy for it, and the capitals he produced were most interesting.

A Circulating Technical Library. IN the *Electrical Review* we notice a suggestion which, though put forward in the specific interests of the electrical industry, is equally applicable to architecture and the building trades. The suggestion is that there should be a circulating library of technical books. A "Resident Engineer" urges that such a library would be a great boon to students—more especially students in the provinces—who would thus be enabled to obtain many new and important works otherwise beyond their reach. The ideal arrangement would seem to be a sort of miniature Mudie. "I feel sure," says the correspondent, "that many of the supply companies and corporations as well as the larger firms of manufacturers and contractors, would act as local agents. They would receive boxes of books, say, once a month, and those of their employees who wished to avail themselves of the volumes would pay a share of the annual subscription." Commenting on the suggestion, our contemporary says that a similar idea was put forward about a year ago in Manchester, and some attempt was made to carry it into practice, but the fact that nothing has been heard of the project of late suggests that it was found to be impracticable, or that adequate support was not forthcoming. The suggestion is nevertheless an interesting one. It would be quite outside the scope of any disinterested individual to attempt to establish such a library, say, for the architectural profession and the building world, but it might perhaps be done by a society. At present, of course, publishers send copies of new works to the societies, or at least the societies get them as free gifts from members. While in London, however, the societies' libraries may be up-to-date, we do not suppose that this is the case throughout the country. But there is one point in connection with architectural works which should be pointed out, namely, the size of some of the books. These are often very large and unwieldly, and it would be awkward to send them about the country continually: but a great many new books not now easily accessible to students and others could very well be forwarded from place to place, and it is in respect of these especially that some sort of circulating library would be a service. While referring to this matter it is opportune to note that Sir William H. Bailey in his inaugural address to the Library Association at Bradford last week spoke of the Forney libraries of industrial art which are established in the working-class districts of Paris. They are under municipal control, and when all are erected there will be one in each of the 100 wards of the city. The special object is to provide books of interest to the particular trade of every district. Sir William Bailey instanced a library of cabinet-making which he visited. "I there saw," he says, "models and drawings of thousands of articles of utility and beauty made of wood, and the librarian assured me that anything that could be found in the pages of books on woodwork might be found on the shelves." Plasterers, house decorators, designers of iron and bronze gates, builders and other workers in the constructive and decorative arts are similarly catered for.





CLASS I. FIRST PRIZE: ALBERT E. DONE, ARCHITECT. (Cost £290.)



CLEVELEYS COTTAGE EXHIBITION.

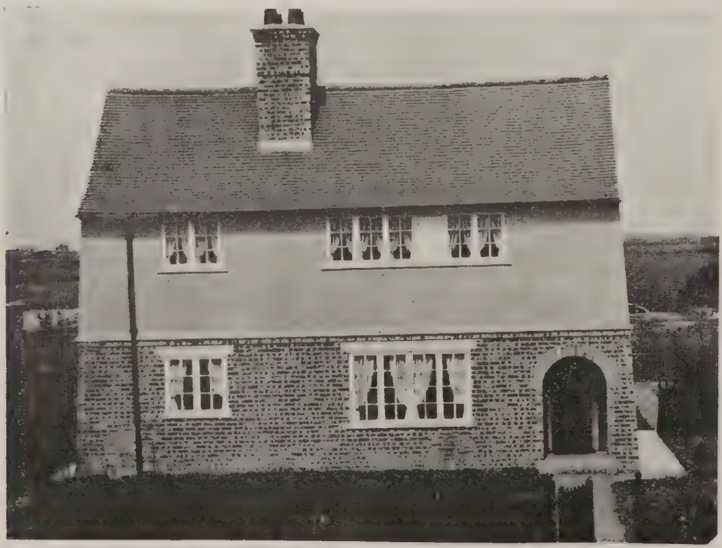
In our issue for last week we were able to publish the judges' report and awards in the Cottage Competitions held in connection with the exhibition of small houses at Cleveleys. We are now able to give some illustrations of the prize cottages, together with some particulars of the exhibition.

Cleveleys, it may first be stated, is situated on the Lancashire coast, four miles from Blackpool; its position is clearly shown by the small map above. It is easily accessible by tramway both from Blackpool and Fleetwood. The soil is a light marl, well drained; a good water-supply has been laid on, an efficient drainage scheme completed (sewers being connected to all houses), while, for lighting, there will shortly be gas—and probably electric light—available.

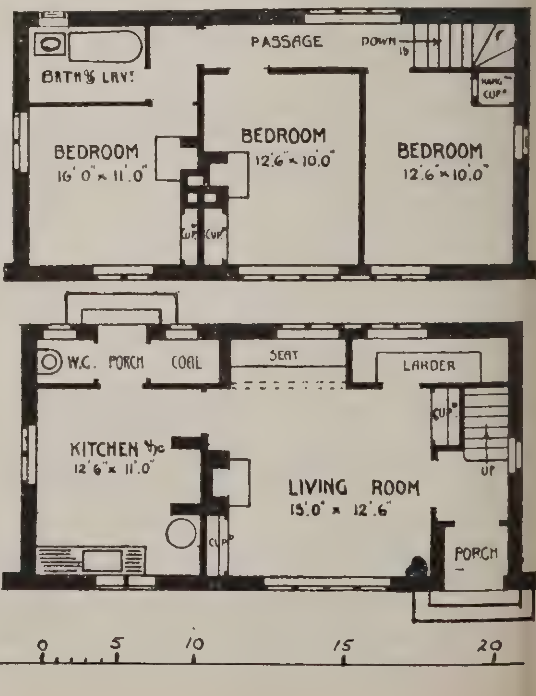
The exhibition was opened towards the end of July and closes on September 29th. It has been directed by the Fleetwood Estate, Ltd., the owners of the site, and may be considered as complementary and supplemental to the exhibition at Letchworth (Garden City); for, at Cleveleys, the main object has been to show how cheaply, yet substantially, a good cottage or small house may be erected under existing by-laws of average severity (those of the Thornton Urban District Council), no precise cost being stipulated, but the prizes awarded for "the best value for money"; whereas, at Letchworth, the £150 cottage dominated the scheme, and the exhibition was specially intended to show what might be built if only the vexatious rural by-laws were relaxed.

The cottage exhibits at Cleveleys are of four classes, and the awards have been made on the basis of external appearance, economy of planning, convenience, cost per ft. cube, and least expenditure for maintenance and repairs; exhibitors being required, prior to the opening of the exhibition, to declare the price (including builder's profit) at which, under similar conditions, they would be prepared to duplicate their exhibits.

The judges, as stated in our issue for last week, were Mr. John H. Woodhouse, F.R.I.B.A., president of the Manchester Society of Architects; Mr. Charles H. Barnsley, Birmingham, past-president of the Institute of Builders; and Mr. Henry R. Aldridge, secretary of the National Housing Reform Council; these three having been appointed respectively by the Royal Institute of British Architects, the Institute of Builders, and the National Housing Reform Council.



CLASS I. SECOND PRIZE: BERTRAM DRUMMOND, A.R.I.B.A., ARCHITECT. (Cost £275.)



The four classes of cottage exhibits were:—

Class I. Detached Cottage, with not fewer than three bedrooms.

Class II. Pair of cottages, with not fewer than three bedrooms in each.

Class III. Design and specification for detached cottage to cost not more than £180.

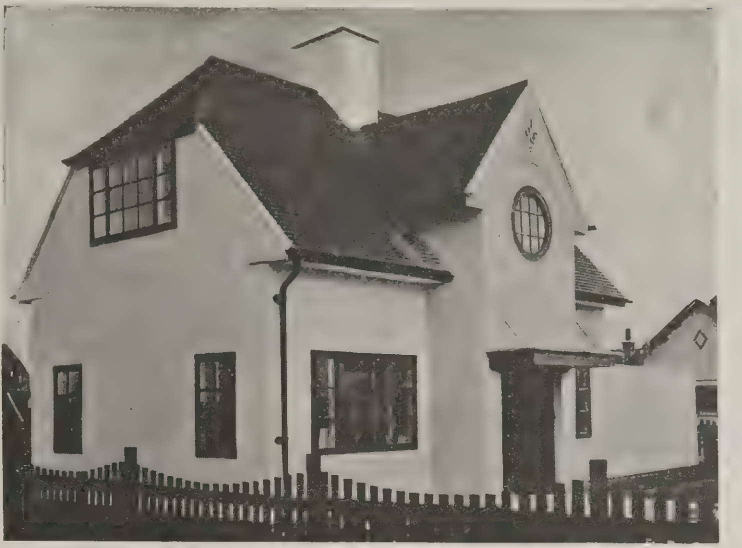
Class IV. Design and specification for pair of cottages to cost not more than £350.

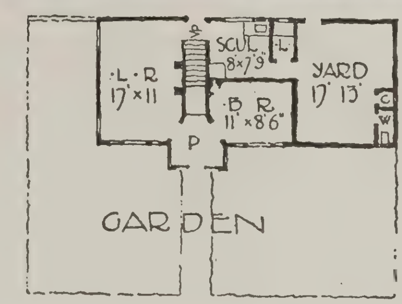
In addition, there was Class V. for the best laid-out garden, those competitors in Classes I. and II. who did not wish to compete in this class being required to allow their plots to be laid out as gardens.

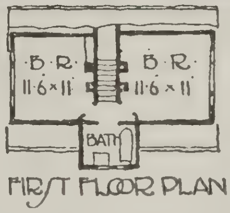
Diplomas were also awarded for the best exhibits in connection with the building and furnishing of cottages in Classes I. and II.

Two large pavilions have been erected on the estate in which the designs for cottages, and the trade exhibits of materials, furniture, &c. are shown.

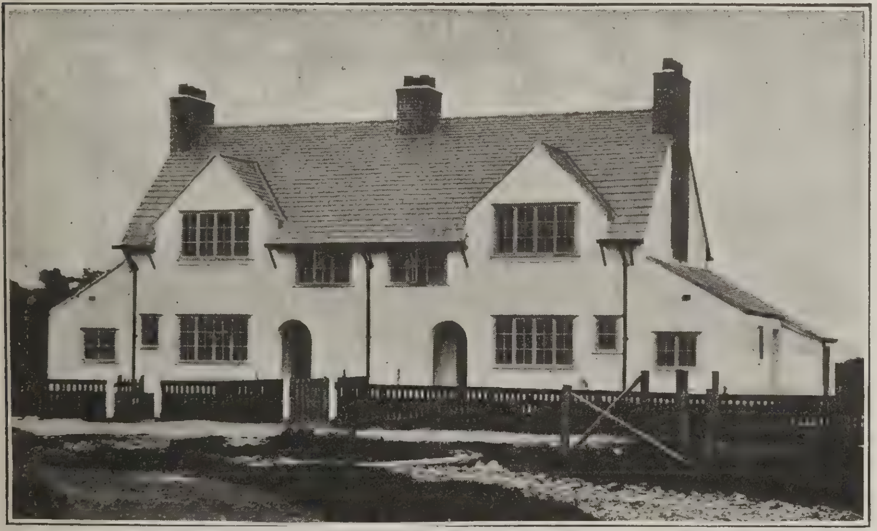
In Class I. the first prize (£100) has been awarded to cottage No. 27. The successful architect is Mr. Albert E. Done, of 2, Oxford Road, Blackpool. There is no need to describe the accommodation, as this is shown by the plans here reproduced. The house cubes 16,725ft. which at 4½d. gives a total cost of £290 (this including the cost of the house as built, with sewers, fencing, copper back boiler and cylinder, and £10 for grates, but not for forming garden and paths, nor wall decorations). The cost of the house if duplicated is put at £285 (including builder's profit and architect's fees, but exclusive of site, fencing, sewers, paths, and ornamental rainwater head). There is concrete under all walls and over the site. Walls are of brick 11ins. thick, with a cavity, and rough cast on the exterior with Portland cement, dashed with amber spar—not to be colour washed; roofs are of hand-made red tiles (supplied by the Silverdale Tiles Co., Staffs.).

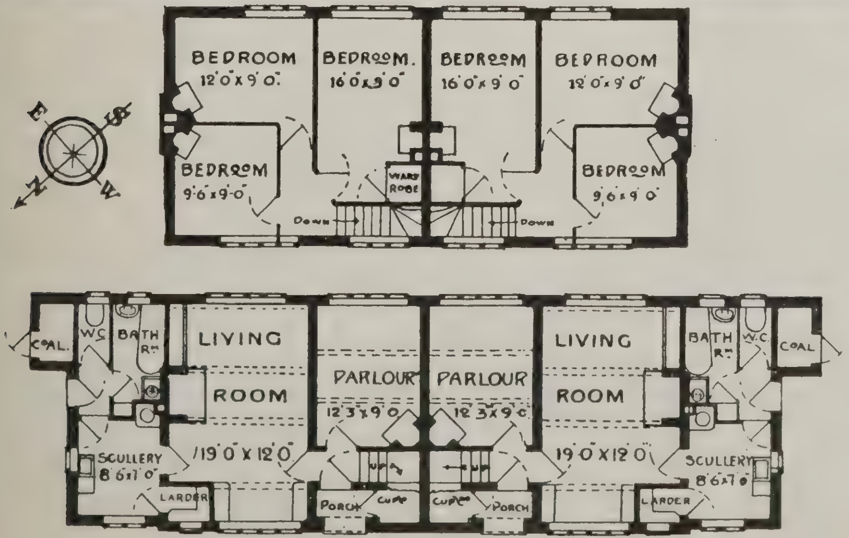






CLASS I. THIRD PRIZE: PATRICK ABERCROMBIE, ARCHITECT. (Cost £228.)

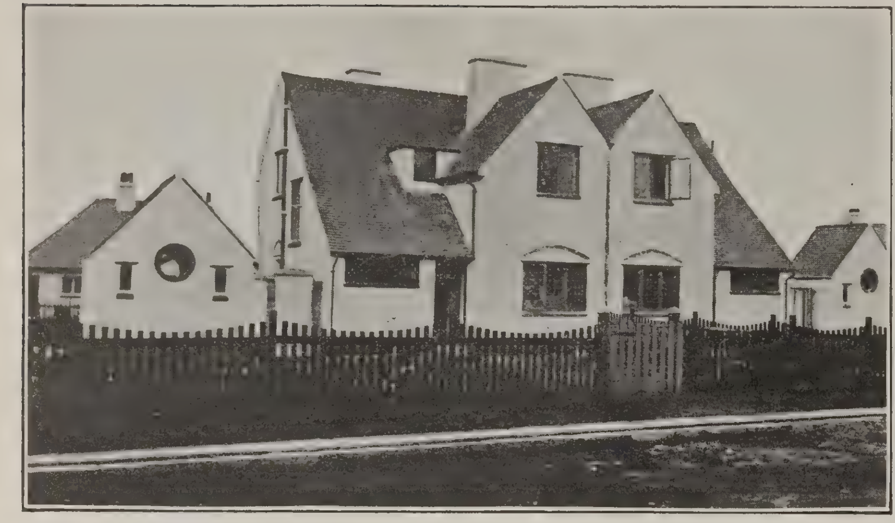


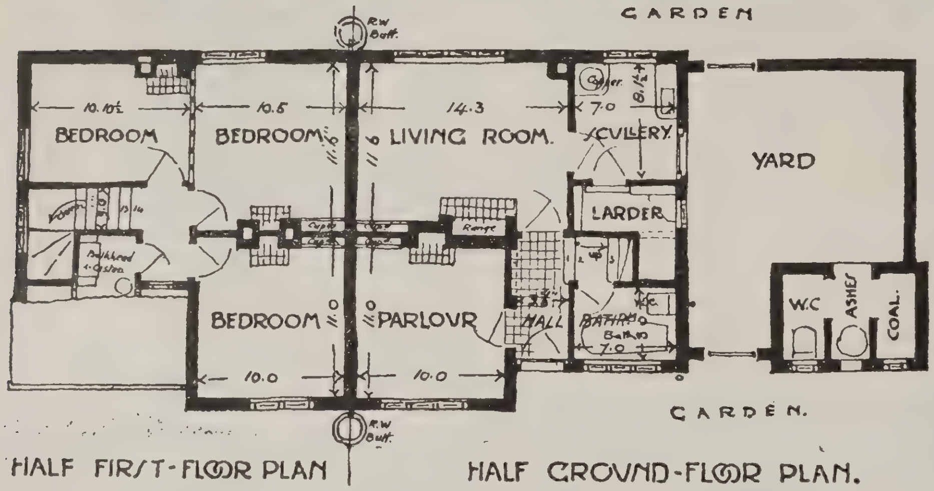


CLASS II. FIRST PRIZE: Q. MANGNALL BLUHM, ARCHITECT. (Cost £430 the pair.)

The second prize (£50) in Class I. is awarded to cottage No. 14, the architect of which is Mr. Bertram Drummond, A.R.I.B.A., of 6, Birley Street, Blackpool, and 16, Clifford's Inn, London, E.C. The builders were Messrs. J. Preston & Sons, of Adelaide Street, Fleetwood. The cost of this cottage is given as £275 (cubing 13,904ft. at 4¾d). If duplicated, the cost is put at £325 (including builder's profit and architect's fees, but exclusive of site, fencing, sewers and street making); it is stated that "this price could be considerably reduced on a modified specification." In the kitchen scullery there is a fireclay enamelled sink with a wooden drainer, and a cupboard under; also a portable copper. The cottage has a concrete foundation, with a layer of asphalt under all walls, these latter (external) being 11ins. thick, with a cavity, built of good common bricks, and the upper part rough-cast; roofs tiled. Special care has been taken with the construction, all external wood lintels being covered with sheet lead, and the chimney surrounded with 9-in. brickwork. There are no outbuildings, everything being under one roof.

The third prize (£25) in Class I. has been awarded to cottage No. 22. The architect is Mr. Patrick Abercrombie, of Chester, and the builder Mr. Edward Saville, of South Shore, Blackpool. The cost of the cottage as built is given as





CLASS II. SECOND PRIZE: T. FAULKNER SHEPHEARD, ARCHITECT. (Cost £222 each Cottage).

£228 (11,547 cub. ft. at 4¾d. per cub. ft.), and the cost, if duplicated, £229 (exclusive of fencing, drainage and garden). Coals and W.C. are provided in a corner of the yard. Walls are of brick, 11ins. thick, with cavity, and rough-cast: roofs of hand-made Staffordshire tiles. The architect states: "A special feature of the plan is the placing of one bedroom downstairs, so that when only two or three people are staying in the house it may be used as a small parlour. The yard has been placed at the side, and entirely walled off, so that there is no 'back' to the house."

Of cottages honourably mentioned in Class I. there are three:—No. 32, by Messrs. Lancaster & Atkinson, builders, of Fleetwood (cost £314, at 4⅛ per cub. ft.); No. 24 (cost £320, at 4·68d. per cub. ft., exclusive of site), for which Mr. Gilbert Fraser, A.R.I.B.A,, of Liverpool, was the architect—a cottage built with concrete blocks, identical with the one erected from Mr. Fraser's designs at Letchworth; and No. 8, a brick-built bungalow, by Messrs. Dickinson & Kirkham, of Mawdsley Chambers, Bolton, costing £251, at 3½d. per cub. ft.

Pairs of Cottages.

In Class II., for pairs of cottages, the first prize (£100) is awarded to Nos. 42 and 43, the architect for which was Mr. Q. Mangnall Bluhm, of Wood Street Chambers, St. Anne's-on-the-Sea, and 408, Temple Chambers, Brazennose Street, Manchester; the builders being Messrs. Lancaster & Atkinson, of Fleetwood. The cost of this pair of cottages is given as £430 (4$\frac{4}{10}$d. per cub. ft.). If duplicated, £500 (including builder's profit and architect's fees, but exclusive of site, fencing and sewers). There is a cupboard for cloaks, &c., in the porch; the coal-house is covered over; a wardrobe is provided in the first bedroom, and a cupboard in the living-room: hot and cold water are laid on to bath, lavatory and sink. The foundation is of cement concrete, 8ins. thick under main walls and 4ins. thick over whole site. External walls are of brick 11ins. thick, with a 2in. cavity, rough-cast and limewashed; roofs of Borrowdale thick green slates, from the Buttermere Green Slate Co., of Keswick: slab partitions by Fireproof Plate Wall Co., of Manchester; hearths, &c., formed with Van Straaten's hand-made Dutch tiles.

The second prize (£50) in Class II. is for the pair of cottages, Nos. 25 and 26. The architect of these is Mr. T. Faulkner Shepheard, of 13, South Bank, Birkenhead, and the builders Messrs. Leach & Sons, of Cleveleys. At 4¾d. per cub. ft., the cost is given as £222 for each cottage; if duplicated, £270 (including builder's profit and architect's fees, but exclusive of site, fencing, and sewers). On the upper floor a small cistern-room is provided, containing cistern, hot-water cylinder, and shelves for linen. The w.c., ashpit, and coalplace are in the yard. Foundations are of concrete, walls of brick 11ins. thick, built with a cavity, and rough-cast on face; roofs of hand-made Silverdale tiles. The architect's note on the cottages is as follows: "The houses have been placed on the site with the yard at the side, so as to leave the garden as uninterrupted as possible, with the windows of both rooms looking on to it. The bath-room, while conveniently reached from bedrooms, and well screened from the hall, can, at the same time, be used as a downstairs lavatory. The sinking of the larder will tend to make it cooler and better for storage of food, at the same time giving greater shelving space. By placing the cylinder next the cistern, the plumber's work is kept compactly together, whilst the cold water will be guarded against frost in the winter. Shelves are also provided round the cylinder for the storage of linen."

The cottages awarded the third prize (£25) in Class II. are Nos. 11 and 12. Mr. Alfred T. Martindale, of 66, Wellington Road, Bridlington, is the architect, and Mr. T. V. Martindale, also of Bridlington, the builder. £195 each cottage is the cost given, at 4½d. per cub. ft., and the same price if duplicated, plus 5% for removal of plant (including builder's profit and architect's fee, but exclusive of site, fencing and sewers). Foundations are of concrete

SMALL HOUSES AT ROSSALL BEACH, NEAR CLEVELEYS.

6ins. thick, with brick footings; external walls of brick 11ins. thick, hollow; roofs tiled; and stonework, Martindale's artificial stone.

Honourable mention in Class II. was given to the pair of cottages Nos. 28 and 29, of which Mr. John H. Mawson is the architect, and Mr. T. Riley the builder; cost £502 the pair, at 4½d. per cub. ft.

Prize Designs.

In the Classes III. and IV., for designs and specifications of cottages, the judges have made the following awards:—

Class III. (detached cottages).—First prize (£10), Messrs. J. Allen Spier & Thomas A. Beavan, Cardiff. Second prize (£5), Mr. E. A. Ould, F.R.I.B.A., Liverpool. Highly commended, Mr. W. G. Lewton, Reading; Messrs. Spier & Beavan, Cardiff; and Mr. W. R. Mosley, Slough.

Class IV. (pairs of cottages).—First prize (£10), Mr. David Peacock, Marple. Second prize (£5), Mr. E. A. Ould, F.R.I.B.A., Liverpool. Highly commended, Mr. W. G. Lewton, Reading; Mr. Harold Slater, Preston; and Mr. A. Brocklehurst, Manchester.

Our Plates

Cottage Flats and Laundry at Putney.

These cottage flats, which are in course of erection at Putney, have been designed with the intention of providing comfortable little homes for a superior class of people with refined tastes but small incomes. The work is designed as simply as possible without any pretention of architectural ornament, but depending upon the quiet beauty obtained by the craftsmanlike treatment of its honest material for effect, not only for the sake of inexpensiveness of production, but with the hope in view of in some way fostering the traditions displayed in the earlier homesteads of our countryside. The building has been treated as an architectural whole and contains four cottages of two flats, thus making eight complete homes, the accommodation to each comprising a parlour, three bedrooms, kitchen, scullery, bath, larder, w.c. and coal store, together with a small garden, access to which from the upper flats is obtained by a small internal staircase. The frontage to the road is being faced with thin Dutch bricks, five courses to the foot, while the back portions are to be built with cheaper bricks to match in tone. The roof is to be covered with hand-made thick red and brown tiles, laid in the old methods by Mr. R. Y. Ames, of Martin's Lane, Cannon Street. E.C.; the window frames and wood casements to be of deal, painted white; doors to have diamond lead glazing and to be painted green: and gutters and pipes to be of cast-iron with rain-water heads, and to be supported on wrought-iron brackets. A small laundry is to be built at the rear with ample drying ground, and a little pergola of oak, to be covered with creepers, is to be made to connect the offices to the laundry. Being placed opposite the cartway through the cottages it will afford a most pleasing view from the road. The builder is Mr. S. J. Bardall, of Balham and Hackney, and the architects Mr. William Hunt and Mr. Edmund Hunt, of Donnington House, Norfolk Street, Strand, W.C.

Notes and News

Fall of a Church Tower.—At Burlingham St. Peter, Norfolk, last Wednesday, the tower of the parish church collapsed. It was about 500 years old. The church was restored thirty years ago.

The City Bridges.—The accounts just published state that the cost of lighting, cleansing and repairing the City bridges during the past year was as follows:—London Bridge, £1,325; Southwark Bridge, £2,035; Blackfriars Bridge, £2,328.

The Columbian Fireproofing Co., Ltd., of 37, King William Street, London, E.C., have been successful in securing the contracts for the "Morning Post" building in the Strand, London; the new building adjoining the Bond Street Tube Station, London; and Washington Street Bonded Warehouse, Glasgow.

The Nantymoel Workmen's Hall, at Princetown, Glamorgan, has been enlarged at a cost of £2,500. A new stage has been provided, together with a billiard-room, committee and lecture rooms, and a lesser hall. Mr. J. Morris Williams, of Blackmill, was the architect for the work, and Mr. D. W. Davies the contractor.

Mr. Thomas Hardy, the novelist, who began life as an architect, has started a scheme for adding a tower to Holy Trinity Church, Dorchester, and has sent to the rector a sketch of his proposal "made in an idle moment." He hopes it may stimulate some wealthy lover of architecture to carry out the idea.

The New Stock Exchange at Manchester, fronting Norfolk Street and Pall Mall, is now approaching completion. The lower part of the building is treated with rock-faced light grey granite, whilst the upper storeys are faced with Portland stone. The architects of the building are Messrs. Bradshaw and Gass, of Bolton and London.

Large new Malting Premises are being erected at Sleaford for Messrs. Bass & Co. The work was commenced in 1901, and is estimated to cost half a million sterling. The buildings are not yet entirely completed. They comprise eight immense malthouses, central barley-drying kiln, engine and boiler houses, water tower, cottages for the leading hands, stables and waggon sheds.

Edict as to Wood-Block and other Floors.—The Concreters' and Ashphalters' Association at Manchester has altered its rules so as to include as members workmen who lay wood-block floors; such workmen, as a class, have been outside the pale of any organisation for years. It was also decided to make a section for concrete and asphalt labourers (who in the Manchester district number about 500), and another section for bricklayers' labourers. One month's notice is to be given to architects, surveyors, builders and others concerned, that in future members of the Concretors' and Asphalters' Association will refuse to prepare any ground for patent flooring, terrazzo, &c., for which cheap foreign imported labour is employed, displacing local British labour; and that all such work in future shall be done by members only of the Association and under proper conditions. It is alleged that at present a low rate of wages is paid to Italians and Germans who are brought into this country to do such work.

The New Transporter Bridge at Newport, Mon., is to be formally opened on September 12th.

New Council Offices at Swadlincote are being erected at a cost of £1,771 from designs by Mr. C. F. Underhill, of Swadlincote, the contractor being Mr. R. Kershaw, of Burton-on-Trent.

Messrs. Mellowes & Co., Ltd., of Corporation Street, Sheffield, have recently secured orders for glazing on their "Eclipse" patent imperishable system the roofs of works extensions for Messrs. Cammell, Laird & Co., at Sheffield; Messrs. Markham & Co., at Chesterfield; and Messrs. Ruston, Proctor & Co., at Lincoln. Also electric car sheds at Sheffield, weaving shed for Messrs. Lupton & Sons, Leeds, and the Gibson Street swimming baths, Newcastle-on-Tyne.

The South Kensington Museum Extensions, which will cost more than £1,000,000, are making good progress. For more than three and a half years an army of workmen has been engaged on the building, and the shell is now practically complete, with the exception of the tower, which is to be 220ft. high. Messrs. Holliday and Greenwood are the contractors and Sir Aston Webb and Mr. E. Ingress Bell are the architects. The floor space of the new museum will be about 13 acres, the frontages to Cromwell Road and Exhibition Road being more than a quarter of a mile, taken together. The work will not be completed for another two years.

The Victoria Baths, Manchester, were opened by the Lord Mayor on Friday last. They occupy the site of the old Victoria Park Lawn Tennis Club in High Street, and comprise three swimming baths, Turkish baths and Russian baths. The work has been carried out by Messrs. C. H. Normanton & Sons, to the designs of the City Architect, Mr. Henry Price. The engineering work has been designed and carried out under the direction of Mr. L. H. Lewis, hydraulics engineer to the Waterworks Committee, while the machinery and equipment of the laundry has been the special care of Mr. J. Derbyshire, the manager of the Manchester Corporation Baths.

Collapse of a Framework Tower.—On Tuesday last week a man named Sharpe was killed through the collapse of a large iron tower at the service reservoir which is being constructed for the Metropolitan Water Board at Marmora Road, Honor Oak. To facilitate the transference of material, two iron framework towers, 65ft. high and 700ft. apart, with a wire cable slung between, had been erected for the contractors by Messrs. Henderson & Co., of Aberdeen. The towers were finished on the Tuesday, and Sharpe mounted one of them to watch the first load of 1½tons of concrete carried across. It had only travelled a short way when the foundations of the tower gave way and the erection fell. Sharpe made a jump for a large iron pipe below, but missed it, and struck the ground, being instantly killed.

Obituary.

Mr. F. W. Ledger, A.R.I.B.A., of Epsom, died on September 2nd, aged 50.

The late Mr. William Blyth, brick and tile manufacturer, of Barton-upon-Humber, who died on June 30th last, aged 79 years, left estate which has been proved at £14,306 gross.

Notes on Competitions

Cottage Models and Designs.

Mr. C. E. Bateman, of Birmingham, the assessor appointed in the competition for models and designs of cottages exhibited at the agricultural show at Bredon's Norton recently, has made the following awards:—*Models:* first prize (£15), Mr. Henry T. Weaver, of Gloucester; second prize (£10), Messrs. Hugo Bird and Robert Browne, of Brentwood. *Designs:* first prize (£10), Mr. A. Dennis Thacker, of Birmingham; second prize (£7), Messrs. S. Cooke and Norman Twist, of Birmingham. The designs by "Red Lion" and by Messrs. Crouch, Butler and Savage were referred to in commendatory terms.

Carnegie Library, Plymouth.

At the last meeting of the Plymouth Free Library Committee it was decided that the competition for a new Carnegie Library to be erected in the borough should be restricted to local architects, not open. The president of the R.I.B.A. is to be asked to nominate an assessor, but nothing has yet been settled about premiums.

Transvaal University College.

In the recent competition among South African architects for new buildings of the Transvaal University College to be erected at Johannesburg, Mr. T. E. Collcutt, F.R.I.B.A., the assessor, has awarded the first premium to the design of Mr. R. Howden, the second to that of Messrs. Dickson & McCowat, the third to that of Messrs. Stucke & Bannister, the fourth to that of Messrs. Till & Till, the fifth to that of Messrs. McIntosh & Moffat, and the sixth to that of Messrs. Leck & Emley—all of Johannesburg. Twenty-eight architects competed. For the present the eastern wing of the new college is only to be proceeded with, the estimated cost of this work being £80,000.

Dartmouth Town Hall and Market.

At last week's meeting of the Dartmouth Town Council the Special Committee reported that, acting upon the request of his solicitors, Mr. Montague Luke, architect, of Plymouth, whose designs for the new town hall and market received the first premium in the recent competition, had sent the plans and specifications in order to obtain tenders. Mr. Roberts said he should strongly object to the plans being accepted for the purpose mentioned unless they were in accordance with the original design as sent in for competition. He understood that the plans had been cut down, altered, and amended. Alderman Ellis thought this was a matter for the Council to decide when they had the plans before them. Until they had seen them they could not arrive at any conclusion. Mr. Row proposed that the matter be referred to the Special Committee, and if they approved of the plans, to report to the General Purposes Committee accordingly. Mr. Grant seconded, and the proposition was carried.

Carnegie Libraries, Dundee.

The memorial addressed by architects in Dundee to the Town Council urging that the design of the Carnegie branch libraries should be made subject to open competition, and not placed in the hands of the City Architect (see p. 113 of our issue for last week) has not been successful, as the latter course has been adhered to, it being estimated that a saving of £1,000 will thus be effected.

List of Competitions Open.

DATE OF DELIVERY	COMPETITION.
Sept. 20	SCHOOL AT SUNDERLAND. Limited to local architects. Premiums of £5o, £20 and £10. Particulars from John W. Moncur, Borough Engineer, Town Hall, Sunderland.
Sept. 21	CONVALESCENT & NURSES' HOME AT GLOSSOP. Premiums of £20 & £10. Particulars from Mr. T. W. Ellison, Town Clerk, Norfolk Chambers, Glossop.
Sept. 22	SEWERAGE SCHEME FOR NEWCASTLE, Co. DOWN. Terms, references, experience, by this date, to Daniel Curran, Town Clerk.
Sept. 28	COTTAGE HOMES AT CLEADON and receiving house at workhouse, for Guardians of South Shields Union. Particulars from J. W. Coulson, Union Offices, South Shields.
Sept. 28	SEWAGE DISPOSAL SCHEME FOR ELLESMERE. Premium of £20. Particulars from R. E. Lloyd, clerk to Urban District Council, Ellesmere.
Sept. 29	REBUILDING OF HENSHAW'S BLIND ASYLUM AT MANCHESTER. Limited to Manchester architects. Premiums £100, £50 and £25. Assessor, Mr. John Holden, F.R.I.B.A.
Sept. (last week	PREMISES AT LEVEN, for Reform Co-operative Society, Ltd. Particulars from D. C. Wilson, secretary.
Oct. 1	ALPHABET COMPETITION. Prizes of £20, £10 and £5. For particulars see "Architectural Review."
Oct. 20	SEWERAGE SCHEME FOR HIGHBRIDGE, Somerset. Premium £20. Particulars from W. C. Shier, Surveyor to the U.D.C., Highbridge.
Oct. 22	SCHOOL AT GAYWOOD, King's Lynn. Particulars from Secretary, County Education Office, 57, London Street, Norwich.
Oct. 31	BOURSE AT CAIRO.—Premiums of £E250 and £E100. International competition. Designs to be submitted to the "Corporation des Agents de Change," Cairo, Egypt.
Dec. 14	FOUNDLING HOSPITAL, MONTEVIDEO.—Four selected designs in preliminary competition to be awarded £212 each; first premium of £742 in final competition. Particulars from Consulate-General for Uruguay, 5 & 6, Clement's Inn, London, W.C.
No date	LIBRARY AT FRIBOURG, Switzerland. (International competition.) Particulars from "La Direction des Travaux Publics," Fribourg.

LANGHO COLONY FOR EPILEPTICS.

The colony for sane pauper epileptics just completed at Langho, near Blackburn, by the Joint Committee of the Manchester and Chorlton Boards of Guardians, is noteworthy as the first State institution of its kind in this country. There are in England at present at least 60,000 victims of epilepsy. Every year about 3,000 people die from the disease, the great bulk being of the poorer class.

At Langho, Manchester has founded a system which it is fully anticipated will be followed by Poor-law authorities of other great centres. The estate which has been acquired comprises 166 acres, and the buildings at present erected number 16, giving accommodation for 272 patients and the staffs. Six homes have been provided, 3 for men and 3 for women, and they will accommodate 40 inmates each. These buildings are alike in plan, but a certain amount of variety has been introduced on the exterior. On the ground floor is a central hall, approached through a vestibule from an entrance verandah. This central hall gives access to the principal rooms on the floor, comprising a well-lighted dayroom, 34ft. by 20ft., a small room for patients seized with a fit or requiring temporary seclusion, a boot and cloak room, a dining-room 25ft. by 20ft., crockery store, larder and other conveniences. From the central hall a staircase leads to the first floor, on which are provided two dormitories, each 49ft. by 20ft. and containing eighteen beds, three single bedrooms, a lavatory and bath-room, and sanitary accommodation in a separated annexe.

The "homes" have, as far as possible, a cheerful, domestic and homelike character. There are workshops for brushmakers, upholsterers, carpenters, tailors, shoemakers, and plumbers.

Water supply is taken from the Blackburn mains, drainage and sewage purification on the septic tank system have received most careful attention, and electricity generated on the premises is the light for the whole of the buildings.

Apart from the cost of the land, which amounted to £13,267, an expenditure of £75,500 has been authorised on the buildings, but the administrative block has been erected on a scale sufficient for the needs of a much larger colony than that at present existing.

The architects for the colony are Messrs. Giles, Gough and Trollope, of London, and the contractors Messrs. Robert Neill and Sons, of Manchester.

SALARIES OF OFFICIAL ARCHITECTS.

Although the aggregate of salaries paid by the United States Government is enormous, it is a fact that the individual responsible official is notoriously underpaid, and of the underpaid officials probably the "best bargain" for the Government is the present supervising architect, who must smile rather grimly when he compares his $4,500 salary (£900) with the real worth of his service, as measured by the standard of private practice. "But," says the "American Architect," "if a salary commensurate with his work and responsibility were assigned to him, his office would at once become one of the largest political 'plums' which the Administration has to give away, and, consequently, the objective of political adventurers of the most undesirable type. The office under the present scale of compensation has attractions, first, for the 'cheap' and incapable man, to whom the salary seems even large, the very man who should not have it, that is; second, for the young and untried man, who may at bottom be qualified to do good work eventually, but who should not, simply because he is young and untried, have this important trust; third, for the tried and capable man who can, with difficulty, be persuaded to sacrifice a good deal for the sake of name and fame; and, lastly, for the architect of independent means, good artist or poor one, who is willing to do the work because of his love of art or pride of country. The salary could with propriety be trebled: in common justice and decency it should at least be doubled. The present situation is particularly unfair because, while a large part of the clerical and draughting force in the office has been brought under the Civil Service rules, the Supervising Architect himself has not this protection."

In comparison with the foregoing it is interesting to note that the salary of Mr. W. E. Riley, Superintending Architect to the London County Council, is £2,000 a year; Mr. T. J. Bailey, London County Council (Education) Architect, £1,200; Sir Henry Tanner, Principal Architect to H.M. Office of Works, £1,200; and Mr. W. T. Oldrieve, H.M. Office of Works (Edinburgh), £1,000.

We are so accustomed to hear of the great salaries which are paid to high officials in the United States that these figures are particularly suggestive.

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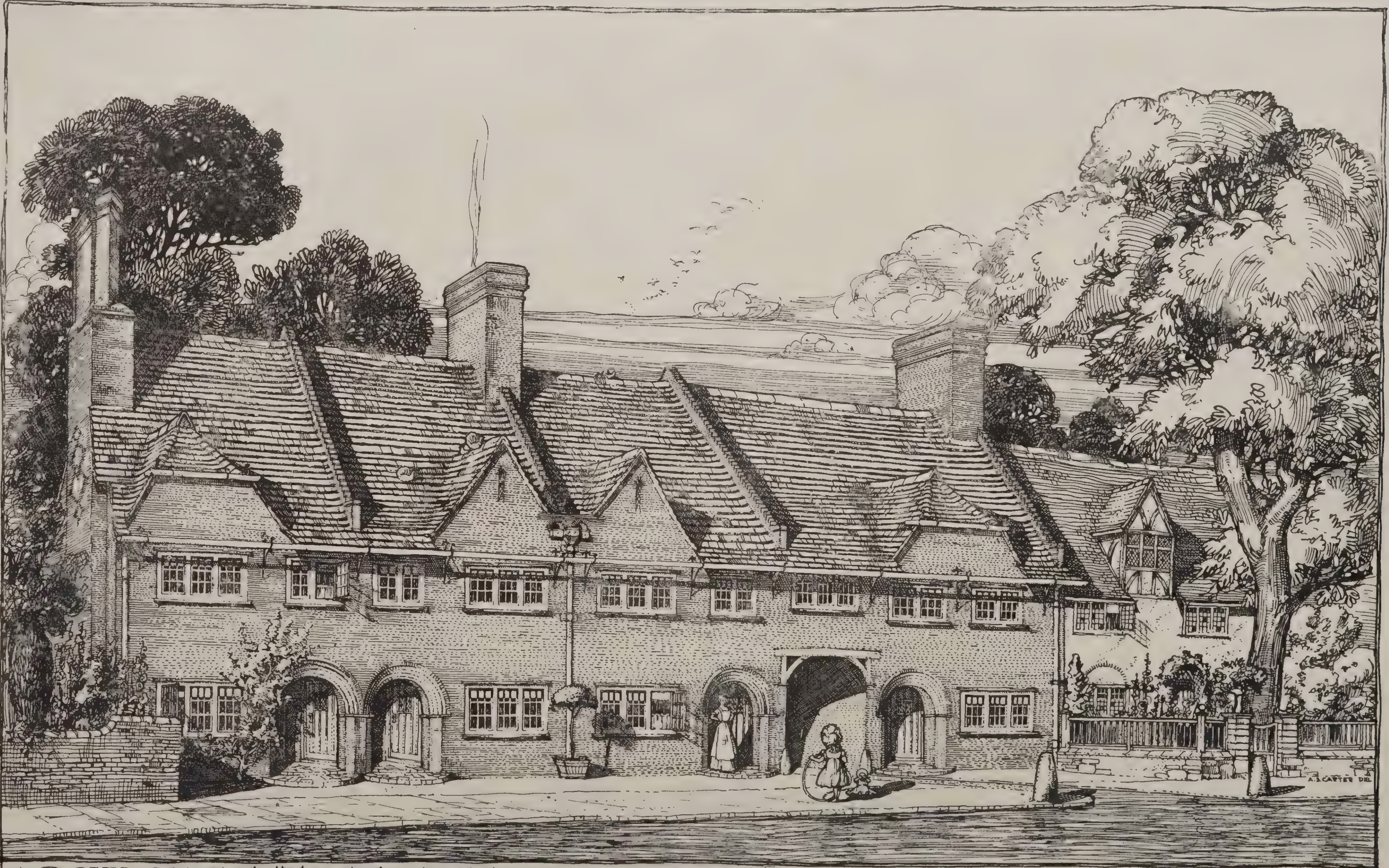
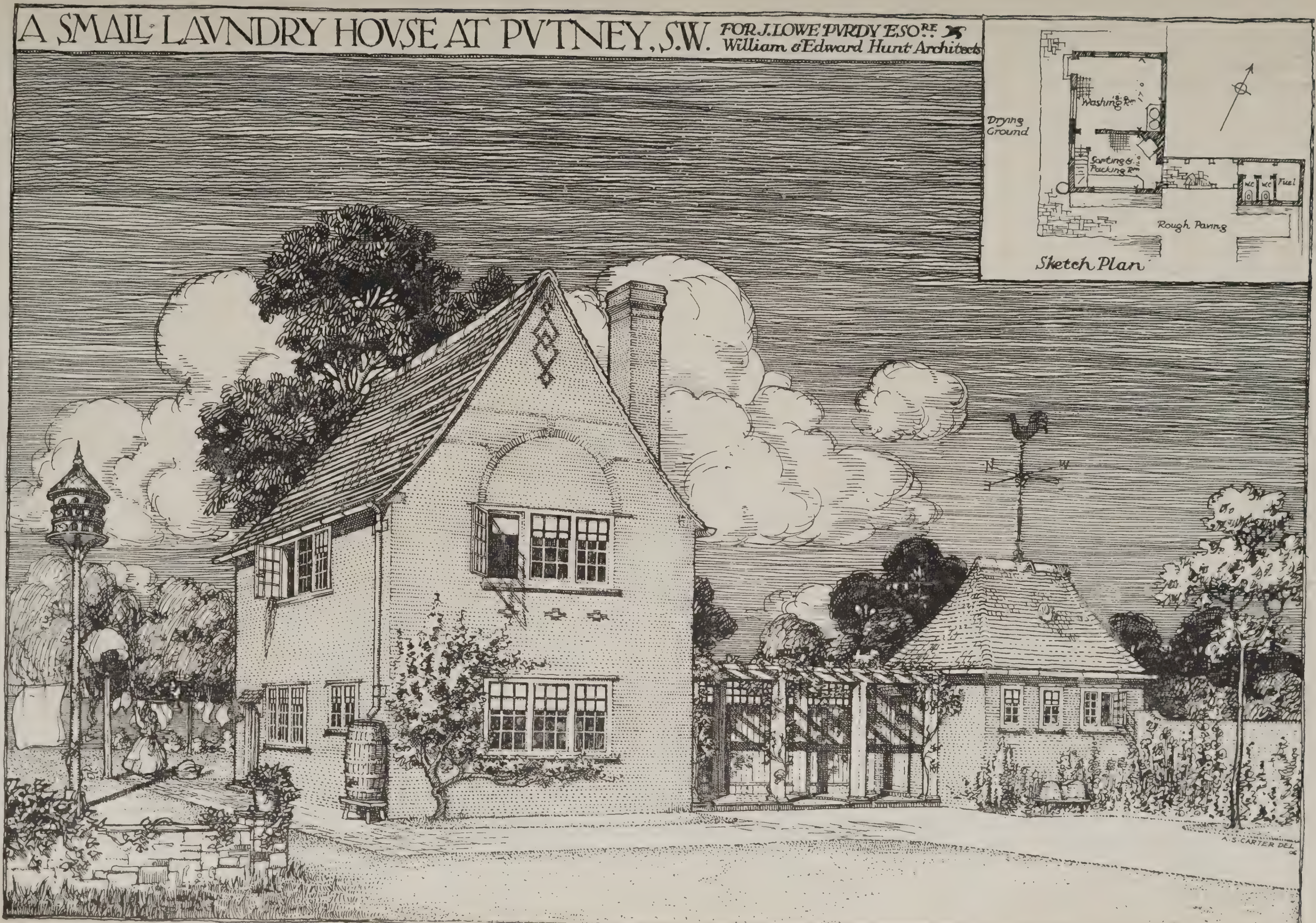
Supplement to
THE BUILDERS' JOURNAL AND ARCHITECTURAL ENGINEER
Wednesday, September 12th, 1906.


A. S. CARTER DEL.

A ROW OF COTTAGE FLATS AT PUTNEY S.W. *for J.L. Purdy Esquire.*

WILLIAM HUNT &
EDWARD HUNT, ARCHITECTS.

The Builders' Journal and Architectural Engineer,
Wednesday, September 12th, 1906.



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Enquiries Answered.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.
The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional, or legal matters.
Correspondents are particularly requested to be as brief as possible.

Porcelain Lined Bath.

LONDON—T. T. writes: "What can be done to renew the polish of a porcelain lined bath, which has all gone after 12 months' use? The enamel seems sound."

We can only suggest burnishing it.

R.I.B.A. Intermediate Examination: Second-hand Architectural Bookseller.

RHYL. — PROBATIONER writes: "(1) Please give list of books required for R.I.B.A. Intermediate Examination. The list given in the R.I.B.A. Kalendar is, I presume, larger than is absolutely necessary. I want to know the minimum that would suffice. (2) Kindly give address of a dealer in second-hand architectural, &c., works."

(1). The R.I.B.A. examination is intended to prove the qualifications of a practical architect intending to practise, and the books recommended in the Kalendar for study contain far less than the minimum of knowledge that should be possessed. Many of the works, it is true, need not be purchased for permanent possession, and a student need not do more than borrow them from a library, but he should certainly read all, and more. The student should purchase the following general works:—Gwilt's Encyclopedia, Hurst's and Molesworth's Pocket Books, Laxton's Price Book, Spier's "Orders," Fletcher's History, Rivington's Building Construction, "Specification," Leaning's "Quantity Surveying" (2). Mr. B. T. Batsford, 94, High Holborn, W.C.

Carving by Machinery.

MANCHESTER writes: "Can you give name and address of firms who do wood carving by machinery?"

The Automatic Sculpture Syndicate, Ltd., 62 and 64, Sumner Street, London, S.E.

Boot Factories.

DUDLEY.—READER writes: "Where can I obtain information on the very latest style of planning and fitting up of boot factories?"

No information appears to have been published upon this subject.

Concreted Market Square.

LONDON.—R. H. W. writes: "A market square in a certain town has been concreted and finished with cement floating, the gauging for concrete being 1 part Portland cement, 3 parts sea shingle, 2 parts sand, and the floating composed of 1 part cement to 1 of sand. Some of the floating is now flaking up, although it was laid before the concrete was set. The cement passed the surveyor's test and the gauging of the above was strictly adhered to. The square is also used as a right of way for all traffic—even traction engines could go across. Would it not have been better to have laid it in one bulk and worked up to a smooth surface?"

If the work was done properly, as stated by you, it should have been satisfactory. It is of vital importance that the top floating coat should be put upon the under-surface of the concrete while the latter is green, and the fact that in this case the top coat has flaked up makes us think that, notwithstanding what you say, the surface of the concrete was allowed to become dry; hence there was no adhesion between the two. The main part of the concrete, however, was poor for such traffic as exists in the market place, and if the floating coat were very thin it would be easily disintegrated. The coating should have been at least about 2ins. thick, and we should have been inclined to have made it 4ins. thick, composed of 1 part Portland cement and 2 parts granite chippings. To have laid the work in bulk in the poor proportions you state would not have been satisfactory, but undoubtedly it would be best to put on the finishing coat before the foundation was quite set.

Laundry Machinery.

MANCHESTER.—C. writes: "Have you ever published plans and description of a modern machine laundry? Also, is there a good book on the subject?"

We have published the working drawings of the laundry at the Camberwell Infirmary in the current issue of "Specification" (price 2s. 6d. nett or 3s. 3d. post free from our offices). The only book we are aware of on the subject is "The Steam Laundry," by J. Taylor (price 7s. 6d. post free from our offices).

Illustrations of Old and New Buildings.

HORSHAM.—CIVIS writes: "Can you tell me where drawings, views, &c., of the following have been published?—Kennel Park Church (Nesfield), Lyndhurst Church, Hampshire, Church at Exeter (Caröe), Church at Wonersh (Harrison Townsend), Westminster Hall, Guildhall, Crosby Hall, Middle Temple Hall, and other Elizabethan Halls in London, Queen's Hall, Leysian Hall (City Road), Colston Hall (Bristol), Battersea Town Hall."

Plates showing drawings of the interior of Middle Temple Hall will be found in Vol. 2 of "Weale's Quarterly Papers on Architecture." Information upon the Elizabethan Halls in London will be found in the following works:—"A Collection of Ancient Timber Edifices of England," J. Clayton; "Architecture of the Renaissance in England," J. A. Gotch; "Mansions of England of Olden Time," J. Nash; "Observations on the Architecture of England during the Reigns of Queen Elizabeth and James I.," and "Architectural Remains of the Reigns of Elizabeth and James I.," Richardson. Illustrations of most of the other buildings you mention have been published in one or other of the building papers. Consult back numbers.

H. Y. M.

Books for Municipal and County Engineers' Examination.

WINCHESTER.—WINTON writes: "I intend reading for the examination of the Incorporated Association of Municipal and County Engineers and should be glad to know what books to get. I specially want a good book on water-works engineering and one on tramway construction. I already have the following:—'Mechanics Applied to Engineering' (Goodman), 'Principles of Planning' (P. L. Marks), 'How to Estimate' (Rea), 'Surveying' (J. Whitelaw, junr.), 'Building Construction' (Henry Adams), 'Building Construction' (Chas. F. Mitchell), 'Specification No. 8,' 'Municipal Engineer's Specification No. 1.'"

We suggest the following:—"The Sewage Problem," by Arthur J. Martin, 7s. 6d.; "Sanitary Engineering," by Colonel Moore, 32s.; "Practical Sanitary Engineering," by Francis Wood, 8s. 6d.; "Municipal and Sanitary Engineers' Handbook," by Boulnois, 15s.; "Destructors and Disposal of House Refuse," by W. H. Maxwell, 17s. 6d.; "New Streets—Laying Out and Making Up," by J. Taylor Allen, 3s. 6d.; "Road-making and Maintenance," by Thos. Aitken, 21s.; "Roads: Their Construction and Maintenance," by Greenwell & Elsden, 5s.; "Sanitary Law and Practice," by Robertson & Porter, 21s.; "Water and its Purification," by S. Rideal, 9s.; "Water-works Distribution," by B. J. M. McPherson, 6s.; "Water Supply Engineering," by A. P. Folwell, 17s. These books can be obtained post free from our offices at the prices given.

Building Trade in Canada.

LONDON.—W.T. writes: "Will you kindly inform me what prospects there are for architects and builders in Canada?"

In recent issues we have replied to numerous enquiries on this subject, and we have no more of our own knowledge to add. We notice, however, a letter from a correspondent in Toronto which appears in our contemporary the *Ironmonger*, setting forth some particulars likely to be of service to the querists who have addressed themselves to us in these columns. The correspondent in question says: "In Toronto this year the building trade is very brisk. In the fortnight ending June 30th last, official permits were granted for the erection of 186 dwellings and other buildings in this city alone at an estimated cost of $636,000 (£127,500). Canadian plumbing is carried out upon the American style, drawn steel and copper down-pipes (nickel-plated) being used in place of lead. Smart one-piece enamelled cast-iron rolled-edge baths are general, and are used without casing. Every decent six-roomed house has its bath-room and water-closet on the first floor, with hot and cold water service, and most of them are also fitted with electric light and gas, and heated with warm air or hot water. The kitchen stove is always the tenant's movable property, but some of the better-class houses have sitting-room fireplaces and log-hearths in addition to their furnace."

INSTITUTE OF SANITARY ENGINEERS.

The following is the syllabus of twenty-five lectures in practical sanitary science and engineering to be delivered at the Institute of Sanitary Engineers, 19, Bloomsbury Square, W.C., during the forthcoming session:—

Oct. 2—Mechanical Physics. N. W. Hoskins.
,, 9 and 16—Building Construction so far as it relates to Sanitation. Geo. W. Chilvers.
,, 23 and 30—Details of Plumbers' Work and Sanitary Appliances. Richard Horton.
Nov. 6—Hydraulics and Hydrostatics. N. W. Hoskins.
,, 13—Sewerage and Drainage. A. J. Martin.
,, 20 and 27—Scavenging and Disposal of Refuse. W. H. Maxwell.
Dec. 4—Water and Water Supply. H. W. G. Macleod.
,, 11—Sewage Disposal. W. J. Dibdin.
,, 18—The Atmosphere and Meteorology. N. W. Hoskins.
1907.
Jan. 8 and 15—Heating and Hot Water Supply to Buildings. A. E. Abbott.
,, 22—Lighting. W. J. Dibdin.
,, 29—Ventilation of Dwellings and Public Buildings. W. H. Maxwell.
Feb. 5—Disinfection and Disinfectants. J. T. Griffin.
,, 12—Roads and Footways. A. J. Martin.
,, 19 and 26—Materials. N. W. Hoskins.
Mar. 5 and 12—Supervision of Works in Progress. Henry Adams.
,, 19—Quantities and Measurement of Sanitary Works. Geo. W. Chilvers.
,, 26 & Apr. 9—Sanitary Law. J. Priestley.

The fee for the course is 21s.

CHELSEA'S NEW BATHS.

How the Artesian Well Was Made.

In connection with the new public baths which are being erected in Manor Street, Chelsea, under the direction of Mr. Alex. McDonald (engineer to the Baths Committee), an artesian well has been bored. It is interesting to give a few particulars of this work. The boring was done by a hand drill, four men being at work, and the lifting of the bored material was effected by a steam winch. The steel bore tube is 13½ins. in diameter and its upper end is encased in a protecting tube 15½ins. in diameter. The work of boring was commenced on September 14th, 1905, and ceased on February 24th, 1906, at a depth of 463ft. 8ins. below the roadway in Manor Street. The average rate of sinking for the whole bore was about 3ft. 5ins. per day, but in the chalk the average rate was 4ft. 3ins. per day. The contract price for the boring was for the first 100ft. 17s. per ft., increasing 1s. per ft. for every 100ft. sunk. The contractors were Messrs. E. C. Potter & Co., Lant Street, Borough, S.E. The water now stands in the boring at a depth of 120ft. from the surface. The total cost of the well with plant complete (not including boilers) will be £1,153. The pump will be supplied by the Rand Drill Co., of New York. It will have a lifting capacity of 12,000 gallons per hour. The total capacity of the storage tanks will be about 120,000 gallons. Work on the erection of the new baths was commenced about June last year and is expected to be completed about next January. The builder is Mr. A. N. Cole, of Plymouth and London, and the engineers are Mesers. Crittall & Co., of London.

WYATT.

St. Peter's Church, Manchester, is being pulled down. A notice of the building appeared recently in the *Manchester Guardian*, in which the architect of the church was spoken of as "Mr. James Wyatt, the Manchester architect." Mr. Charles H. Wyatt, of Chelford, writes pointing out, however, that the architect of St. Peter's must surely have been James Wyatt, R.A., who became almost, if not quite, president of the Royal Academy. "Even his enemies admitted that he was president-elect. He built the mansion at Heaton Park in 1772 for Sir Thomas Egerton (afterwards the first Earl of Wilton), but can hardly be described as a Manchester architect. A *protégé* of Lord Bagot, Ambassador to the Pope, he was taken to Rome to study architecture, where Wyatt made good use of his four years' stay, subsequently spending two years in Venice. Four years later he was elected an Associate of the Royal Academy, and afterwards duly became an Academician. He successfully adapted the old Pantheon in Oxford Street, London, for dramatic performances, and hence rapidly rose in popularity. In 1795 he erected Fonthill Abbey for Mr. Beckford. The great revival of interest in Gothic architecture was largely due to James Wyatt. He was concerned in the restoration of Hereford, Lincoln, Salisbury and Lichfield Cathedrals. It has been well said 'there is scarcely a county or large town in the country in which Wyatt did not erect some public or private building.' He was killed by a carriage accident near Marlborough in his 68th year, and was buried in Westminster Abbey on the 28th of September, 1813."

Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, *Great New Street, Fetter Lane, E.C.*

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Ashburton.—For the erection of villa residences on the Druid Estate, together with entrances and approach roads, for the Ashburton Building Co. Mr. R. Montague Luke, architect, 15, Princess Square, Plymouth:—

White, Chatton & Co., Torquay	£1,989	15	7
J. Coneybeare, Ashburton	1,795	12	1
Yeo & Sons, Torquay	1,732	9	3
Wakeham Bros., Plymouth	1,685	0	0
Drew, Paignton	1,587	0	0
Badcock,* Ashburton	1,525	11	0
Narracott, Stoke Gabriel	1,474	11	6

* Accepted subject to revision.

Barry.—For the erection of public offices, in Holton Road, for the Barry U.D.C.:—

A. Richards	£8,610	0	9
Jones Bros.	8,600	0	0
Lloyd & Tape	8,540	15	10
W. Britton	8,270	0	0
H. S. Rendell	8,050	0	0
E. R. Evans Bros., Cardiff	7,770	0	0
D. Davis & Sons, Cardiff	7,750	0	0
J. Allen & Son, Cardiff	7,701	10	6
D. W. Davies,* Cardiff	7,488	0	0

[Rest of Barry.]

* Accepted subject to the approval of the Local Government Board.

Birkenhead.—For the erection of new head post office for H.M. Office of Works, &c.:—

	York.	Portland.
Waring White Building Co.	£15,574	£15,174
J. Thomas & Sons	14,756	14,417
J. Henshaw & Sons	13,855	14,197
G. L. Desoer	13,655	14 005
I. Dilworth	13,285	13,535
Jones & Sons	13,260	13,365
J. Rothwell & Sons	13,000	13,250
J. Merritt	12 994	13,098
S. Webster	12,979	13,250
J. Patterson & Son	12,897	13,147
W. Thornton & Sons	12,753	12,453
Brown & Backhouse	12,678	12,937
R. Allen	12,180	12,395
H. E. B. Greener & Co,	11,890	12,140
W. H. Forde	11,841	12,068
J. E. Gabbutt*	11,666	11,666
R. Costain & Sons	11,599	11,849

* Accepted.

Bradford.—For the enlargement of the post office for H.M. Office of Works, &c.:—

				Credit.		
J. Schofield & Son	£9,863	0	0	£ 50	0	0
M. Booth & Sons	9,400	0	0	134	0	0
J. Moulson & Son	8,840	0	0	55	0	0
C. Murgatroyd & Son	7,958	0	0	150	0	0
E. Fearnley & Sons	7,500	0	0	100	0	0
W. Farnish*	7,390	0	0	125	0	0
J. Arundel	6,380	15	0	70	8	6

*Accepted.

Claygate (Surrey).—For the erection of eight shops, for Mr. W. Martin. Mr. S. C. Hart, architect, 22, Philpot Lane, London, E.C.:—

Shellard	£4,200
West	4,075
Doughty	3,860
Matthew & Co., Enfield Wash*	3,820
Brown & Co.	3,804

* Accepted.

Derby.—For the enlargement of the Midland Road branch post office, for H.M. Office of Works, &c.:—

		Credit
E. Brown & Son	£3,237	£28
J. Young	3,190	20
J. Barnsley & Sons	3,148	40
Walker & Slater, Derby*	3,134	35

*Accepted.

Hereford.—For taking down three old cottages, Nos. 86, 87 and 88, Widemarsh Street, and erecting three new cottages on the site, for Mr. W. D. Davis. Mr. H. Skyrme, architect, 138, Widemarsh Street, Hereford. Quantities by architect:—

W. P. Lewis & Co.	£844
Wm. Powell	739
Edwin Cooke	735
Evan Davies*	720

(All of Hereford.)

* Accepted.

Hull.—For the erection of new post office for H.M. Office of Works, &c.:—

G. L. Scott	£52,997
G. H. Panton	49,900
Quibell, Son, & Greenwood	41,804
J. T. Levitt	41,654
G. Houlton	39,200
W. G. Padgett	38,720
T. Goates	38,315
Wright & Sons	38,150
G. H. Scorrer	37,954
T. Marsden & Sons	37,750
Dawber, Townsley & Co.	37,750
Bowman & Sons	36,595
H. Arnold & Son*	30,275

* Accepted.

London, N.—Accepted for alterations at additional workhouse, Hazelville Road, Hornsey Rise, for St. Leonard (Shoreditch) Guardians. Mr. F. J. Smith, architect, Parliament Mansions, Victoria Street, S.W.:—

J. Ivory, 102, Great Cambridge St., E.	£1,837

North Berwick.—For the erection of a new post office, for H.M. Office of Works, &c.:—

				Credit.		
J. Wilson & Sons	£3,999	0	0	£20	0	0
J. Parkinson & Sons	3,628	0	0	—		
J. Muirhead	3,478	10	10	20	0	0
S. Beattie & Sons	3,265	0	0	10	0	0
Denholm & Murray	3,161	0	0	13	0	0
P. Barton	3,000	0	0	—		
A. H. Hunter & Co.	2,994	10	0	—		
Scott & Brown	2,878	14	0	10	0	0
J. Elliott	2,801	16	0	3	0	0
J. & R. Stewart	2,795	0	0	10	0	0
A. Calder	2,791	0	0	—		
J. & F. Forrest	2,780	3	0	—		
N. McLeod & Sons	2,763	0	0	15	0	0
Baikie & Peattie	2,779	8	8	32	8	8
J. Angus*	2,769	10	0	40	0	0

* Accepted.

Peterborough.—For the erection of new elementary school and cookery centre at Brook Street, for the local Education Authority. Messrs. J. G. Stallebrass & Sons, architects, North Street, Peterborough:—

J. Cracknell	£5,534	0	0
E. W. Beech	4,950	0	0
H. Watson	4,849	0	0
R. Shanks	4,790	0	0
J. Guttridge	4,774	0	0
G. Heath	4,712	10	0
D. Gray	4,712	10	0
J. Lucas	4,649	0	0
J. Bridgefoot	4,631	18	0
J. Hicks,* Peterborough	4,544	18	0

*Accepted.

Architects' estimate, £4,900.

Ruabon.—For the construction of storage tank in cement concrete and enlargement of ejector chamber, for the Wrexham R.D.C. Mr. J. Price Evans, engineer, C.E, Argyle Chambers, Wrexham:—

S. Moss, Coedpoeth, Wrexham	£1,696	4	9
Holme & King, Liverpool	1,663	16	9
Davies Bros., Wrexham	1,527	17	0
Tysilio, Jones & Sons, Johnstown, Ruabon	1,526	0	0
J. H. Simmons, Gwersyllt, Wrexham	1,410	16	11
T. Ll. Davies, Rhos, Ruabon	1,372	17	7
J. T. Jones, Cefn, Ruabon	1,343	12	2
R. Williams, Brymbo, Wrexham	1,313	10	4
I. Jenkins, Johnstown,* Ruabon	1,270	12	3

*Accepted.

Sunderland.—For the erection of Board of Trade and Customs offices, for H.M. Office of Works, &c.:—

		Credit.
S. F. Davidson	£6,499	£—
H. W. Lowry	5,620	—
W. B. Cooper	5,558	50
J. C. Ferguson	5,389	—
J. B. Stott	5,346	20
D. & J. Ranken	5,224	25
T. Lumsden	4,840	40
J. W. White	4,778	—
Middlemiss Bros.	4,584	20
J. Armitage	4,450	—
J. M. Wright	4,297	—
J. Huntley	4,285	50
S. Warburton*	4,000	80

*Accepted.

Corrections.—In the list of tenders for the new depot buildings in Mill Street, Maidstone, published on page xvi. of our issue for last week, the name of Messrs. G. E. Wallis & Sons, of Piccadilly, W., was incorrectly spelt "Wallace"—In the list of tenders for the erection of a pair of cottages at Starveall Farm, Charfield, Glos., on page xxv. of our issue for August 29th, the address of Mr. J. Brown was incorrectly given as Bristol: it should be Sharpness.

Bankruptcies.

Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—adjudication.

DURING THE WEEK ending Sept. 7th, eighteen failures in the building and timber trades in England and Wales were gazetted.

A. Cox, joiner, Burnley. R.O., Aug. 29.

E. LARKINGS, builder, Putney. R.O., Aug. 29.

E. CHAMBERS, joiner, Kimberley. R.O., Aug. 31.

W. CROFT, carpenter, Sherborne. R.O., Aug 28.

T. W. NEWBERRY, carpenter, Wisbech. Adj., Aug. 29.

DYER & TAYLOR, builders and contractors, Halifax. Adj., Aug. 31.

A. PORTER, builder and contractor, Ewerby. Liabilities, £169; assets, £22.

J. MOIR, timber merchant, London, E.C. Total liabilities, £7,642: £4,105 to rank; assets, £1,374.

P. CARROLL, builder and contractor, Liverpool. Liabilities, £773; assets, £519. P.E., adjd. till Oct. 1.

PORTABLE APPLIANCES Co. (T. S S. James), Newark. Gross liabilities, £887; £853 to rank for dividend; assets, £214; deficiency, £639.

R. W. BROWN & SON, builders, Leicester. R.O., Aug. 30. First Meeting, O.R.'s, Leicester, Sept. 12, at 12. P.E., The Castle, Leicester, Oct. 5, at 10.

J. JOHNSON, builder and decorator, Mitcham. First meeting, 132, York Road, London, S.E., Sept. 14. at 11.30. P.E., Croydon C.C., Nov. 7, at 11.

LONGCAKE & CLEMINSON, plumbers and glaziers, Leeds. R.O., Aug. 28. First meeting, O.R.'s, Leeds, Sept. 12, at 11. P.E., Leeds C.C., Oct. 16, at 11

WILKINSON BROTHERS, builders and contractors, London. R.O., Aug. 29. First meeting, Bankruptcy Court, Sept. 12, at 11. P.E., same. Oct. 30, at 12.

R. WHITEHEAD, slater, plasterer, &c., Rough Bank, near Newhey. First meeting, Rochdale Town Hall, Sept. 13, at 4. P.E., Lecture Hall, Rochdale, Sept. 14, at 11.15.

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Electrical Notes.

Standard Specification for Conduits.

In former issues we have drawn attention to the excellent work being done by the Engineering Standards Committee towards establishing British standard specifications for various kinds of work. They have now issued a standard specification for steel conduits for electrical wiring. The desirability of standardising these conduits was brought to the notice of the sub committee on Electrical Plant Accessories in February last, and the manufacturers of steel conduits accepted the invitation of the committee to give evidence on the subject. A sectional committee on screw threads and limit gauges was also consulted with regard to the question of threads, the clauses in the specification dealing with gauging being based on the recommendations of that committee. The chairman of the sub-committee was Mr. C. H. Wordingham, and besides representatives of the Admiralty, War Office, Board of Trade, &c., there were two representatives nominated by the National Electrical Manufacturers' Association, and a number of other specialists whose names are well known in the electrical world. The committee, therefore, was a thoroughly representative and influential one. The specification states that steel conduits for electrical wiring shall be either close-joint, brazed, welded or solid drawn, and stove enamelled or galvanized inside and out. There are to be two classes—namely, plain and screwed, both made in straight lengths of 10, 12, or 14ft. and of specified thicknesses, the average thickness to be determined by weighing not less than 100ft. Three classes of screwed gauges are recognised—namely, standard screwed gauges, reference screwed gauges, and shop screwed gauges. The specification can be obtained from Messrs. Crosby Lockwood & Son, 7, Stationers' Hall Court, Ludgate Hill, E.C., price 2s. 6d. nett.

Electric Radiators.

A very effective-looking electric radiator has been put on the market by the Carron Co., the well-known fire-grate makers of Carron, Stirlingshire. It comprises an ornamental cast-iron front and top with four heating lamps connected in circuits of two lamps and controlled by separate switches. The maximum consumption per hour is 1·06 B.T. units, and the minimum ·53 units, while the lamps will burn 1,000 hours without renewal. The price of the radiator is just over £5.

Precautions while Painting Electrical Work.

A workman while engaged recently in painting the standards for the electric trams at Newport, Mon., received a severe shock, and had to be removed to the hospital, where it was found that his arm was somewhat burnt. The mishap was said to be due to a leakage from the trolley wire. The occurrence, says the *Decorator*, suggests the advisability of painters who are engaged on electrical works taking measures to prevent injury in cases of this kind. Usually there is no danger to be apprehended by painters if they take care not to touch the trolley wires, but when working close to them, it is advisable to use rubber gloves, especially on the hand used for steadying—namely, the left, and this, of course, leaves the right hand free to hold the brush. Mr. S. B. Cotterell, engineer and manager of the Liverpool overhead railway, has issued a paper on this matter. He says: "If ordinary caution is observed in handling electric cables, wires, or apparatus, no danger need be apprehended. Regard any apparatus with which you may have to deal as capable of affording a shock, and adopt precautions accordingly. When it is necessary to touch part of such apparatus when the current is active, the individual should be careful that his entire person is insulated from the earth, and from anything, other than an insulating medium, which connects with the earth. This may be best achieved by standing on an india-rubber mat. On no account should he touch parts of the machinery, cables, or apparatus with both hands at the same time, unless his hands are protected by sound india-rubber gloves. Shoes with india-rubber soles may be worn as an extra precaution, but the wearer must never rely upon them for insulation."

A Public Laboratory Museum.

Next month a Laboratory Museum of Electricity will be opened to the public at Brussels. Its object is the development and extension of the use and application of electricity in Belgium by practical experimental instruction. The institution will contain all kinds of electrical models and appliances, which may be freely handled for study and experiment. Models and apparatus will be conveniently placed at the disposal of the public upon separate tables, and may be connected with the electric supply at will. There will also be free telegraph, wireless telegraph and telephone offices.

NOTE.—There are things one cannot forget. One is that "ROYAL EDISWAN" LAMPS are BEST and CHEAPEST in the END.

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Complete List of Contracts Open.

WITH a few exceptions, news of Contracts Open are not repeated after they have been published once in these columns, so that readers will find particulars in our previous issues of other contracts that still remain open.

Unless expressly stated to the contrary, all deposits required for bills of quantities, &c., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair-wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

Sept. 13. Fetteresso.—*Erection of house* for overseer, and steading of offices at Home Farm, Fetteresso. Plans and specifications may be seen with Alexander Forbes, Fetteresso Estate Offices, 12, Ann Street, Stonehaven, who will receive tenders for the works up to Sept. 13.

Sept. 13. Ruislip.—*Construction of a brick wall about 333 yards in length* to Ruislip Churchyard. Plans and specifications may be seen and examined at the Manor Farm, Ruislip. Sealed tenders, endorsed "Tender for Wall," to be delivered to H. J. Ewer, The Manor Farm, Ruislip, not later than midday, Sept. 13.

Sept. 13. Abersychan.—*Alterations and improvements at Abersychan Council School and at the Park Street Boys' School, Blaenavon.* Plans and specification can be seen at the offices of Mr. H. J. Griggs, architect, Newport, Mon. Tenders endorsed "Abersychan School" and "Park Street School" respectively, to be sent to Henry Bythway, clerk to the managers, Pontypool, by noon Sept. 13.

Sept. 15. Bargoed.—*Erection of a vestry* for the Welsh Baptist denomination. Tenders to be sent in to Mr. Mark Old, 20, Henry Street, Bargoed, on or before Sept. 15. Plans and specifications may be seen with the above or with P. Vivian Jones, P.A.S.I., architect and surveyor, Hengoed.

Sept. 15. Dowlais.—*Erection of 38 workmen's houses* at Penywern. Plans may be inspected and specifications obtained at the office of the Borough Surveyor, Merthyr Tydfil, on payment of £1 1s., which will be returned upon receipt of a bona fide tender. Tenders marked "Penywern Houses" must be delivered to T. Aneuryn Rees, town clerk, Town Hall, Merthyr Tydfil, on or before Sept. 15.

Sept. 15. Hounslow.—*Erection of a new infants' school at Spring Grove*, to accommodate 350 children, for the Heston and Isleworth U.D. Education Committee. The plans may be inspected at the office of A. Lang, architect, Council House, Hounslow, where also bills of quantities may be obtained, together with specification and form of tender, on payment of a deposit of £2 2s. Tenders on the forms supplied, to be delivered to H. J. Baker, clerk to the committee, Council House, Hounslow, not later than 12 noon on Sept. 15, endorsed "Tender for Spring Grove Infants School."

Sept. 17. Gwauncacgurwen.—*Erection of a new C.M. chapel.* Plans and specifications may be seen and bills of quantities obtained at Anchor House, Cwmgorse, upon the receipt of £2 2s., which will be refunded upon receipt of a bona fide tender. Tenders to be delivered to the Secretary, David Jones, Anchor House, Cwmgorse, not later than Sept. 17.

Sept. 17. West Bromwich.—*Repairs, painting, and other work*, at the district schools, Wigmore, West Bromwich. Specification and conditions of contract may be seen and forms of tender obtained at the office of Mr. John W. Allen, architect, High Street, West Bromwich. Tenders, under seal, marked "Repairs, Painting, &c.," must be sent to H. Ward, clerk, Church Street, West Bromwich, on or before Sept 17.

Sept. 17. Portsmouth.—*Pulling down a chimney shaft* about 75ft. high in the Asylum Grounds at Milton. The contractor will be required to erect scaffolding and supply plant, to carefully take down chimney, and clean and stack the old material (which is to remain the property of the Committee of Visitors) upon a site about 107yds. distant from the chimney, and cart away the old mortar and other débris. Fair wages clause. Tenders endorsed "Tender for Pulling Down Chimney Shaft," to be delivered at the Town Hall, Portsmouth, not later than 10 a.m. on Sept. 17.

Sept. 17. Gainsborough.—*Pulling down and rebuilding premises in Bridge Street*, Gainsborough, belonging to the Gainsborough Industrial Co-operative Society, Ltd. Bills of quantities and form of tender may be had on application to Scorn and Gamble, architects, Bank Street Chambers, Lincoln, on or before Sept. 5 and on payment of £2 2s. The drawings and conditions of contract may be inspected at the offices of the architects. Tenders must be delivered to the manager at the office of the Society, 11, Bridge Street, Gainsborough, and in the envelope provided for the purpose, before 10 a.m. on Sept. 17.

Sept. 17. Maesteg, &c.—(1) *Alterations and additions* at the Blaenllynfi Council School, Caerau, near Maesteg. (2) New temporary cookery and infants' school at the Troedrhiwfuwch Council School. (3) New classrooms to the mixed department at Ely Council School. (4) Minor alterations and additions at Pontyrhyl Council School. Quantities and specification may be obtained for (1) at the Caerau Police Station, Maesteg; for (2) at the Pontlottyn Police Station; and for (3) from T. Mansel Franklen, clerk of the Glamorgan County Council, Glamorgan County Offices, Westgate Street, Cardiff, to whom tenders, made out on the form supplied, including the names of two substantial sureties, are to be delivered not later than Sept. 17th.

Sept. 17. Swaffham.—*Builders' repairs* required to be done at the Workhouse during the ensuing half-year. Tenders should be delivered at the Workhouse. Swaffham, addressed to S. Matthews, clerk to the Guardians, before 11 a.m on Sept. 17. Forms of tender containing the conditions of the contract to be signed, and full particulars, may be obtained from the Master of the Workhouse or S. Matthews.

Sept. 18. Durham.—*Erection of new schools at Eldon Lane and Sedgefield.* Plans, specifications, and conditions of contract and bills of quantities can be seen as follows:—For Eldon Lane, at the office of Messrs. Vaux & Mark, architects, 29. Norfolk Street. Sunderland; for Sedgefield, at the office of the Education Committee's Architect, Shire Hall, Durham. Sealed tenders endorsed "Eldon Lane (or Sedgefield) Council School Tender," are to be sent on or before Tuesday, Sept. 18, addressed to the Secretary for Elementary Education, Shire Hall, Durham.

Sept. 18. Tottenham. — *Extension to the Central Public Library*, Tottenham. Plans can be seen and conditions, specifications, bills of quantities, schedule of prices and forms of tender obtained on application to W. H. Prescott, A.M.Inst.C.E., engineer to the Council, at the offices, Council Buildings, The Green, Tottenham. The sum of 10s. 6d. will be charged for the quantities, which will be returned on receipt of a bona fide tender, accompanied by the conditions, specification, and quantities, otherwise the deposit will be forfeited. Sealed tenders on the form supplied, endorsed "Tender for Extensions to Central Public Library," to be delivered to Edward Crowne, clerk of the Council, by noon on Sept. 18. Fair wages clause.

Sept. 18. London, S.E.—*Erecting a public convenience and bath houses* at Bell Green, Lower Sydenham. Drawings, specification, and form of contract can be seen, and a copy of the drawings, specification, and form of tender may be obtained at the Town Hall, Catford (Surveyor's Department), on payment of a deposit of £5. The tenders must be on forms issued by the Council, enclosed in an envelope, sealed and endorsed "Tender for Convenience and Bath Houses," and must be delivered by 4 o'clock on Sept. 18 at the Town Hall, and placed in the box there provided for the purpose. The work must be proceeded with immediately on obtaining the Borough Surveyor's order to commence the work, and the contractor must employ local labour as far as practicable in carrying out the work. Fair wages clause.

Sept. 19. Rotherham.—*Laundry machinery and fittings required at the Public Baths; also structural alterations.* Plans and specifications may be seen and further particulars obtained on applying at the offices of J. Platts, Corporation architect. Tenders endorsed "Laundry Machinery for Baths" to be sent to W. J. Board, town clerk, Town Hall, Rotherham, not later than Sept. 19. Fair wages clause.

Sept. 19. Leeds.—*Enlargement of the branch post office, Chapeltown, Leeds.* Drawings, specification, and a copy of the conditions and form of contract may be seen on application to the Postmaster. Bills of quantities and forms of tender may be obtained at H.M. Office of Works, etc. on payment of £1 1s. Tenders must be delivered before twelve o'clock noon on September 19, addressed to the Secretary, H.M. Office of Works, etc., Storey's Gate, London, S.W., and endorsed "Tender for enlargement Chapeltown Branch Post Office, Leeds."

Sept. 19. Liverpool.—*Erection of new washhouse*, clothes store, boundary walls, &c., at the Lower Hospital. Mill Road Infirmary, for the West Derby Guardians (local contractors). Quantities can be obtained from Harris P. Cleaver, clerk to the Guardians, Brougham Terrace, West Derby Road, Liverpool, on payment of £1 1s., to be returned on receipt of a bona fide tender. Specifications and drawings can be seen at the office of the architect, Mr. C. H. Lancaster, Brougham Terrace, West Derby Road, Liverpool. Sealed tenders, endorsed "Tender for Additions to Lower Hospital," and addressed to the Clerk, must be delivered not later than 9 a.m. on Sept. 19.

Sept. 19. Westhoughton.—*Brickwork foundations, &c., in connection with the construction of pipe troughs over certain railways in Westhoughton* for the borough of Leigh. The contract will also include the erection of the iron and steel work. Further particulars, together with specifications and form of tender, may be had and detail drawings seen at the offices of J. Gibson, gas and water engineer. Sealed and endorsed tenders to be addressed to Stanley Wilson, town clerk, Town Hall, Leigh, Lancashire, and delivered not later than Sept. 19.

Sept. 20. Fittleworth (Sussex).—*Erection of a cottage.* Plans and specification may be seen with William Buck, architect, Horsham, from 10 to 5. Tenders to be sent in to same not later than noon on Sept. 22, sealed and endorsed "Tender for Cottage at Fittleworth.

Sept. 20. Hull.—*Erection of school buildings* in Selby Street West. Drawings and specification may be seen with Joseph H. Hirst, city architect, Town Hall, Hull, and quantities obtained upon a deposit of £2 2s., which sum will be returned upon receipt of a bona fide tender. Tenders, sealed and endorsed "Selby Street West School," are to be addressed to the Secretary of Education, and delivered at the Education Offices, Hull, before 10 o'clock on Sept. 20.

Sept. 20. Foxearth.—*Erection of new offices*, &c., at the Foxearth Brewery, for Messrs. D. Ward & Son. Plans and specification may be seen at the offices of A. Ainsworth Hunt, architect, Sudbury and Bury St. Edmund's, to whom tenders must be delivered on or before Sept. 20.

Sept. 21. Rhydfendigaid. — *Reconstructing Calvinistic Methodist Chapel.* Plans and specifications may be seen with J. Arthur Jones, architect, Cambrian Chambers, Aberystwyth, or upon application to Mr. J. Rees, Council Schoolhouse, Pontrhydfendigaid, to whom sealed tenders are to be delivered not later than Sept. 21.

Sept. 21. London, N.—*Erection of a new sorting office* at Mill Hill, N. Drawings, specifications, and a copy of the conditions and form of contract may be seen on application to Mr. J. Wager, H.M. Office of Works, Westminster. Bills of quantities and forms of tender may be obtained from the Secretary on payment of one guinea, and tenders to be delivered to him before 12 noon on Sept. 21, endorsed "Tender for Mill Hill Sorting Office."

Sept. 21. London, W.—*Re-erection of a lodge* at Wormwood Scrubs, W., for the L.C.C. Drawings may be inspected, and specifications, bills of quantities, form of tender, and other particulars obtained at the Architect's Department, 15, Pall Mall East, S.W., upon payment of 10s., which amount will be returned to the tenderer, provided he shall have sent in a bona fide tender. Fair wages clause. Tenders to be delivered at the County Hall, addressed to the Clerk of the London County Council, Spring Gardens, S.W., and marked "Tender for the Re-erection of a Lodge at Wormwood Scrubs," not later than 10 a.m. on Sept. 21.

Sept. 21. London, E.—*Repairs, &c., at the mansion in the Island Gardens, Poplar*, for the L.C C. Drawings may be inspected, and specifications, bills of quantities, form of tender, and other particulars obtained at the Architect's Department, 15, Pall Mall East, S.W., upon payment of 10s., which amount will be returned to the tenderer, provided he shall have sent in a bona fide tender. Fair wages clause. Tenders to be delivered at the County Hall, addressed to the Clerk of the London County Council, Spring Gardens, S.W., and marked "Tender for Repairs, &c., at the Mansion, The Island Gardens," not later than 10 a.m. on Sept. 21.

Sept. 22. Newcastle-on-Tyne.—*Erection of a register office* for Superintendent Registrar, also for alterations to the Union Offices, Pilgrim Street. Names to be sent in by Sept. 22, to James Atkinson, clerk to the Guardians, Union Offices, 127, Pilgrim Street, Newcastle-upon-Tyne. Quantities will be forwarded in due course by the architect, Mr. A. Stockwell, 11, Pilgrim Street, Newcastle, at whose office the plans may be inspected and any further information obtained.

Sept. 24. Raskelf.—*Erection of a farm house* at Cold Harbour, Raskelf, near Easingwold, for the Ecclesiastical Commissioners. Plans and specifications may be seen and quantities obtained with Thomas Stokes, architect, Thirsk, to whom tenders must be delivered not later than 10 a.m. on Sept. 24.

Sept. 24. Altwen.—*Erection of two shops* at Altwen for the Altwen and Pontardawe Co-operative Society, Ltd. Persons desirous of tendering can see plans, details, specification, and obtain all particulars at the offices of the architect, Herbert Street, Pontardawe, or Wind Street, Swansea. Tenders to be sent in to the secretary, Mr. Walters, Altwen, near Pontardawe, on or before Sept, 24

Sept. 25. Eyrecourt (Co. Galway).—*Erection of new schools* in Eyrecourt and Woodford, Co. Galway, for the Sisters of Mercy. Plans and specifications can be seen at the Convents of Mercy, Eyrecourt and Woodford, and at the office of William H. Byrne & Son, architects, 20, Suffolk Street, Dublin. Tenders to be sent in by Sept. 25.

Sept. 25. Redruth. — *Erection of a new Secondary School* at Redruth, according to plans and specifications prepared by Mr. Morley Collins, architect, Clinton Road, Redruth, at whose office the plans may be seen and all information obtained. Sealed endorsed tenders to be sent to F. R. Pascoe, secretary, Education Office, Truro, on or before Tuesday, Sept. 25.

Sept. 25. Brighton.—*Conversion of two rooms into one room* at The Warren Farm Schools, Rottingdean. Copy of specification and form of tender, together with any further information, can be obtained on application to Mr. E. Wright, architect to the Guardians, at the Parochial Offices, Prince's Street, Brighton, where plans may also be inspected. Sealed tenders endorsed "Tender for Conversion of Day Rooms," are to be addressed to B. Burfield, clerk to the Guardians, and delivered at the Parochial Offices by 10 a.m. on Sept. 25.

Sept. 27. London, E. — *Additions and alterations in the building at the Electricity Works*, Osborn Street, Whitechapel, E. Persons tendering must submit the names and addresses of two substantial persons willing to be jointly and severally bound for the due and proper performance of the contract. Fair wages clause. The drawings may be seen and copies of the stipulations, specification, schedule, and form of tender may be obtained by applying to M. W. Jameson, A.M.Inst.C.E., borough engineer, 15, Great Alie Street, Whitechapel, E., between the hours of 10 a.m. and 12 noon, upon paying £5. Tenders, endorsed "Tenders for Additions to Electricity Buildings," should be sent to G. W. Clarke, town clerk, 15, Great Alie Street, Whitechapel. E., in the envelopes supplied, so as arrive at this office on before 12 o'clock noon on Sept. 27.

Sept. 27. Dewsbury.—*Erection of extensions to the infirmary at the workhouse.* Plans and specifications may be seen, and bills of quantities obtained, at the offices of Holtom & Fox, architects, Corporation Street, Dewsbury, on and after Sept. 15. Sealed tenders, endorsed "Infirmary Extensions," must be left at the Union Offices, not later than Sept. 27 and such tenders will be opened and considered by the Guardians on Sept. 28.

Oct. 2. Christiania, (Norway)—*Supply and erection of a signal and point lever box at Hundalen station* on the Ofoten railway (one of the Norwegian State Railways). Tenders through agent residing in Norway to be delivered not later than Oct. 2. Apply, 10 kr. deposit, "Driftsbestyrerens Kontor, Narvik."

Oct. 3. Devizes.—*Erection of shedding*, and the whole of the other necessary works in connection with the show yard for the meeting of the Wiltshire Agricultural Association, to be held at Devizes in 1907. Specifications of the work required and forms of tender may be obtained of the Secretary of the Association, Market Lavington, Devizes, on payment of one guinea, which amount will be refunded upon receipt of a bona fide tender. Tenders to be delivered by 10 a.m. on Oct. 3, sealed and endorsed "Tender for Shedding," to the Secretary.

Oct. 4. Levenshulme. — *Erection of new Technical School*, at the rear of the Chapel Street Council School, Chapel Street, Levenshulme. Specifications, bills of quantities, and further particulars may be obtained on application to the architect, Mr. Henry Littler, 16, Ribblesdale Place, Preston, on payment of £3 3s., which will be returned on receipt of a *bona fide* tender. Tenders, endorsed "Tender for new Technical School," to be sent on or before Oct. 4, to J. Ogden Hardicker, clerk, Northern Assurance Buildings, Albert Square, Manchester.

No date. Waddington. — *Additions* to the Wesleyan Church and School, Waddington, near Clitheroe Quantities can be obtained from the architects, Messrs. Potts, Son & Hennings, St. George's Road, Bolton, on depositing £1 1s., which will be returned on receipt of a bona fide tender.

ENGINEERING.

Sept. 13. Chepstow.—(1) *Hot water supply* and (2) electric lighting. Plans and specifications for (1) may be obtained on application to the architects, Messrs. Halliday & Rodger, 14, High Street, Cardiff; and for (2) at the Clerk of Works Office, Workhouse, Chepstow. Tenders to be sent to the architects on or before Sept. 13.

Sept. 15. Handsworth.—*Supply and fixing* of the following for the Urban District Council:—Wiring, fittings, &c., for the electric lighting of the new Council schools, Canterbury Road, Handsworth; wiring, fittings, &c., for the electric lighting of the new Council schools, Westminster Road, Handsworth. Drawings, specifications, and conditions of contract may be obtained on and after Saturday, Sept. 1, from F. A. Nixon, electrical engineer, Generating Station, Soho Road, Handsworth, on payment on £1 1s, All drawings, specification and conditions of contract must be forwarded with tender. Tenders, on the prescribed form, must be forwarded in the endorsed envelope supplied for that purpose, and should be delivered at the Education Offices not later than Sept. 15. Fair wages clause.

Sept. 17. Sofia (Bulgaria).—*Construction of the Devna-Dobritch railway*, length 76½ kilometres. Deposit, 275,000 frs. Specifications and particulars can be obtained at the offices of Minister of Public Works, Sofia. Tenders should be sent in not later than Sept. 17.

Sept. 17. Gowerton.—*Heating* Council School with low-pressure hot water, for the Glamorgan County Council. Quantities and specification may be obtained from the Gowerton Police Station. Tenders to be delivered by Sept. 17, to T. Mansel Franklen, Glamorgan County Offices, Westgate Street, Cardiff.

Sept. 17. Birmingham.—*Widening* of Lancaster Street canal bridge for the Tramways Committee. Drawings and specification may be inspected and quantities and forms of tender obtained on deposit of £1 (which will be returned on receipt of a bona fide tender) from Henry E. Stilgoe, M.I.C.E., city engineer and surveyor, The Council House, Birmingham, to whom tenders, endorsed "Lancaster Street Bridge," re to be delivered on or before Sept. 17. Fair wages clause.

Sept. 17. Hull.—*Diversion of the passenger lines for a distance of about 1 mile, and the construction of a group of marshalling sidings at Dairycoates*, Hull, for the Directors of the North Eastern Railway. Plans may be seen, and specification, detailed quantities, and form of tender obtained, on personal application at the office of W. J. Cudworth, the company's engineer, at York. Sealed tenders, maaked "Tender for Dairycoates New Sidings," to be sent to the secretary at York not later than noon on Sept. 17.

Sept. 17. Oxford.—*Reconstruction, extension, and electrical equipment of the existing horse tramways* in the City of Oxford and the leasing thereof. Proposals based upon the overhead system of electric tramways will not be considered. The conditions of tender may be obtained from R. Bacon, town clerk, Town Hall, Oxford, on deposit of Bank of England notes to the value of £100. Tenders must be addressed to the Town Clerk, in sealed packets, endorsed "Tender of Tramways," and delivered at his office in the Town Hall, Oxford, on or before Sept. 17.

Sept. 19. Leigh-on-Sea.—*Carting, excavating for, laying, jointing, and completing 776 lin. yards or thereabouts of 4ins. dia. and 100 lin. yards of 3 ins. dia. cast-iron gas mains* for Hadleigh Road, Station Road, and Victoria Drive, for the U.D.C. Gas Department. Quantities may be obtained and plans and specifications seen on application to J. W. Liversedge, C.E., Surveyor to the Council. Tenders to be signed, sealed, and delivered to the Council, Carlyle Croasdell, on or before Sept. 19, endorsed "Tender for Gas Mains."

Sept. 24. Jassy—Roumania.—*Water supply and sewerage of the City of Jassy.*—The estimated cost is as follows: Water Supply: For Earthworks, Subterranean Galleries, c., 271,486.40f.; Iron Mains, &c., from the source to the City, a distance of 91 kilometres, 6,470,000.00f.; Distribution in the City, 1,159,914.79f.; for Reservoirs in the City, 646,000.00f.; Total, 8,547,401.19f. Sewerage: For Main Sewers, Gullies, &c., total, 1,887,607.20f. The works will be let in one contract only, but separate tenders must be submitted for each work, showing the percentage over or under schedule prices. A guarantee of 4 per cent. of the total value must be deposited with the tenders, and an additional 2 per cent. on the signing of the contract. Payments will be made monthly in Roumanian money, on materials delivered and works completed. Plans and specifications may be seen, and all further information obtained at the Chief Engineer's Office, Town Hall, Jassy. Tenders to be delivered on or before Sept. 24.

Sept. 25. Beregszasz (Hungary).—*Erection and installation of electrical works for lighting the town and for industrial purposes:* deposit 10,000 kronen. Specifications and particulars may be obtained from Der Burgermeister der Stadt, Beregszasz. Tenders must be sent in not later than Sept. 25.

Sept. 25. Manchester.—*Erection of a steel parapet, &c., at Oxford Street bridge over the Rochdale Canal* Drawing may be seen and specification and form of tender obtained at the City Surveyor's office, Town Hall, Manchester, on payment to the city treasurer of £1 1s. All cheques or postal orders are to be made payable to the order of "The Corporation of Manchester." Tenders, enclosed in the official envelope, and addressed to the chairman of the Improvement, &c. Committee, to be delivered at the city surveyor's office not later than 10 a m. on Sept. 25.

Sept. 27. Pentre, Rhondda.—*Steel work of a road bridge of 19ft. span and 35ft. in width*, erected complete in Bailey Street, Ton Pentre, near Ystrad Station. Tenders must be received not later than Sept. 27. Forms of tender and plans may be obtained on application to W. J. Jones, engineer and surveyor, at the Council Offices, Pentre, Rhondda, on deposit of £1 1s.

Sept. 28. South Shields.—*Warming and ventilation, on the Plenum system*, of a block of four school departments, accommodating a total of 1,950 scholars, to be erected on the site of the Mowbray Council School, South Shields, subject to the approval of the plans for the same by the Board of Education and the Local Government Board. The plans may be inspected and further particulars will be supplied at the offices of Henry Grieves, A.R.I.B.A., architect, Albany Chambers, King Street, South Shields, to whom draft schemes and estimates must be delivered not later than Sept, 28.

Sept. 28. Pewsey.—*Sinking of a well, 10 ft. internal diameter and 90 ft. deep, and for sinking from the bottom of such well a bore hole 12 ins. internal diameter and a further 11 ft. deep*, together with other work in connection therewith at Pewsey for the R.D.C. The drawing and specification for the above may be seen of S. B. Dixon, clerk to the Pewsey R.D.C., Pewsey, from 10 a.m. to 5 p.m. each day except Saturdays. Copies of specification and form of tender and schedule may be obtained from Fairbank and Son, C.E., engineers, Lendal Chambers, York, on payment of £3 3s. Sealed tenders, endorsed "Tender for Well and Bore Hole, Contract A," must reach S. B. Dixon on or before 10 a.m. on Sept. 28 next.

Oct. 2. Bangor (Co. Down).—*Construction of a reservoir* and auxiliary works at Ballysallagh Major, near Bangor; also laying a line of 12-in. pipes from the intended reservoir to Bangor urban district boundary. Plans and specification of the intended works may be seen at the office of Messrs. L. L. Macassey & Sons, 7, Chichester Street, Belfast. Quantities for the intended works may be obtained from Mr. S. C. Hunter, Scottish Provident Buildings, Belfast, from whom also a copy of the specification may be had on a deposit of £5 5s., which will be repaid on the return of the same. Tenders, accompanied by priced bills of quantities and specification, to be lodged with James Milliken, town clerk, Bangor, Co. Down, not later than noon on Tuesday. Oct. 2.

Oct. 10. Brussels.—*Construction of a section of the railway from Hannut to Huccorgne on the local railways from Hannut to Vinalmont and Burdinne to Huy.* The estimated cost of the work is 287,500fr. (£11,500), and a deposit of 29,000fr. (£1,160) is required to qualify any tender. Tenders by registered letter will be received at the "Société nationale des chemins de fer vicinaux" offices, 14 Rue de la Science, Brussels, not later than Oct. 9. A copy of the specifications may be obtained on payment of 1fr. from M. Mahieu, Rue du Moulin, No. 3, Waremme.

Nov. 3. Shanghai.—*Construction and erection of two steel girder bridges across the Soochow Creek to replace the present Garden Bridge and Chekiang Road Bridge.* The Garden Bridge will consist of two spans, each of 171 feet and having a width of 60 feet between the parapets. The Chekiang Road Bridge will be one span of 196ft. with a width of 40ft. between parapets. General conditions, specifications, drawings, forms of tender, and all other information may be obtained at the office of Charles Mayne, M.Inst.C.E., municipal engineer, No. 15, Hankow Road. A charge of Tls. 100 will be made for the specification and set of drawings. Sealed tenders, separately for each bridge, and endorsed "Garden Bridge," or "Chekiang Road Bridge," will be received by W. E. Leveson, secretary, Council Room, Shanghai, not later than noon on Nov. 3.

Nov. 6. Madrid.—*Construction and working of a railway between Ferrol and Betanzos*, in accordance with conditions set forth in the "Gaceta de Madrid" of August 7. A Government subsidy of 3,054,508 pesetas (about £109,284), payable in eight annual instalments, will be granted to the concessionnaire. All materials imported for the construction of the line and for its working during the first 10 years will be exempted from import duties. A deposit of 145,259 pesetes (about £5,196) is required to qualify any tender. Tenders will be opened on Nov. 6 at the Directorate General of Public Works, Madrid.

IRON AND STEEL.

Sept. 19. Leigh-on-Sea.—*Supply and delivery of 22 tons or thereabouts of 4in. diam. and 3in. diam. cast-iron pipes and specials* for the U.D.C. Particulars may be obtained on application to J. W. Liversedge. C.E., surveyor to the Council. Tenders to be signed, sealed, and delivered to the Clerk to the Council, Carlyle Croasdell, not later Sept. 19.

No date. Wolverhampton. *130 yds. unclimbable iron fencing*, 6ft. high. H. Hill, Avenue Road, Wolverhampton.

PAINTING AND PLUMBING.

Sept. 14. Preston.—*Painting, &c.*, the fire station in Tithebarn Street. Specification may be seen, form of tender, and all particulars obtained at the office of the Borough Surveyor, Town Hall, Preston, to whom sealed tenders, endorsed "Tender for Painting, &c., Fire Station," must be delivered not later than 12 noon on Friday, Sept. 14.

Sept. 14. Bristol.—*Painting roofs, &c., of five hospital pavilions* at Eastville Workhouse in accordance with specification, which is deposited for inspection with J. J. Simpson, clerk to the Guardians, St. Peter's Hospital, Bristol. Tenders for the execution of the work must be in the prescribed form, and must reach him before 12 noon on Sept. 14.

Sept. 17. Shardlow.—*Painting and decorating* at Workhouse, Shardlow, in accordance with specification, which may be seen with J. W. Newbold, clerk to the Guardians, any week-day, except Saturday. between 9 and 5. Tenders, endorsed "Painting and Decorating," to be sent to Clerk, at the Board-room, Shardlow, not later than 9 a.m. on Sept. 17.

Sept. 17. Belfast.—*Outside cleaning and painting the porter store and stables, &c.*, in occupation of A. Guinness, Son, & Co., Ltd., at Grosvenor Street Goods Station, Belfast. Parties wishing to tender for the work can see the specification at the office of W. H Mills, engineer-in-chief, Amiens Street Terminus, Dublin, or copy of same at the office of the district engineer, Belfast, and form of tender can be obtained at either of the said offices on payment of 1s. each (not returnable). Tenders, made out on the forms supplied by the company, and endorsed "Tender for Painting," must be lodged with T. Morrison, secretary, secretary's office, Amiens Street Terminus, Dublin, not later than 10 a m. on Sept. 17.

Sept. 17. Thornton Heath.—*External Painting, &c., at the Union Offices, Mayday Road, Thornton Heath, Surrey*, for the Guardians of the Croydon Union. The specification, conditions of contract, and form of tender may be obtained at the office of H. Berney, architect, 104, George Street. Croydon, surveyor to the Guardians. upon depositing the sum of £2 2s. The contractor will be required to enter into a contract and bond and give two sureties to be approved by the Guardians for the due performance thereof. Tenders, sealed and marked "Tender for external painting at the Union Offices," are to be addressed to H. List, and delivered at the Union Offices, Mayday Road, Thornton Heath, Surrey, not later than 4 p.m. on Sept. 17.

Sept. 18. Hull. — *External painting* of the municipal technical school. Particulars and forms of tender can be obtained from J. T. Riley, secretary of education, Education Offices, Albion Street, Hull. Sealed tenders, duly endorsed, and addressed to the Secretary of education, must be delivered not later than 5 p.m. on Tuesday, Sept. 18.

Sept. 18. Chesterfield.—*Painting, papering, and colour washing* at the Children's Home, Ashgate Road, Chesterfield. Full particulars can be obtained from W. H. Wagstaff, architect and surveyor, 57, Saltergate, Chesterfield. Tenders must be sent to R. F. Hartwright, clerk to the Guardians, Union Offices, Chesterfield, on or before Sept. 18.

Sept. 18. Lancaster. *Painting outside of property in Ullswater Road, Prospect Street, and Green Street*, for the Lancaster and Skerton Equitable Industrial Co-operative Society, Ltd. Specification and conditions may be had on application at the Office of the Society, and sealed tenders must be sent in not later than 6 p.m. on Sept. 18, to A. Varley, secretary.

Sept. 19. Bootle.—*Painting* the railings, gates, &c., at the North Recreation Ground and Morton Gardens. Specification may be seen and forms of tender obtained at the office of the Borough Engineer. Tenders, sealed and endorsed "Painting, (1) North Recreation Ground, (2) Morton Garden," must be sent to J. Henry Farmer, town clerk, Town Hall, Bootle, not later than 10 a.m. on Sept. 19.

Sept. 19. London, E.—*Staining and polishing the floors of the day rooms and dormitories at the* new schools at Hutton, Essex, for the Guardians of the Poplar Union, comprising a superficial area of between five and six thousand square yards. Quotations, at per square yard, should be sent in not later than 6.30 p.m. on Sept. 19 to G. H. Lough, clerk to the Guardians, Union Offices, 45, Upper North Street, Poplar, E.

Sept. 26. Hull. — *Painting, &c.*, at the new central police station, Alfred Gelder and Parliament Streets. Forms of tender and other particulars may be obtained from Joseph H. Hirst, city architect, Town Hall, Hull. Tenders, endorsed "Tender for Cleansing and Painting New Central Police Station," are to be addressed to the Chairman of the Station House Sub-Committee, and delivered at the Town Clerk's Office, Hull, before 10 a.m. on Wednesday, Sept. 26.

No Date. Castleford.—*Painting, &c.*, at the Castleford Market Hall, in accordance with the quantities and specification prepared by Mr. W. Green, surveyor to the U.D.C., copies of which may be obtained on a deposit of £1 1s, which will be returned on receipt of a *bona-fide* tender.

ROADS AND CARTAGE.

Sept. 13. Romney Marsh.—*Steam rolling.* Hire of two 10-ton steam rollers, including fuel, water-cart, and necessary attendants for rolling about 4,000 yards of material, commencing Oct. 15. Tenders endorsed "Steam Rolling" to be delivered to William B. Smith, District Surveyor, New Romney, not later than Sept. 13.

Sept. 15. Chesham.—*Completion of certain private street works (including metalling, paving, and relaying, kerbing, and channelling) in Stanley Avenue*, situate within the U.D. of Chesham. Plans, sections, and specification may be seen upon application to P. C. Dormer, surveyor and waterworks engineer, Council Offices, Chesham. The firm whose tender is accepted will be required to enter into a contract and bond with two approved sureties for the due performance of the contract. A copy of such contract and bond may be seen during office hours at the office of J. G. How, clerk to the Council, High Street, Chesham. Tenders, sealed and endorséd "Stanley Avenue," to be delivered to P. C. Dormer on or before Sept. 15, at 10 a m.

Sept. 15. Hale.—*Supply of granite macadam' limestone, kerbs, channels, stoneware, and earthenware pipes, cinders and other ballast, ironmongery' brushes, and other tools, oils, cement, disinfectants, tar*, &c., for a period of 12 months, commencing Oct. 1, 1906, for the Hale U.D.C. Forms of tenders and further particulars may be obtained of F. E. Boaz, surveyor, Council Offices, Hale, Cheshire, between the hours of 9 a.m. and 5 p.m., to whom all enquiries should be addressed. Tenders to be forwarded not later than Sept. 15 to J. G. Whyatt, clerk to the Council

Sept. 17. Westhampnett.—*Cartage* of flints and gravel from the roadside depots. Quantities, situation of depots, conditions, and dates of cartage, &c., may be obtained of the Council's surveyors, Mr, J. J. Budden, of 4, St. Pancras, Chichester, and Mr J. H. Hobgen, of 43, Lyndhurst Road, Chichester. Forms of tender, endorsed "Tender for Cartage," must be delivered to William Duke Rasell, acting-clerk to the R.D.C., 5, South Street, Chichester, on or before Sept. 17.

Sept.18. Spennymoor.—*Supplying and laying new concrete flags and kerbing* for a portion of High Street, Spennymoor, for the U.D.C. Plans and specifications may be seen, and forms of tender obtained, on application to Mr. C. R. Spencer, surveyor to the Council, Silver Street. Spennymoor. Tenders, marked "High Street Footpath," to be sent to F. Badcock, clerk, Council Offices, Spennymoor, not later than Tuesday, Sept. 18.

Sept. 24. Witham.—*Use of Steam Roller and Scarifier*, to include driver, flagman and coal, at such times and places as the surveyor, Mr. W. P. Perkins, Witham, may direct. Tenders, endorsed "Tender for Steam Roller," to be sent by Monday, Sept. 24, to Wm. Bindon Blood, clerk to the U.D.C., Witham, Essex.

Sept. 24. Otley.—*Sewering, paving and making good of Back Garnett Street* for the U.D.C. Drawings and specification may be seen at the offices of J. E. Sharpe, engineer and surveyor, Council Offices, Otley, where quantities may also be obtained on depositing cheque for £1 1s. Sealed and endorsed tenders must be delivered at the office of J. E. Sharpe not later than 2 p.m. Sept. 24.

No date. Blandford.—*Steam rolling* for one year. For specifications and forms of tender apply to Edward Phelps, district surveyor, Blandford, Dorset. Tenders, endorsed "Tender for Steam Rolling," to be sent to Sinclair Triall, clerk to the Council, Blandford, Dorset.

SANITARY.

Sept. 13. Plympton St. Mary.—*Excavating and laying* about 300ft. of 6-in. stoneware pipe sewer and building manholes, in the village of Brixton, for the R.D.C. Plans and specifications may be seen at the office of John W. Bickle, solicitor, Temple Chambers, Westwell Street, Plymouth, to whom sealed tenders must be sent, endorsed "Brixton Drainage," not later than Thursday, Sept. 13. Further particulars may be obtained on application to Mr. W. E. Horton, sanitary inspector, Plympton.

Sept. 17. Seaford.—*Construction of about 1,300yds. of 9-in. pipe sewer*. with manholes and other incidental works in Firle Road and Blatchington Street, for the U.D.C. Plan and specification may be seen and bills of quantities obtained at the office of the Engineers, Messrs. Pollard and Tingle, MM.I.C.E., 31, Old Queen Street, Westminster. Sealed tenders, endorsed "Firle Road Drainage," to be sent to W. H. Pawson, clerk, Council Offices, 3, Clinton Place, Seaford, Sussex, not later than 4 p.m. on Monday, Sept. 17.

Sept. 17. London, W.—*Re-drainage and sanitary work at the Nurses' Home, St. Marylebone Infirmary*, Rackham Street, Notting Hill, W. Persons desiring to tender may inspect the specification and drawing, and obtain bills of quantities and form of tender, between the hours of 10 a.m. and 4 p.m. (Saturday 10 a.m. to 1 p.m.), upon application to the Guardians' architect, A. Saxon Snell, F.R.I.B.A., of 22, Southampton Buildings, Chancery Lane, W.C., and depositing with him a £10 Bank of England note. Tenders to be signed, sealed, and endorsed "Tender for Re-drainage and Sanitary Work at the Nurses' Home," and addressed and delivered to H. T. Dudman, clerk to the Guardians, Guardians' Offices, Northumberland Street, Marylebone Road, W., at or before 10.30 a.m. on Sept. 17.

Sept. 18. Blaina.—*Re-construction of the drainage and the erection of a lavatory at Blaina Central School.* Plans and specifications may be seen at the office of R. L. Roberts, M.S.A., Abercarn. Quantities supplied. Sealed tenders, endorsed "Tender for Drainage, &c., Blaina Central School," are to be delivered to C. Dauncey, clerk of the Group, County Council Offices, Newport. not later than Sept. 18.

Sept. 19. Wigan.—*Cleansing of privies, ashpits and cesspools* (all farm premises excepted) in Parbold, Shevington, Haigh. Worthington and Wrightington, divided inio the following sections :—Section No. 1, the whole of Parbold; Section No. 2, the west portion Wrightington, from the road leading from Dangerous Corner, Courage Lane and Toogood Lane; Section No. 3, the east portion of the said road, including Mr. Watson's house; Section No. 4, the portion lying to the south of Wrightington Hall Lane; Section No. 5, the south-west portion of Shevington, including Back Lane, Miles Lane, Broad-o'th'-Lane, Church Lane, and Gathurst Lane; Section No. 6, the north-east portion, including Shevington Moor, Almond Brook, Barracks, and Foxfield; Section No. 7, the village of Crooke; Section No. 8, the east side of the canal of the township of Haigh; Section No. 9, the west side of the canal of the township of Haigh; Section No. 10, the whole of the township of Worthington. Tenders must be for the term of one year, from the 1st October, 1906, except Section No. 6, which is for a term of one year from the 1st November, 1906, and may be for one or more sections, and must be sent in not later than Sept. 19, endorsed "Scavenging," to the Clerk to the Council, H. Ackerley, 9, Victoria Buildings, King Street, Wigan.

MISCELLANEOUS.

Sept. 22. Manchester.—*Supply of terra cotta* for the Oswald Road Municipal School, Chorlton-cum-Hardy, Manchester. Plans may be seen and a copy of the bill of quantlties (including specification) may be obtained at the offices in Deansgate, Manchester, on a deposit of £1 1s. Cheques to be made payable to the Accountant, Education Offices, Deansgate, Manchester. Tenders, on the forms and in the envelopes provided, must be delivered at the Deansgate Offices of the Education Committee not later than Sept. 22.

Sept. 29. Gosport and Alverstoke.—*Supply of the following materials*, &c., for the year ending Sept. 29, for the Gosport and Alverstone U.D.C. Broken stone for macadamising; kerb, channel and sets; artificial paving stone; stoneware draining pipes; cement and lime; castings; ironmongery. Specifications, forms of tender, &c., may be obtained from the Surveyor to the Council, H, Frost, Town Hall, Gosport, Tenders, sealed and endorsed "Tender for ——," as the case may be, should be delivered, with any necessary samples, at the offices of the Council not later than 12 o'clock noon on Sept. 13. Fair wages clause.

TOO LATE FOR CLASSIFICATION.

Sept. 15. Vienna (Austria). *Construction of a section of the railway from Trient to Malo*, Specification and particulars may be had on application to Eisenbahnbaudirektion, VI., Gumpendorferstrasse 10, Vienna. Tenders must be sent in by Sept. 15.

Sept. 15. Tweedmouth.—*Additions to the Tweedside Industrial Co-operative Society's premises, Tweedmouth.* Plans and specifications may be seen on application to W. Gray & Nephew, Architects, 2, Ivy Place, Berwick-on-Tweed, and tenders to be delivered to them by 6 p.m. on Sept. 15.

Sept. 15. Coventry.—*Painting and decorating the interior of the public baths*, Priory Street, for the Baths and Parks Committee of the Corporation. Specification and form of tender may be obtained on application at the office of J. E. Swindlehurst, city engineer and surveyor, St. Mary's Hall, Coventry. Sealed tenders, endorsed "Painting Public Baths," to be delivered at the office of the City Engineer not later than Sept. 15.

Sept. 17. Newcastle-on-Tyne.—*Construction of an underground public convenience in the Haymarket.* On payment, by contractors, of £2 2s to the City Treasurer, specifications, conditions, bills of quantities, and form of tender can be obtained, and drawings inspected, at the City Engineer's Office, Town Hall, Newcastle. Tenders, addressed to the "Sanitary Committee, Committee Clerk's Office, Town Hall, Newcastle-upon-Tyne," to be sent in before noon on Sept. 17.

Sept. 17. Houghton-le-Spring.—*Laying about 370 square yards of concrete flagging in Newbottle Street* for the U.D.C. Specification may be seen at the office of J. W. Holbrook, surveyor, 14a, Church Street, Houghton-le Spring, between 12 and 1 p.m and 4 and 5 p.m. Tenders to reach D. Miller, clerk of the Council, Houghton-le-Spring, before noon on Sept. 17.

Sept. 18. Rochester.—*Supply of Portland cement, curbs and paving materials*, for the 12 months ending Sept. 29, 1907. Specification and form of tender can be obtained on application to W. Banks, A.M.I.C.E., city surveyor, Guildhall, Rochester. Sealed tenders, endorsed "Tender for ——," are to be delivered to A. Kennette, town clerk, Guildhall, Rochester, before 4 o'clock on Sept. 18.

Sept. 21. Celbridge.—*Internal colouring and painting of several wards and passages in the Workhouse Infirmary* for the Celbridge Union, in accordance with a specification prepared by J. J. Inglis, Esq., C E., a copy of which can be seen of F. Shortt, clerk of the Union, Board-room, or at the office of the engineer, at 18, Nassau Street, Dublin. Contractors must submit the names of two solvent sureties willing to join in a bond for the due fulfilment of the contract. Sealed tenders, marked "Tender for Painting, &c.," will be received by the clerk at the Board-room up to, but not after, 11 o'clock on Sept. 21.

New Companies.

Abdon Clee Stone Quarry Co. Capital: £15,000.

Hoo Brick Co., High Street, Rochester. Capital: £6,000.

Chick, Carden & Co., builders, contractors, &c. Capital: £10,000.

Jena Glass Co., 15, South Street, Finsbury Pavement, E.C.—Capital: £1,000.

Coming Events.

Saturday, Sept. 15.
Northern Architectural Association.—Visit to the churches of St. Gabriel and St. Mark, and the tramcar sheds, Newcastle.

Saturday, Sept. 15.
Architectural Association.—Week End visit to Chichester.

Wednesday, Sept. 19.
Institute of Sanitary Engineers.—Opening Sessional Meeting, Holborn Restaurant, at 7.30 p.m.

Saturday, Sept. 22.
Institute of Sanitary Engineers.—Visit to Hampton Sewage Works.

Saturday, Sept. 29.
Northern Architectural Association.—Students' Sketching Club Excursion.

Friday, Oct. 5.
Architectural Association.—Annual General Meeting. President's Address (R. S. Balfour) and Distribution of Prizes.

Current Market Prices.

FORAGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	14	0	1	16	0
Clover, best...	per load	4	4	0	4	15	0
Hay, good	do.	3	17	6	4	2	6
Sainfoin mixture	do.	4	0	0	4	7	6
Straw...	do.	1	8	0	1	14	0

MISCELLANEOUS.

		£	s.	d.	
Bricks Stocks, d/d to job	per 1,000	1	15	0	—
Do. Flettons on rail ...	do.	1	5	0	—
Do. Pressed Wire Cuts, d/d to job ...	do.	1	17	0	—
Do. Blue brindled wire cuts	do.	1	2	0	—
Do. do. wire cuts ...	do.	1	6	0	—
Do. do. pressed facings	do.	1	17	6	—
Coke Breeze, into carts at gasworks ...	per load	0	2	0	—
Do. d/d to job	do.	0	4	0	—
Sand	per yard	0	7	6	—
Ballast	do.	0	6	6	—
Granite Chippings ...	do.	0	10	6	—
Do. do. ¼in. ...	do.	0	11	6	—
Do. Broken, 1½in. ...	do.	0	15	6	—
Do. do. 2in. ...	do.	0	15	0	—
Do. do. 2½in ...	do.	0	14	6	—
Do. Kerb, Norwegian 6×12 and 12×6 in river	per foot	0	1	2	—
Do. do. do. circular	do.	0	1	5	—
Do. do. do. 12×8 in river	do.	0	1	5	—
Do. do. do. circular	do.	0	1	8	—
Do. do. Guernsey 6×12 in river	do.	0	1	4	—
Do. do. do. circular	do.	0	1	6	—
Do. do. do. 12×6 do.	do.	0	1	6	—
Do. do. do. do.	do.	0	1	8	—
Do. do. do. 18×8 do.	do.	0	1	8	—
Do. do. do. do.	do.	0	1	10	—
Do. Pitchings, Norwegian, 3×6	per ton	1	8	0	—
Do. do. do. 3×7	do.	1	10	0	—
Do. do. do. 3×5	do.	1	9	0	—
Do. do. do. 4×5	do.	1	8	0	—
Do. do do. 4×4	do.	1	13	0	—
Do. do. do. 4×6	do.	1	5	0	—
Do. do. do. 5×6	do.	1	4	0	—
Do, do. do. 5×7	do.	1	4	0	—
Do. do. do. Special, 4×6	do.	1	11	0	—
Do. do. do. do. 5×7	do.	1	18	0	—
Do. do. Guernsey, 3×6	do.	1	10	0	—
Do. do. do. 3×7 & 3×9	do.	1	8	6	—
Do. do. do. 3×5	do.	1	10	0	—
Do. do. do. 4×5	do.	1	10	0	—
Granite, Pitchings, Guernsey, 4×4	do.	1	13	0	—
Do. do. do. 4×6	do.	1	9	0	—
Do. do. do. 4×7	do.	1	6	6	—
Do. do. do. 5×6	do.	1	6	0	—
Do. do. do. 5×7	do.	1	5	0	—
Do. do. Specials add.	do.	0	6	0	—
Glass, English Sheet, in crates of stock sizes, 15oz., 2nds	per sq. ft.	0	0	3½	—
Do. do. do. do. 3rds.	do.	0	0	2½	—
Do. do. do. 21 oz. 2nds	do.	0	0	5	—
Do. do. do. do. 3rds	do.	0	0	3½	—
Do. do. do. 26 oz. 2nds	do.	0	0	6	—
Do. do. do. do. 3rds	do.	0	0	4½	—
Do. do. do. 32 oz. 2nds	do.	0	0	8	—
Do. do. do. do. 3rds	do.	0	0	6	—
Do. English patent plain rolled plate in stock crates ⅛	do.	0	0	2	—
Do. do. do. 3/16	do.	0	0	2¼	—
Do. do. do. ¼	do.	0	0	2½	—
Do. Atter (Abo.) do. & White, Inf. 5th, 3×8	do.	8	10	0	—
Do. do. (do.) Yellow, unsorted, 3×9	do.	9	10	0	—
Do. Constantza, White, 3rd, 3×11	do.	9	10	0	—
Cement	per ton	1	12	0	—
Lime	do.	1	4	0	
Castor Oil, French ...	per cwt.	1	10	0	1 2 0
Colza Oil, English ...	do.	1	8	6	—
Copperas	per ton	2	0	0	—
Lard Oil	per cwt.	2	15	0	2 17 0

		£	s.	d.	£	s.	d.
Lead, white, ground, carbonate	per ton	16	0	0		—	
Do. red	do.	15	0	0	19	0	0
Linseed Oil, barrels ...	per cwt.	0	19	0		—	
Petroleum, American ...	per gal.	0	0	$6\frac{3}{8}$	0	0	$6\frac{1}{2}$
Do. Russian ...	do.	0	0	6	0	0	$6\frac{1}{8}$
Pitch	per barrel	0	9	0		—	
Shellac, orange	per cwt.	11	0	0		—	
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Town	per cwt.	1	11	0	1	11	6
Tar, Stockholm	per barrel	1	5	0		—	
Turpentine	per cwt.	2	7	0		—	

METALS.

		£	s.	d.	£	s.	d.
Standard Copper	per ton	86	0	0	86	5	0
Do. Strong sheets ...	do.	98	10	0	99	0	0
Lead, soft foreign	do.	17	10	0	18	0	0
Do. English	do.	18	5	0	18	10	0
Do. pipes...	do.	20	15	0	21	0	0
Do. sheets	do.	20	5	0	20	10	0
Galvanised Corrugated sheets	per ton	12	10	0	12	12	6
Spelter G.M.	do.	27	5	0	27	10	0
Angles, Scotland	do.	6	15	0	7	0	0
Bars, do.	do.	7	15	0	8	0	0
Marked bars, Staffs. ...	do.	8	10	0	8	12	6
Common bars, do. ...	do.	6	5	0	6	10	0
Angles, M'boro.	do.	6	7	6	6	10	0
Joists. M'boro	per ton	6	5	0	6	7	6
Angles, Midlands	do.	6	12	6	6	15	0
Joists do.	do.	6	17	6	7	0	0
Girder plates, Midlands ...	do.	7	7	6	7	10	0
Angles, Foreign, c.i.f. Thames	do.	6	7	6	6	10	0
Tees do. do. do.	do.	6	10	0	6	12	6
Joists, do. do. do.	do.	6	2	6	6	4	0
Channels do. do. do.	do.	6	7	6	6	8	6
Plates do. do. do.	do.	6	17	6	7	2	6
Tin, Foreign	do.	185	0	0	186	0	0
Do. English ingots ...	do.	184	0	0	185	0	0
Zinc, sheets, Silesian ...	do.	27	0	0	27	10	0

TIMBER.

		£	s.	d.	£	s.	d.
Deals, Archangel, Yellow 3rd, 3×9	per std.	11	5	0		—	
Do. do. do. do. $2\frac{1}{2}$×9	do.	12	5	0		—	
Do. Soroka, Yellow, 1st, 3×7	do.	14	0	0		—	
Do. do. do. 2nd, 3×9	do.	14	0	0		—	
Do. Skelleftea, Yellow, 5th, 3×9	do.	9	10	0		—	
Do. St. Petersburg, Yellow, 1st & 2nd, $2\frac{1}{2}$×7	do.	8	15	0		—	
Do. Wartsala, Yellow, 1st & 2nd, $2\frac{1}{2}$×7	do.	10	10	0		—	
Do. Helsingfors, Yellow, unsorted, $2\frac{1}{2}$×7	do.	10	0	0		—	
Battens, Christiania, White, unsorted, 2×4	per std.	8	10	0		—	
Do. Constantja, White, 3rd, 1×11	do.	7	10	0		—	
Do. Cefle, Yellow, 1st & 2nd, 2×$4\frac{1}{2}$	do.	9	10	0		—	
Do. do. White, unsorted, $1\frac{1}{4}$×9	do.	10	15	0		—	
Do. Norrsundet (Gefle) Yellow, dry, 1st & 2nd, $1\frac{1}{2}$×9	do.	9	10	0		—	
Do. Fredriksstad, White, unsorted, 2×4	do.	8	10	0		—	
Do. do. do. do. 1×10	do.	9	0	0		—	
Do. Kaunissaari, Yellow, unsorted, 2×3	do.	9	0	0		—	
Do. Raumo, Yellow, 1st & 2nd, 2×4	do.	8	0	0		—	
Do. St. Petersburg, Yellow, 3rd, 2×7	do.	9	0	0		—	
Do. do. do. do. 2×6	do.	9	0	0		—	
Do. do. do. do. 2×5	do.	9	0	0		—	
Do. do. do. do. 2×4	do.	9	15	0		—	
Do. do. do. do. $1\frac{1}{2}$×6	do.	8	10	0		—	
Do. do. do. do. 1×5	do.	8	10	0		—	
Do. do. White, 3rd, $2\frac{1}{2}$×$6\frac{1}{2}$	do.	8	5	0		—	
Do. do. do. do. 2×5	do.	7	10	0		—	
Do. do. do. do. 2×4	do.	8	15	0		—	
Do. do. do. do. 1×6	do.	8	10	0		—	
Do. Sóderhamn, White Inf. 5th, 2×7	do.	8	10	0		—	
Do. Skutskar, Yellow, 1st & 2nd, 2×$4\frac{1}{2}$	do.	9	0	0		—	
Do. Sando, White, 1st & 2nd, 2×4	do.	9	0	0		—	
Do. Wartsala, Yellow, 1st & 2nd. $2\frac{1}{2}$×6	do.	9	0	0		—	
Do. do. do. do. 2×7	do.	9	15	0		—	
Do. do. do. do. 2×$4\frac{1}{2}$	do.	9	5	0		—	
Do. do do. do. 2×4	do.	10	0	0		—	
Do. do. White, do. 2×4	do.	9	0	0		—	
Flooring Boards, Fredriksstad Yellow, 3rd $1\frac{1}{2}$×7	do.	0	12	6		—	
Do. do. do. do. $1\frac{1}{4}$×7	do.	0	12	6		—	
Do. do. do. do. $1\frac{1}{4}$×7	do.	0	12	0		—	
Do. do. do. do. 1×7	do.	0	10	0		—	
Do. do. do. unsorted, 1×6	do.	0	10	0		—	
Do. Mon, Yellow, 2nd, 1×6	do.	0	11	0		—	
Do. do. do. do. $1\frac{1}{4}$×6	do.	0	13	6		—	
Do. do. do. 3rd, $1\frac{1}{4}$×6	do.	0	12	3		—	
Do. Skonvik, Yellow, 1st, 1×6	do.	0	11	3		—	
Do. do. do. $1\frac{1}{4}$×6	do.	0	13	6		—	

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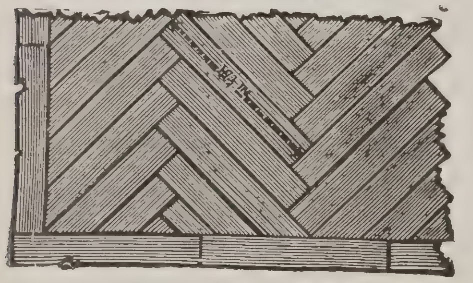

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$17\frac{1}{4}$ × 3 × 2	8 3	7 9	
$17\frac{1}{4}$ × 3 × $1\frac{1}{2}$	6 9	6 3	

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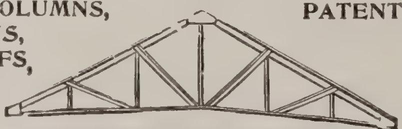

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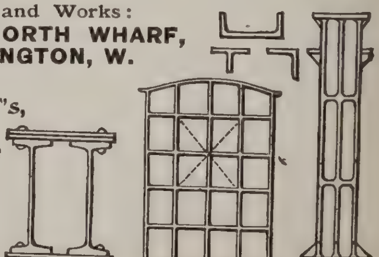

DELIVERIES FROM TOWN STOCK

THE BUILDERS' JOURNAL
AND ARCHITECTURAL ENGINEER.
September 12, 1906.
CONCRETE AND STEEL SUPPLEMENT (MONTHLY).

REINFORCED CONCRETE SEWERS, CONDUITS, &c., BUILT *IN SITU*.

By Frederick Purton.

The upkeep and renewal of sewerage works that have been constructed in brick are a continual source of expense to the ratepayers of the country. The failure of such works is being constantly recorded; and, to take only one out of several recent cases, the Borough Council of one of the suburbs of London have hardly completed one costly reconstruction scheme when they find it imperative to call upon the ratepayers to provide another large sum of money for similar works to make good a breakdown in another portion of their district.

The question therefore arises:

Is there not some form of construction other than brick that will prove more reliable and efficient and that can be carried out at the same or even less cost?

That concrete can be advantageously used as a building material has been recognised for many centuries, and it has been found to have been used in many an ancient Roman structure; but from the earliest days it was realised that its economic use was limited to purposes where it was subject to compression stresses only, and it has only been through the invention and progressive genius of the engineer of the last generation or so that methods have been discovered by which to add to concrete the tensile strength that it lacks.

This tensile strength

has been given by embedding iron and steel in the concrete to take up those stresses which concrete by itself is not able to withstand.

"Reinforced concrete," as this combination of the two materials is generally called, has a practically unlimited field of usefulness. But while it is being used on all sides for fire-resisting and other structural purposes, its merits and usefulness in the construction of sewers, conduits, &c. (at least in this country), have so far received little attention. Many such works have been carried out in reinforced concrete construction on the Continent and in America, but only a few in this country; and the following general particulars may be of use to those who have such work in contemplation.

The Limit of Size.

Generally speaking, it is impracticable to cast and transport to any distance or handle pipes of a greater internal dimension one way than 4ft., although works have been carried out in which pipes of considerably larger dimension have been successfully cast and laid in position. It may therefore be accepted as a general axiom that it is more economical to construct pipes of 4ft. and upwards *in situ* on suitable temporary centering. Undoubtedly this form of construction is the more common and the more adaptable of the two; for not only is the difficulty of the joint eliminated, but depressions, bends, branches, &c., can be more easily provided for. In many instances also the material necessary to form the aggregate for concrete may be found in the locality, and in such cases the elimination of a large part of the cost of transportation is an added feature in favour of the work constructed *in situ*.

With work constructed *in situ* the questions of the form of centering, the cement, the aggregate, the reinforcement, the inside finish to the pipe and the carrying out of the work must all be carefully considered both from the engineer's and contractor's point of view, for the success of the work is just as important to the one as its cost is to the other.

Centering.

For works of small or medium value timber centering is generally used, but for large and expensive works sheet-iron or metal-sheathed timber moulds give better results, especially if it be intended that the face left on the concrete from the centering shall form the finished or wearing surface. The metal centering does not suck the moisture out of the concrete and, as there are fewer joints, a closer-grained and more impervious finish is obtained than is possible with wood. Wood is, moreover, less durable and requires more attention, and after it has been used a few times the cement adheres to its surface, so that when the wooden centering is struck the face work is likely to be pulled away in patches.

The vibrations and shocks to which the centering will be liable should not be lost sight of, nor the alternate soaking and drying action to which it will be subjected, and tests should be made before the commencement of work to see that the forms are strong enough for their intended purpose, and also that they can be removed without "jarring" the "green" concrete.

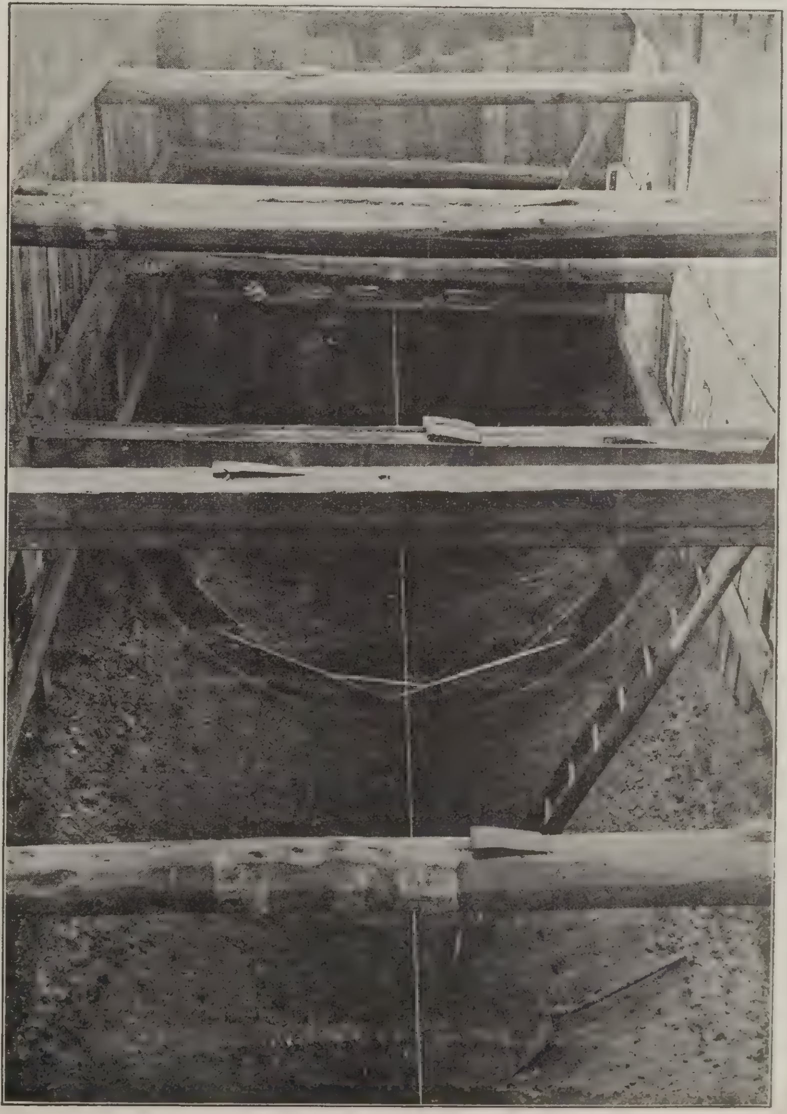

FIG. 1.—EXAMPLE OF EXCAVATION.

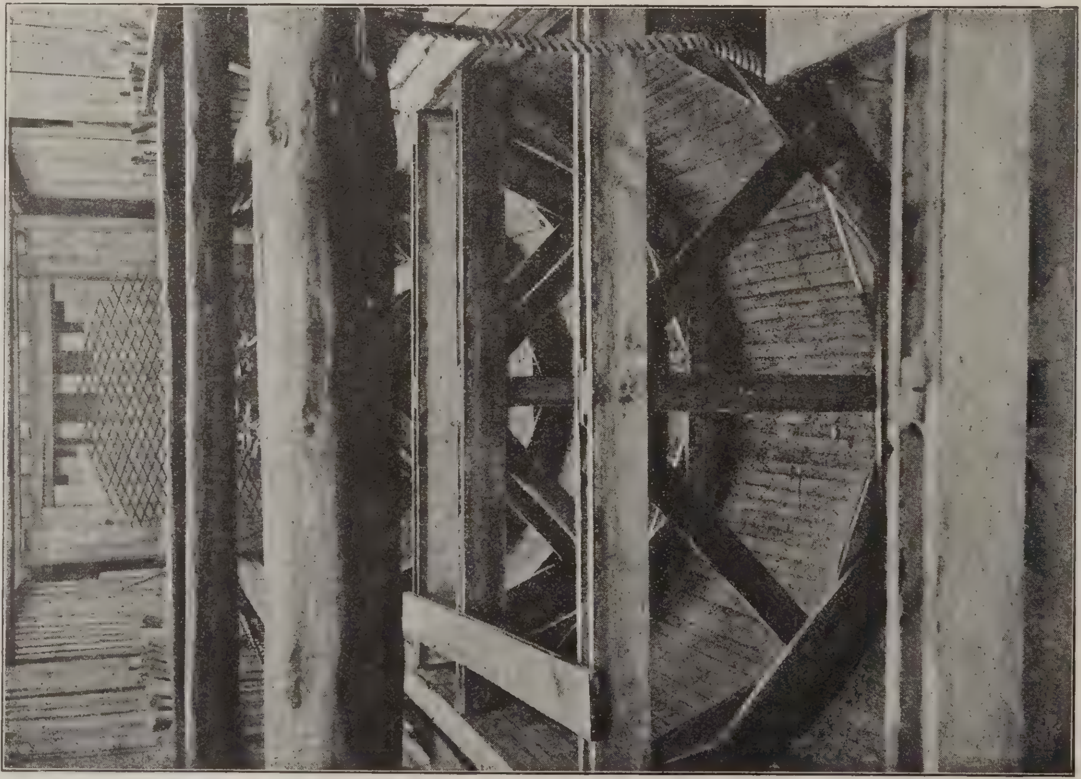

FIG. 2. EXAMPLE OF TIMBERING FOR INVERT.

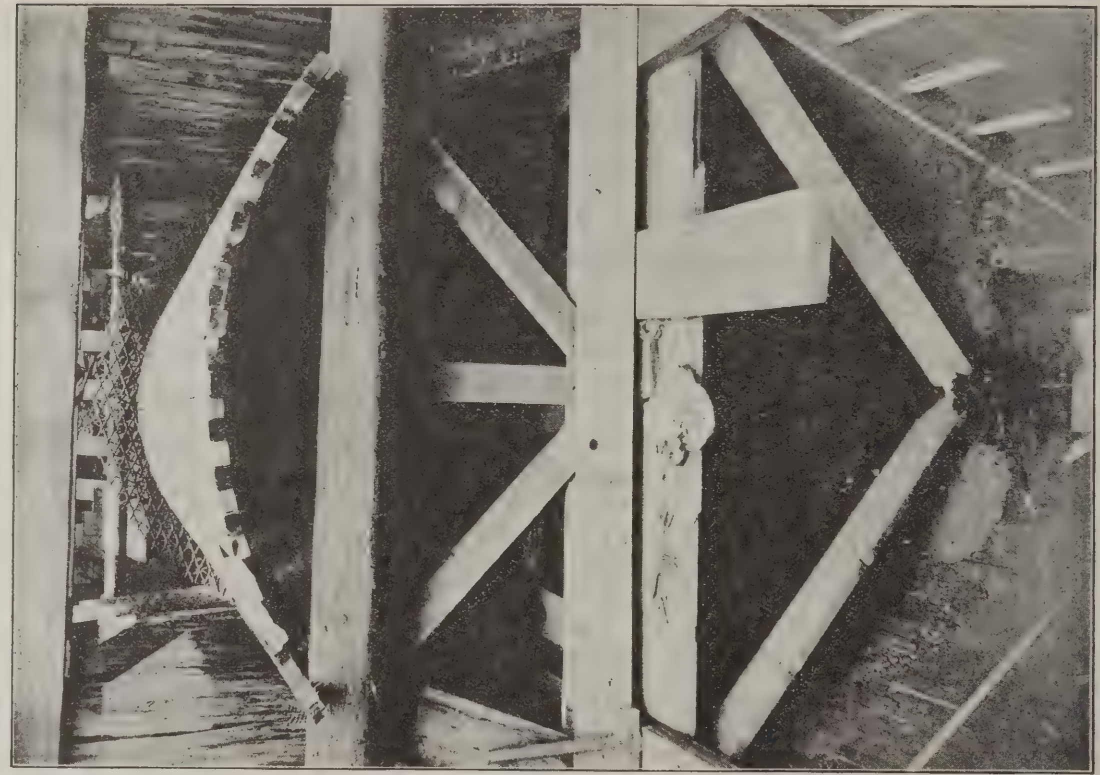

FIG. 3. EXAMPLE OF TIMBERING FOR CROWN.

Cement to Use.

The employment of good and suitable Portland cement is of the utmost importance. It should be finely ground and slow setting, and thoroughly cooled or air-slaked before use. The finer the cement the greater will be its value, while slow-setting cement—that which has its final set in seven or eight hours—is practically essential for use in reinforced concrete to allow of the separate deposits becoming thoroughly united. As special cements are now being manufactured for this class of work such brands should be chosen wherever possible.

Aggregate.

The aggregate must be carefully chosen. A hard natural aggregate should always be selected, and a porous one should never be used. As suggested above, a suitable aggregate may sometimes be found in the locality of the work, but cheapness is by no means the chief essential. A soft aggregate means a weak concrete, while a porous substance means a leaky job, and therefore a hard, impervious material is of vital necessity. It must be perfectly clean, its stones of an irregular nature and of a size not larger than will pass a 1-in. diameter ring; it should be free from all earthy matter, and if necessary it should be washed before use. The concrete must be made with the necessary proportion of clean sharp sand to prevent voids forming when the mixture is laid and tamped into position.

The Form of Reinforcement.

It is an open question which is the best form of reinforcement to use. There are many systems in vogue in various parts of the world, and examples could no doubt be quoted in which each has been successfully adopted, but a little consideration will settle the chief points to be decided.

The forms of reinforcement may practically be summed up under three heads—viz., a permanent sheet centering, rolled sections or rods in one form or another, and meshwork of various descriptions.

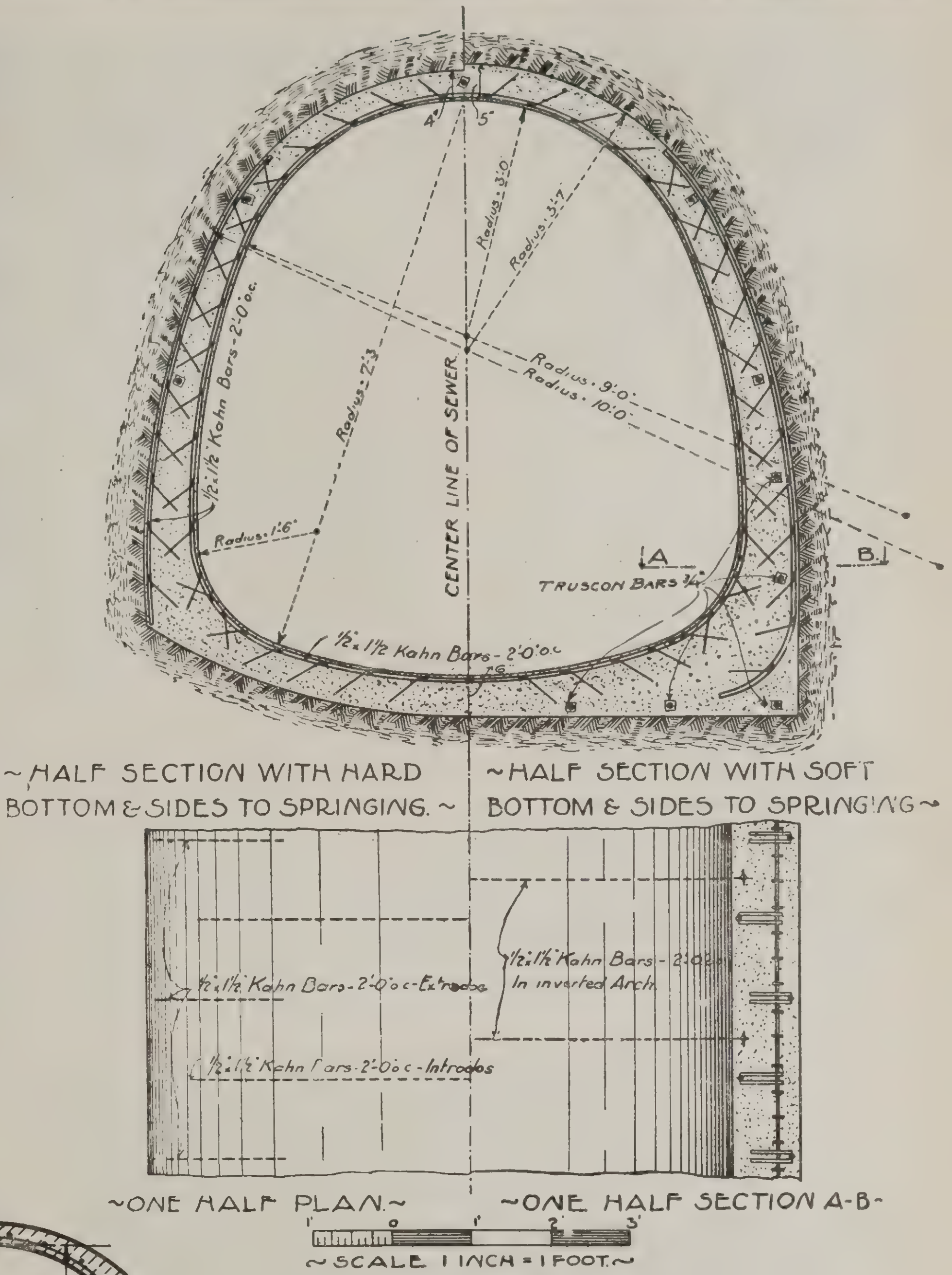
4'
5'
Radius: 3'0"
Radius: 3'7"
½ x 1½ Kahn Bars - 2'0" o.c.
Radius: 2'3"
CENTER LINE OF SEWER
Radius: 9'0"
Radius: 10'0"
Radius: 1'6"
A
B
TRUSCON BARS ¾"
½ x 1½ Kahn Bars - 2'0" o.c.
~HALF SECTION WITH HARD BOTTOM & SIDES TO SPRINGING.~
~HALF SECTION WITH SOFT BOTTOM & SIDES TO SPRINGING~
½ x 1½ Kahn Bars - 2'0" o.c. - Extrados
½ x 1½ Kahn Bars - 2'0" In inverted Arch
½ x 1½ Kahn Bars - 2'0" o.c. - Intrados
~ONE HALF PLAN.~
~ONE HALF SECTION A-B-
1' 0 1' 2' 3'
~SCALE 1 INCH = 1 FOOT.~

FIG. 6. KAHN BAR REINFORCEMENT.

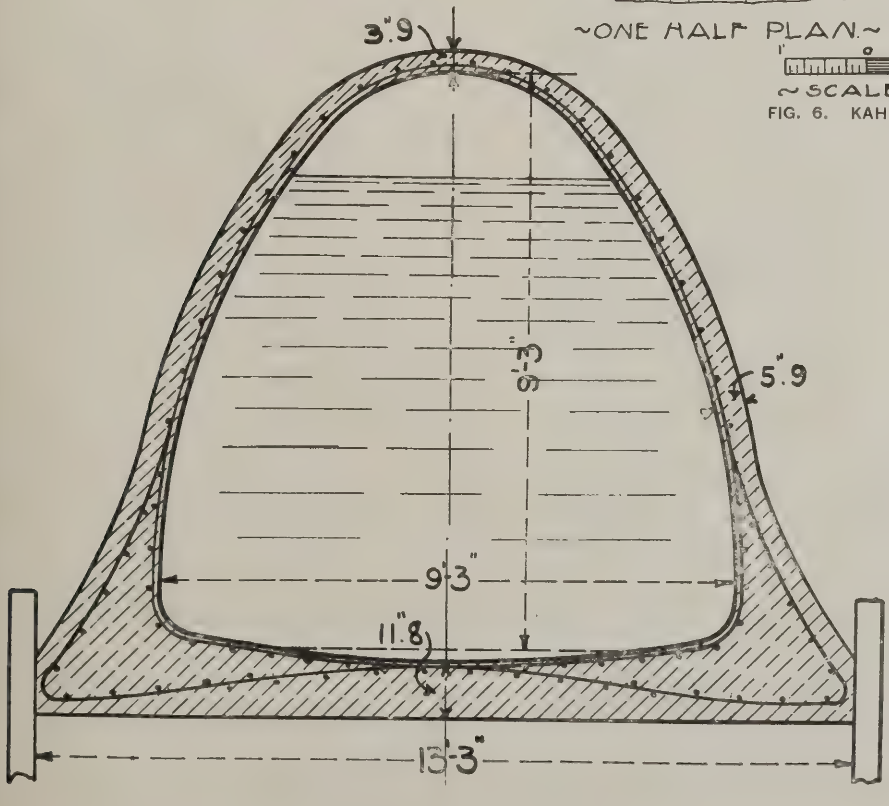

FIG. 4.—ROUND ROD REINFORCEMENT.

Now, it is obvious that a solid sheet of metal to act at the same time as a permanent centering and a lining to receive an inside finish is bad construction. There is no bond between the metal and the covering, and in the event of any settlement or temporary deformity the concrete and facing would burst away from the metal lining. The metal might not give way with the concrete, but without the protective coats the life of the pipe would be limited according to the amount of salts or acids in the water inside and in the surrounding material.

With regard to rolled sections and rods, longitudinal or circumferential reinforcement alone is insufficient. A combination of the two is necessary.

If meshwork be used, it should be diamond shaped and laid so that the diagonals of the mesh run over with, and the other at right angles to, the periphery of the pipe, in which way a reinforcement of helical members crossing each other is obtained.

Imperviousness to Water.

As it is of the first importance that sewers, conduits, &c., should be impervious to water in all cases, and sometimes that they should resist a considerable pressure, the inside finish or facing coat of the pipe must receive most careful attention. The concrete forming the main shell should not be depended upon for impermeability, for experience has shown that the tamping seams are to be feared, no matter how carefully fresh material may be added to that which has already been laid. Some experts assert that cement-concrete can be made watertight by the addition of a small percentage of lime, and others that trass is the material of the future for this purpose. Soap and alum, in proper proportions, added to the water to be used for mixing the concrete, have proved satisfactory in many instances, while in others a brick-lining has been introduced. The desired result can, however, be obtained by a lining of well-chosen cement and sand properly applied. Where such a finish is specified it should be applied immediately the centering is removed and while the concrete is yet "green." If this cannot be done, and the concrete is allowed to "go off," it should be freed from dust, &c., thoroughly wetted, and washed with grout as the application of the lining proceeds. The density of the finished work will depend to a great extent upon the amount of labour expended upon it, therefore the face should be worked up to a hard-polished finish from the steel trowel. A slow-setting cement should be used with fine sand, and too much rather than too little water.

For pressures of up to two and one half atmospheres a 1-in. facing of cement and sand, 1 to 2, laid in one body either on the centering immediately before the concrete or on the concrete after the removal of the forms, has proved effective.

For pressures of up to six atmospheres the facing should be laminated or put on in coats—the first coat of half to three-quarters of an inch of cement and sand, 1 to 2; the second of about a quarter of an inch, 1 to 1, trowelled to a hard polished surface, and a final wash of thick grout.

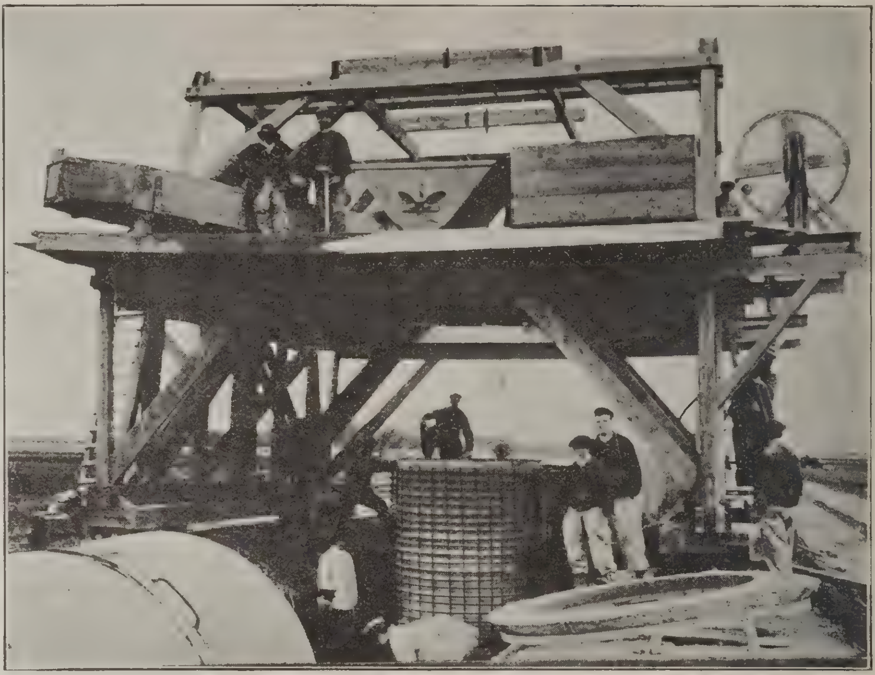

FIG. 7.—BONNA BAR REINFORCEMENT.

To Withstand Pressure.

It has yet to be proved that concrete pipes can be safely relied upon to resist heads of water exerting a pressure of more than six atmospheres, but though even a carefully-built pipe may be found to sweat a little at first, or even to crack slightly, owing to shrinkage or other causes, it invariably "takes up" with sediment and lime deposits from the water flowing through it, and thus in a short time becomes perfectly watertight.

The general arrangements for the carrying out of the work should be left to the contractor, but complete and careful supervision is necessary. The materials must be well chosen, properly prepared, frequently tested, and carefully put in place. The forms should be made in lengths convenient for handling and for the amount of work that will be done in a given time. The reinforcement should not only be laid, but it should also be fixed in position, so that there may be no possibility of its losing its correct position by the throwing and ramming into place of the concrete. Its members should be left protruding a few inches beyond each deposit of concrete to form a bond between that already laid and the fresh material; and to obtain a continuous reinforcement, rods, &c., should be overlapped and wired together, and meshwork should be overlapped at least one mesh.

Mixing the Concrete.

The concrete should be thoroughly mixed not less than twice dry and twice wet; and clean, fresh water should be used. Further, the concrete should be mixed as near as possible to the spot where it will be required, placed in position immediately it is mixed, not jarred after it has been laid in position, and protected from falling water and rain and excessive cold and heat.

The few typical sections shown in the illustrations will give some idea of how this form of construction can be adapted, but practically any requirements can be met. In all cases the position of the reinforcement in the concrete should be governed by the strains, pressures, &c., that the pipe is required to withstand. If it is to resist a head of water the tension member should be placed near the outer face of the concrete, while if the greater pressure will be exerted from the outside the section must be designed according to the nature of the soil in which it is to be built, most cases being met by placing the tension member eccentric in the concrete—running from near the underside of the invert to near the outside at half height, and thence to

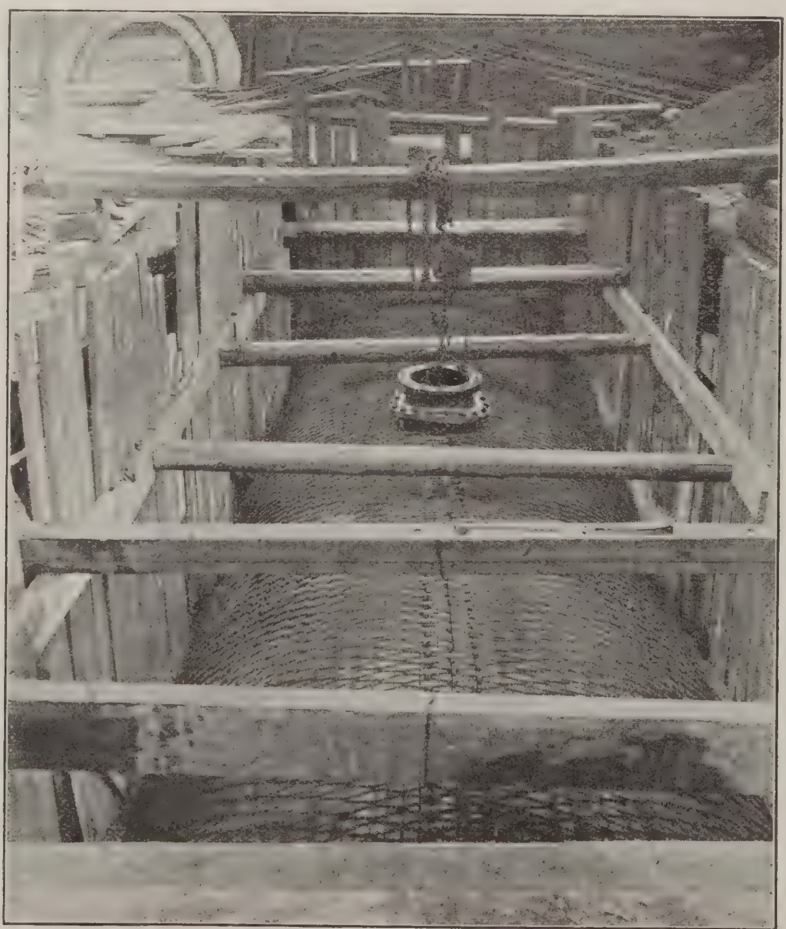

FIG. 8.—EXPANDED STEEL REINFORCEMENT.

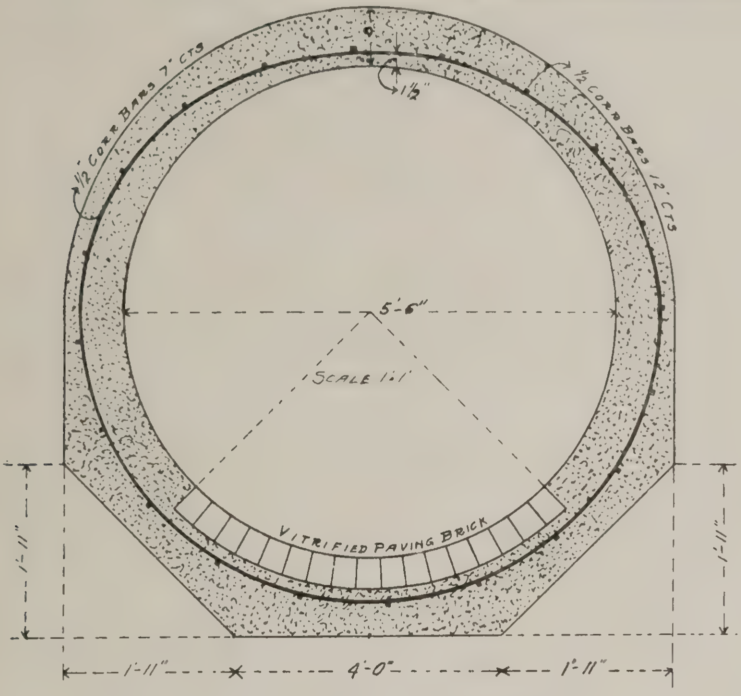

FIG. 5.—INDENTED BAR REINFORCEMENT.

near the underside of the crown. Where bad ground has to be dealt with a wide base section or a foundation raft should be used.

Calculations.

Lastly, with regard to the method for calculating the proportions — generally speaking the thickness of the concrete shell should in no place be less than one-twelfth of the greatest internal diameter of the tube, while the steel reinforcement should be designed to resist the whole of the tensile stress. Where the safe tensile stress in the steel is 8 tons per sq. in., $P =$ the pressure in lbs. per sq. in., and $r =$ the internal radius in inches, the weight of reinforcement per square foot $= \frac{Pr}{450}$, while its area at each side of the pipe per longitudinal foot, where $f =$ safe tensile stress in the reinforcement in lbs., $= 12\frac{Pr}{f}$.

WHAT CONSTITUTES REINFORCED CONCRETE?

The question which heads this article may seem to some persons superfluous, but there is considerable misunderstanding of the real nature of reinforced concrete among the architectural profession and the public generally. The misunderstanding probably arose from the fact that all the terms given to this combination of materials somewhat inadequately represent its true nature.

In France we find the term "ciment armé" in general adoption, and we have its English equivalent in "armoured concrete." These are, obviously, incorrect terms, because, in the first case, it is not cement, but concrete, that is used, and in both cases the concrete is not armoured, which would mean that it had metalwork applied on the outside, whereas just the opposite is the case, the metal being placed internally.

The term "ferro-concrete" has also been suggested, and used to some extent, but this simply means "iron concrete," and though it would be a perfectly legitimate expression for concrete cemented together by the use of iron filings, as a kind of rust cement, it is incorrect as a description of a combination of metal and concrete where each retains its original properties and bears its proportion of the stresses in a structure.

The term "concrete-steel" is used to a considerable extent in America, but this hybrid is obviously inexpressive—as inexpressive as "ferro-concrete."

We, ourselves, have adopted, as the best way out of the difficulty, the term "reinforced concrete," but this gives undue prominence to only one of the two materials, and it would be almost as inappropriate to say "reinforced steel."

The fact is, we want some short expression which shall mean "concrete combined with steel."

The terms "strengthened" or "stiffened" concrete would be plainly inferior to the term "reinforced concrete." The last tends to include too much. Under "reinforced concrete" would come half-timber construction, lath and plaster, wattle-and-dab, and, indeed, the form of construction adopted by the Romans where tiles were used to form permanent centerings for domes, vaults, and to face and bond walls.

Reinforced concrete work to-day is confined to metal (more generally steel) and concrete. We must be careful, however, not to give the term too narrow a limitation. Some specialists with particular systems seem to suggest that steel in reinforced concrete work must not be in any complicated form, but of the most simple and elementary sections framed and held together merely by the concrete. Such, however, is an unwarrantable assertion, because although it may be an argument in connection with their particular systems that there is little or no manufactured work to be done to the steel, it is too much to ask us to limit the whole subject to their way of thinking.

If we are to be limited in this way, where shall we place such systems as the Melan and Wünsch, the Bonna, the Columbian, the Kahn, even the Expanded Metal and the Roebling, and, indeed, the ordinary steel joist and concrete floor?

These are all legitimate developments of the primary principles of reinforced concrete work—*i.e.*, the use of concrete, firstly, to replace steel with a view to economy; secondly, to give stiffness and a more or less impervious surface, keeping out moisture and gases and preventing corrosion, such as in floors, walls, pipes, piles and other structures; thirdly, to protect the steel against the destructive influence of fire.

Reinforced concrete is the name we give to the combination which conforms to one or more of these conditions. While it fulfils the first function it more or less fulfils the others, and the first consideration has been pressed as the be all and end all of reinforced concrete. But if it were not for the economy of reinforced concrete over other methods of erecting structures, we should not find it so largely adopted. Final economy may be found in the resistance to corrosion and safeguarding against fire, but it is more generally due to the economy in the direction of the much smaller cost of the materials and labour necessary in making the concrete used in a structure as compared with the steel bulk for bulk. Concrete is, however, deficient in resistance to tensile stresses. It has a certain amount of resistance, and, of course, can be, and is, used alone, but the use of a sufficient quantity of steel to make up for a certain amount of its deficiency in this respect enables the concrete to be reduced in quantity, and perhaps in the quality, of the ingredients of which it is composed. Steel will allow reduction in the amount of concrete, but if the concrete is reduced too far, then the steel has to be increased proportionately.

The point to be determined is where the greatest economy is obtained. It matters not how much work we put into the manufacture and manipulation of the steel reinforcement if economy results therefrom. For instance, it may be preferable to make the steel structure self-sustaining, so as to be able to place it in a position as a whole upon the centering without becoming distorted by being lifted into position or by the deposit of the concrete around it. Economy may also result from making the frameworks beforehand in such a manner that it may be possible to transport them to the site where the concreting and the moulding is to take place. It is a well-known fact that this is commonly done in the case of pipes, and there might be an advantage in proceeding in the same manner with piles. Such would, of course, necessitate frameworks having a certain rigidity.

Again, it may be found economical to save space by reducing the amount of the concrete by using an increased amount of steel. Economy may come from using an additional amount of steel, or by so forming the reinforcement, that parts of construction such as pillars or piles may be manufactured away from the position in which they will be finally placed, and be able to be transported and lifted in a horizontal position without being damaged by assuming a position not their eventual one. Also in connection with pipes, whereas they may not be subjected to flexure when placed on a solid foundation, yet it may be desirable to give them extra stiffness, so that they can be lifted by means of cranes, &c.

Again, in arches and chimneys it is convenient and economical to use special sections, such as tees and angles, and to rivet the reinforcement together (for instance, the Melan arch). Indeed, in beams we are beginning to recognise the advisability of rigid attachment of the shear members to the bottom reinforcement, and it may be desirable to rigidly connect the

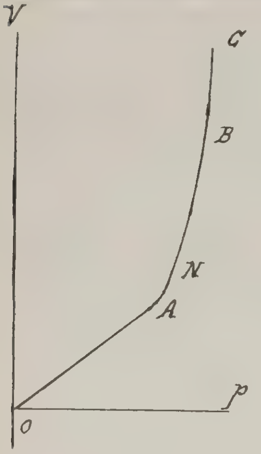

FIG. 1.

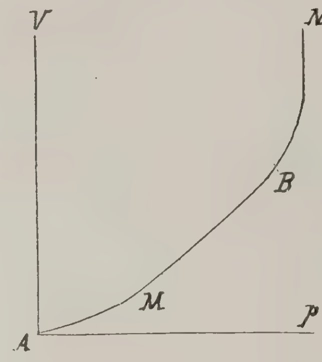

FIG. 2.

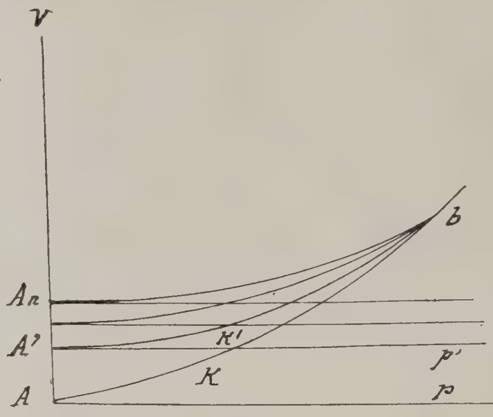

FIG. 3.

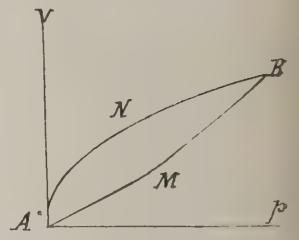

FIG. 4.

top reinforcement as well. In bridge construction we find large trusses constructed of reinforced concrete and the points of juncture between the members riveted.

It is advisable generally to continue to use sections of steel which are regularly manufactured and to be obtained cheaply, but as we have said above, circumstances may make it desirable to avail oneself of steel sections other than the ordinary, and to put extra labour into the construction of the reinforcements. In short, it does not matter what means and methods we adopt so long as concrete and steel are used together for their mutual advantage to obtain efficiency with economy in the final result, and such means and methods may be termed "reinforced concrete," "ferro-concrete," "armoured concrete," "concrete-steel," or any other term that expresses the same association of the two materials in structures.

STRAINS IN REINFORCED CONCRETE SUBJECTED TO FLEXURE.

By N. de Tedesco, Ingénieur des Arts et Manufactures, Rédacteur en Chef du "Le Ciment."

Various theories have been advanced regarding the stresses carried by reinforced concrete constructions subjected to flexure. The basis of these theories is, of course, intended to be the experimental researches upon the mechanical properties of concrete and steel. Unfortunately such researches are not easily carried out, because the strength and the elastic behaviour of concrete are influenced by many conditions—namely, the quality of the ingredients and their proportions, the quantity of water used in mixing them, the climatic conditions during the process of hardening, and many other circumstances. Nevertheless M. Souleyre, Ingénieur des Ponts et Chaussées, and M. Anglade, Conducteur des Ponts et Chaussées, both resident in Constantine, Algeria, have shewn (the first named in France in 1894) that the general laws of resistance found for iron and steel may be applied to some extent to stony materials.

The general laws referred to are well known. The materials used by builders are not perfectly elastic. When the load is gradually increasing, the material is to be considered elastic only during a first period; in a second period preceding rupture it appears as ductile, a portion of the lengthening or shortening subsisting after the load has been removed. The curve of deformation corresponding to increasing loads is illustrated on Fig. 1. The first portion OAN may be divided itself into two parts OA, nearly a straight line (period of proportionality), and AN preceding the period of ductility and large deformations.

The curve obtained by MM. Souleyre and Anglade for cement mortar under compression (Fig. 2) agrees rather well with Fig. 1; it shows that the functions between the periods are more marked. The mortar used was mixed in the proportion of 835lbs. of cement per cubic yard of sand.

These engineers state that in the neighbourhood of rupture the straight line MB is abruptly altered into a line BN which tends to become parallel to the axis AV. This sudden increase in the deformation corresponds to the stricture in an elongated bar—namely, to the sudden decrease in the sectional area.

The portion BN of the curve of compression was only to be observed with mortar and soft woods. With the hard stones, the point B is too near rupture to allow the deformations BN to be observed. Breaking occurs abruptly, and it can be said that for stony materials the portion BN is to be considered practically as *nil*. In metals the period BN may very likely exist for compression as well as for extension.

In mortars the point B corresponds to a ratio of the breaking load, which is estimated at from one-third to four-fifths according to the age, the nature and the hardening process.

This point B is very important; it is in its neighbourhood that the deformations cease to be proportional to the stresses, and permanent set becomes considerable. The point B is also the limit at which repeated loading produces deformations increasing indefinitely until rupture occurs. The effect of this repetition of loads may be described as follows, so long as the ultimate stress does not attain the point B (Fig. 3): When the stress has reached the point *b* which is within the curved portion AM of the line of compression, the permanent set is AA'. If we now load the specimen again the curve of deformation is plotted with the stresses as ordinates starting from the line $A'p'$ parallel to Ap. For the stresses increasing till the first limiting stress be attained, the compression line $A'K'b$ will differ from AKb, but in the neighbourhood of the point *b*, the two curves will tend to coincide. If the unloading and re-loading are repeated several times it may be stated that:—

(1) The point A tends to assume a position A_n as a limit.

(2) The various curves tend to coincide at the point *b*.

(3) Starting from point *b*, the curve of deformation would have been nearly the same as in the first experiment, if the stress had attained the point *b*.

For mortar the repetition of loads tends to transform the curved lines into straight lines, if the point *b* does not reach B, but when the limit of elasticity is exceeded, the compression lines obtained in loading tend to coincide with those obtained on removal of the loads. These curves are illustrated for the first experiment in Fig. 4. AMB is the curve of increasing and ANB the curve of decreasing loads. These two lines differ principally in the neighbourhood of origin. If the pressure attains a point B corresponding to the limit of elasticity, the two curves very nearly approach an intermediate straight line drawn through the point of their greatest extension.

MM. Souleyre and Anglade found from experiments three months after moulding on cubes of about 6ins. average limits of elasticity of about 1,280lbs. per sq. in.—that is, about 62 per cent. of the ultimate strength. The average moduli of elasticity were found equal to about $1{\cdot}76$, $2{\cdot}37$ and $2{\cdot}87 \times 10^6$ lbs. per sq. in.

The Souleyre and Anglade curve has been confirmed by the very accurate experiments of Professor Bach on cylindrical pillars, 1 metre long (about 3ft. 3½ins.) and about 10ins. in diameter. The results of these researches allowed even a mathematical expression of the general relation between the unit pressure σ and the deformation per unit of length e of whatever material—namely, $e = \frac{1}{E}\sigma^m$; E being the modulus of elasticity of this material, and m a coefficient varying for concrete with the quality of cement, the nature of ingredients and the proportions of the mixture. This formula has been translated into Imperial measures by Mr. Charles F. Marsh in his treatise "Reinforced Concrete," and applied to various mixtures and pressures; some curves he obtained in plotting the value of E for stresses from 100lbs. to 1,000lbs. per sq. in. are illustrated in Fig. 5. It can be seen that the coefficient of elasticity from 100lbs. to 1,000lbs. pressure decreases less and less rapidly. From 100lbs. to 200lbs. pressure the average value of E is $3{\cdot}15 \times 10^6$; the decreasing pressure, 3×10^5, corresponds to 9·55 per cent. per 100lbs. of increasing pressure. From 200lbs. to 400lbs. pressure the average value of $E = 2{\cdot}85 \times 10^6$; the decreasing pressure being 3×10^5, or 5·25 per cent. per 100lbs. of increasing pressure. From 400lbs. to 800lbs. the average value of $E = 2{\cdot}575 \times 10^6$

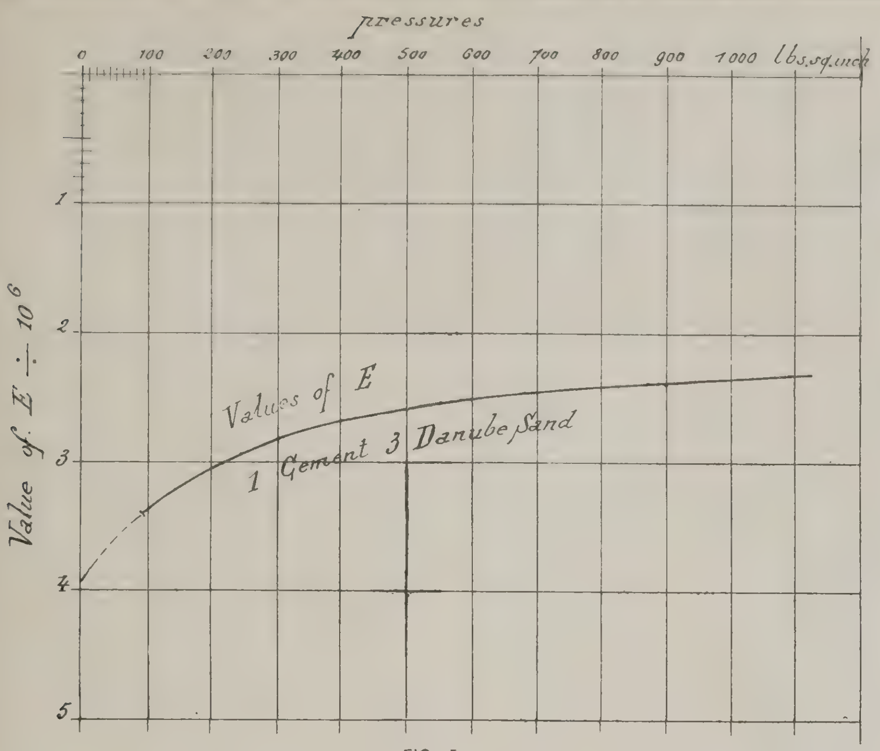

FIG. 5.

the decreasing pressure being $2{\cdot}5\times10^5$, or 2·43 per cent. per 100lbs. of increasing pressure. We may say, moreover, that the pressures allowed in designing being of about 600lbs., corresponding here to $E=2{\cdot}5\times10^6$, the most important variation from 100lbs. to 600lbs. pressure is to be considered as equal to $0{\cdot}7\times10^6$—that is, equal to 28 per cent.

Let us investigate further the influence of the value of the modulus E on the stresses carried by a reinforced concrete member, taking a slab for example. Let p = the percentage of the extended reinforcement, n = the ratio between the modulus of elasticity of steel E_s and the modulus of concrete E_c. As E_s is constant, n is inversely proportional to E_c. The depth and the breadth of the slab is assumed to be 1in. The depth is intended to be measured from the axis of the reinforcement to the ultimate compressed fibre. This slab is designed for a bending moment of 100 foot-lbs. per foot, or inch-lbs. per inch. Let $p = {\cdot}007$ (or ·7 per cent.) x and $1-x$ = the distances from the neutral axis to the centre of the reinforcement and to the ultimate compressed fibre respectively. M = bending moment, r_c the ultimate unit compressive stress of the concrete, and R_s the unit tensile stress of the steel.

The three equations for the calculation of a slab are:

$$(1)\ x=1+np-\sqrt{(1+np)^2-1}$$

$$(2)\ M=r_c\left[\frac{(1-x)^2}{3}+np\frac{x^2}{1-x}\right]$$

$$(3)\ R_s=nr_c\times\frac{x}{1-x}$$

Applying these equations to the data given above and successively to $n=10$, 15 and 20, we get:

When $n=10$

$$x=1+10\times.007-\sqrt{1{,}070^2-1}=.688$$

$$1-x=.312$$

$$M=r_c\left[.033+.07\times\frac{.688^2}{.312}\right]=r_c\,[.033+.106]$$

$$=r_c\times.139=100$$

$$r_c=\frac{100}{.139}=720\text{lbs. sq. in.}$$

$$R_s=720\times10\times\frac{.688}{.312}=15850\text{lbs. sq. in.}$$

When $n=15$

$$x=1+15\times.007-\sqrt{1.105^2-1}=.635$$

$$1-x=.365$$

$$M=r_c\left[.044+.105\times\frac{.635^2}{.365}\right]=$$

$$r_c\,[.044+.116]=r_c\times.160=100$$

$$r_c=\frac{100}{.160}=625\text{ lbs. sq. in.}$$

$$R_s=625\times15\times\frac{.635}{.365}=16{,}300\text{lbs. sq. in.}$$

When $n=20$

$$x=1+20\times.007-\sqrt{1{\cdot}14^2-1}=.592$$

$$1-x=.408$$

$$M=r_c\left[.055+.14\times\frac{.592^2}{.408}\right]=$$

$$r_c\,[.055+.120]=r_c\times.175=100$$

$$r_c=\frac{100}{.175}=571\text{lbs. sq. in.}$$

$$R_s=571\times20\times\frac{.592}{.408}=16{,}560\text{lbs. sq. in.}$$

As a result of decreasing the value of E_c (or increasing n), we observe that

x and r_c decrease with the value of E_c
R_s increases ,, ,, ,, ,, ,,

These deductions are recapitulated in the following table:—

Value of n.	x	Moments of resistance.			Maximum Stresses.		Decrease of Stress in Concrete.	Increase of Stress in Steel.
		Concrete.	Steel.	Total.	Concrete.	Steel.		
10	·688	23·80	76·50	100·30	720	15,850	95 $\frac{95}{625}$ = 15·2p. c.	450 $\frac{450}{16300}$ = 2·76 p. c.
15	·635	27·50	72·50	100	625	16,300	54 $\frac{54}{625}$ = 8·69 p. c.	260 $\frac{260}{16300}$ = 1·6 p. c.
20	·592	31·40	68·50	99·90	571	16,560		
1	2	3	4	5	6	7		

It is to be noted that the proportion of the bending moment supported by concrete increases with n, and that the proportion supported by the steel decreases (see columns 3 and 4).

It should be noted also that if we wish to attain simultaneously 635 and 16,600lbs. for the maximum stresses in concrete and steel respectively, the formula expressed in Imperial measures is very handy. Let h be the depth in inches of the slab, from the compressed face to the centres of the reinforcement bars; we have:

$$h=\sqrt{\frac{M}{100}}$$

and the percentage of steel will be ·7 per cent. of h, or ·084 h per foot in square inches. The total depth of the slab will be $h+1$in.

Then if E_c is asumed to be constant and the stress-strain curve to be a straight line, an error of 28 per cent. in the value of E_c would correspond at most in the concrete to $\cdot28\times\cdot152=\cdot0425$ or 4·25 per cent., and in steel to $\cdot28\times\cdot0276=\cdot0079$ or ·7 per cent. The value of these errors not being of any importance, the assumption of a straight line for the stress-strain curve is most practical and suitable.

It seems now quite useless to inquire into the influence of the value of E on the real position of the neutral axis and on the values of stresses carried by compressed concrete or extended steel, as we should find differences of the same insignificant order, and especially as the latest tendency is to consider the strength of extended concrete as nil. Of course, the effect of the variability of E upon the deformation is of first importance, but fortunately for engineers the solution of this problem is not required. They have already enough trouble in economically designing buildings in conformity with the allowable stresses, and it can be said that rapidity of calculation is for reinforced concrete constructions a question of "to be or not to be."

REINFORCED CONCRETE SYSTEMS.

V.—The Johnson Indented Steel Bar.

In this article we deal with one of the foremost systems of reinforced concrete construction in the United States—a system which has been recently introduced into this country. It is six or seven years since Mr. A. L. Johnson, M.Am.Soc.C.E., invented this form of bar, rolled so as to give mechanical bond between the reinforcing metal and the concrete. The bar is known in America as the Johnson "corrugated" bar, from the fact that it was at first rolled with corrugations upon the four faces of a square bar, which latter formed the minimum section. As, of course, the strength of a bar is the strength of its weakest part, these corrugations meant an increased quantity of metal, added for the sole purpose of mechanical bond. A new section of bar, however, was arrived at later, and this bar is the one which is being manufactured in this country and termed the "Indented" steel bar. In this not only is mechanical bond secured, but the bar has

a uniform section throughout

the form being as shown in Fig. 4, which, it will be seen, consists of an alternated oblong section.

The firm manufacturing these bars in the United States is known as the Expanded Metal and Corrugated Bar Co. of St.

Louis. This company was at first one of the several companies manufacturing and using "expanded metal," and **Mr. A. L. Johnson** was its consulting engineer. It was in consequence of his being engaged in the design, construction, and supervision of reinforced concrete work for the company that he was led to invent this particular form of reinforcing bar.

In order to understand the advantages which the bar offers in reinforced concrete work it is necessary to go into the theory of the subject, for the many points in its favour are not exactly obvious upon inspection, and though tests have shown the superiority of indented bars we all like to know the reason why. Firstly, we may draw attention to the importance of **adhesion** between the concrete and the reinforcing steel rods or bars. The adherence of concrete to steel has been variously estimated at from 200lbs. to 700lbs. per sq. in. by various investigators and engineers, but Considère assumed the value to be 250lbs. to 500lbs. per sq. in., and generally upon his statement it has been customary on the Continent to assume as a safe working stress 50lbs. per sq. in. It has been shown, however, by later experiments, that the adhesion of concrete to steel was a very questionable item in reinforced concrete work. For instance, Breuillé, in 1902 carried out experiments which showed that immersion of the concrete in water for nine months **reduced the adhesion** by one-half to two-thirds. It is obvious also that if the rods get coated with oil, paint or similar substance the adhesion will be entirely destroyed. Again, it is easy to see, as Professor Schule, of Zurich, demonstrated in 1904, that when the bars are under stress their cross-section is slightly reduced, and this reduction must materially affect the adhesion, which simply consists in the entering of the concrete into the microscopic pores on the surface of the metal (for this reason it is generally recommended to leave the mill scale and rust upon the rods). Vibration, again, will undoubtedly cause the adhesion to be still further reduced in course of time. Finally, it is obvious that a bar, of a diameter **such as is used in practice,** of, say, 1in. or 1¼in., will require to be embedded or anchored a considerable distance in the concrete in order that the adhesion reckoned as so many pounds to the square inch of the surface of the bar may be equal to the stress desired to be developed in the bar. For instance, supposing we have a round rod of 1 sq. in. section, the surface will be approximately 3½ sq. ins. per inch run. Assuming adhesion of 50lbs. per sq. in., in order to develop a stress of 16,000 lbs., say, in the steel, it is obvious that the bar would have to be embedded in concrete a distance of

$$\frac{16,000}{50\times3\frac{1}{2}}=\frac{640}{7}=91\text{ins.}=7\text{ft. }7\text{ins.}$$

In the majority of cases, of course, such a distance could not be allowed, and in practice there is little or no factor of safety in regard to adhesion. The adhesion which is given by a mechanical bond in the bar is of the **utmost importance in the shear members,** because their short length — namely, the depth of the beam — is obviously too little to enable the required strength to be developed in the short distance available. It is only to be expected that instances should arise where the adhesion has been found insufficient after some years' service. In the United States, where reinforced concrete beams have been constructed for a good many years, such weaknesses have made themselves apparent. It is almost certain that the same will be found on the Continent. Indeed, it seems that these facts are admitted, because the German official regulations state **the advisability of mechanical bond** between the concrete and the metal.

Such mechanical bond has been given to bars in various ways, among which may be mentioned twisting. It is obvious that the resistance of the latter is greater than that of the plain rod, but only in proportion to the slightly greater length of the screw line to the axial length. With projections on the bar, however, the resistance is greatly increased, and not, as might be supposed, merely to the extent of the shearing resistance of the concrete embedded between projections, for the projections of the bar form the tops of cones of resisting stress which gradually widen out into the concrete from these points.

There is a tendency with projections upon a bar, unless they exceed the angle of friction between concrete and steel, to split the concrete. The indented bar patents, however, cover all bars that can be rolled which will fulfil this condition.

It will no doubt appeal to English engineers as a reasonable precaution, in view of such wide variations as may occur in the adhesion of concrete to steel, to be able to rely upon some more certain bond, and this the indented bar offers.

The indentations or projections of this bar serve **a further purpose,** however, which is, if anything, of hardly less importance than the foregoing. Considère, as a result of his first experiments, concluded that concrete reinforced with steel would stretch much beyond what it would when unreinforced. This was subjected to criticism, and he repeated his experiments, and, although he came to the same conclusion as before, the experiments were far less conclusive than at first. Prof. F. E. Turneaure, of the University of Wisconsin, recently made a series of careful tests on reinforced concrete beams, which seem to prove without much opportunity for doubt that Considère, as one would have supposed from theory and common-sense, was wrong. Prof. Turneaure tested beams upside down which had been kept under water until tested, and he observed that at certain points lines of moisture made their appearance.

These lines he marked with chalk, and although a magnifying glass did not reveal cracks, when portions were cut out between chalk marks and containing chalk marks after the loads on the beams had been removed, those containing chalk marks fell apart at the marks, whereas the others did not and when tested were found uninjured by flexure. It was obvious from this that concrete does crack when it reaches its elastic limit. The metal reinforcement has, however, undoubtedly the tendency of distributing the extension fairly uniformly along the length of the beam, and enabling each portion of the concrete to take its maximum elongation. But once cracks are developed they become extended more and more under increase of load, and it is possible to obtain with a considerable deflection large cracks which expose the reinforcement to corrosion. The indented bar, however, will ensure a very large number of fine cracks (so fine that there is no fear of corrosion) instead of a smaller number of large ones.

The indented bar is made of **high elastic limit steel,** the argument in favour of this being that, beyond the elastic limit, the stretching goes on increasing under repeated loading without recovery after removal of loads, and, consequently, the cracks in the concrete gradually widen as the deflection increases until the structure fails. There is no doubt that the use of ordinary factors of safety is very unscientific, and the Patent Indented Steel Bar Co., Ltd., press the point that the factor of safety for reinforced concrete construction should be based on the capacity of the structure at the elastic limit of the metal reinforcement. This factor of safety should, in their opinion, be generally not less than 4. As most of our readers are probably aware, it is usual to allow a working stress in steel of about 16,000lbs. per sq. in. As mild steel has an elastic limit of about 30,000lbs. per sq. in., there is really a factor of safety of less than 2, although the working stress is one-quarter of the ultimate strength—namely, 64,000lbs. per sq. in. Now, not only is the ultimate strength of high elastic limit steel considerably higher, but the elastic limit is 55,000lbs.

With an elastic limit of about 30,000lbs. per sq. in. the economical quantity of metal reinforcement is 1·4% of the area of the concrete upon a factor of safety of about 4, but with an elastic limit of 55,000lbs. the actual percentage becomes ·7. Thus it will be seen there is a saving of 50% in the amount of metal required effected by the use of higher limit steel.

The only objection to the use of high carbon steel we have heard made is that some engineers think that the advantages due to the additional strength so obtained are to some extent offset by the loss in ductility. The rolling mills manufacturing the bars have to work to a specification which prevents brittleness. The elongation in 8ins. of the material is from 15 to 17 per cent., which shows that the bars have considerable ductility. The indented bar can be rolled of any grade of steel desired.

Such are briefly the chief points connected with the bar, and they are applicable to any theory of calculation. The theory and practice of the patentees, naturally, is compiled to take the greatest advantage of all the favourable points of the bar. We realise when we closely investigate the subject how the indented bar results in much economy, and in fulfilling almost all conditions with a refreshing directness. The engineers to the manufacturers of the indented bar are some of the foremost experts on the subject of reinforced concrete, and the recent catalogue which has been published by the company forms one of the best treatises on the subject. Every praise is due to the company for the manner in which it places all the facts before the architectural and engineering professions without endeavouring to mystify anyone in the slightest degree. The company seems determined to state the whole facts and trust to the commonsense of the public to appreciate the advantages.

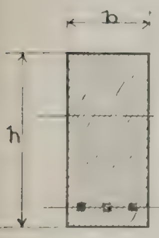

Fig. 1

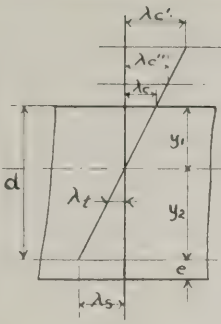

Fig. 2

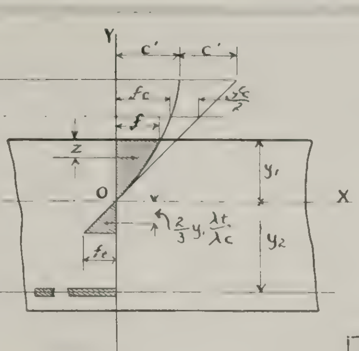

Fig. 3.

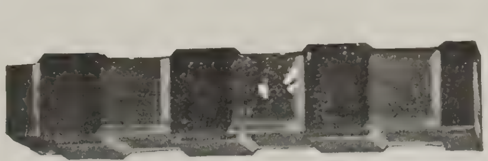

FIG. 4. THE INDENTED BAR.

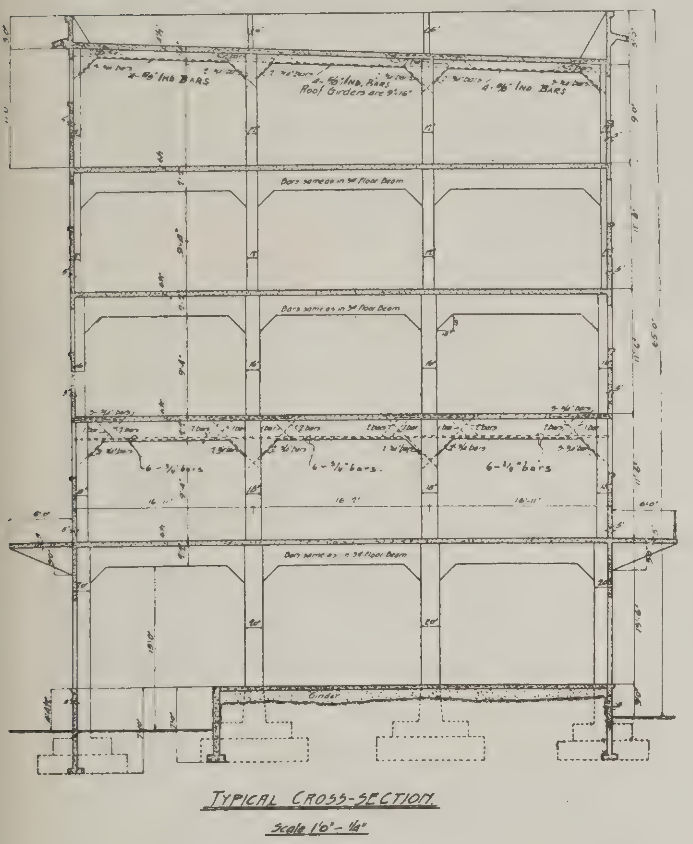
4-5/8" Ind Bars
4-5/8" Ind. Bars Roof Girders are 9"×16"
4-5/8" Ind Bars
Bars same as in 3rd Floor Beam
Bars same as in 3rd Floor Beam
6-3/4" bars
6-3/4" bars
6-3/4" bars
Bars same as in 3rd Floor Beam
Cinder
65'0"
TYPICAL CROSS-SECTION
Scale 1'0" – 1/4"

FIG. 5. TYPICAL WAREHOUSE DETAILS.

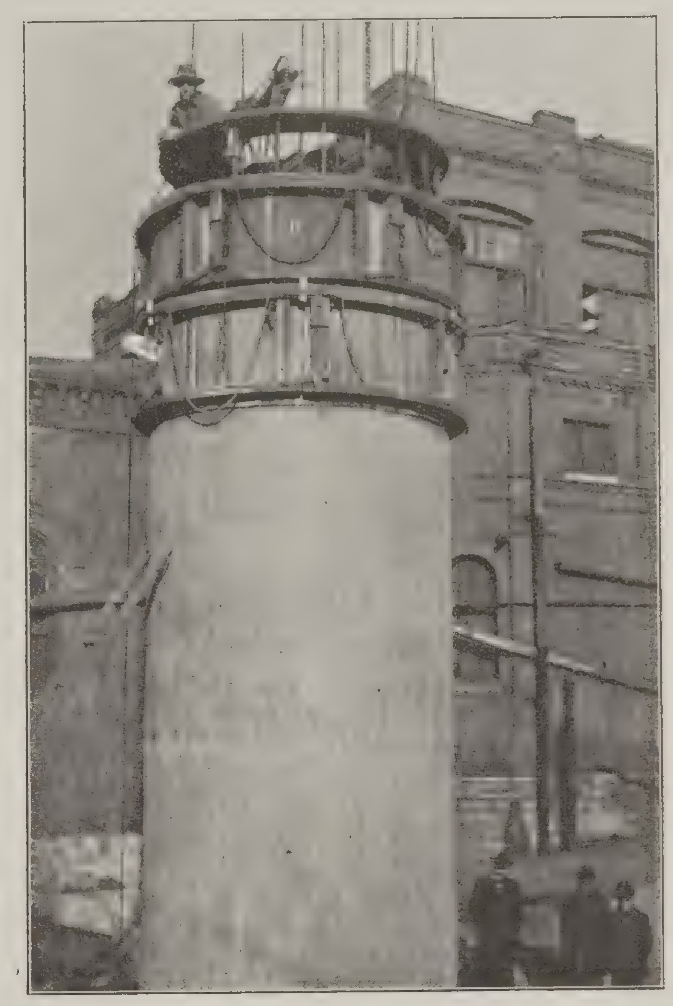

FIG. 9. CHIMNEY IN COURSE OF CONSTRUCTION FOR THE ST. LOUIS BREWING ASSOCIATION.

Standard Sizes of Indented Bars.

The following table gives the standard sizes in which indented steel bars are manufactured:—

Size (ins.)	Nett Section (sq. ins.)	Weight per lineal foot (lbs.)	Size (ins.)	Nett Section (sq. ins.)	Weight per lineal foot (lbs.)
1/4	·06	·24	3/4	·56	1·91
3/8	·11	·38	7/8	·77	2·60
1/2	·25	·85	1	1·00	3·40
5/8	·39	1·33	1¼	1·56	5·31

These bars are supplied by the company at standard prices per ton, which amounts cover any cost they may be put to in the preparation of designs and submitting estimates. There are no royalties to pay with this system. Any architect or engineer, if he chooses, can design the work himself, or the company's engineers will prepare details, making all necessary calculations, and they will give a quotation for the supply of the bars. The actual work of construction can be tendered for by contractors upon the plans and quantities.

The theory for the design of beams embodied in the company's catalogue includes the latest reasoning and the results of the latest investigation on the subject of reinforced concrete, and we therefore reprint diagrams which will show the chief points.

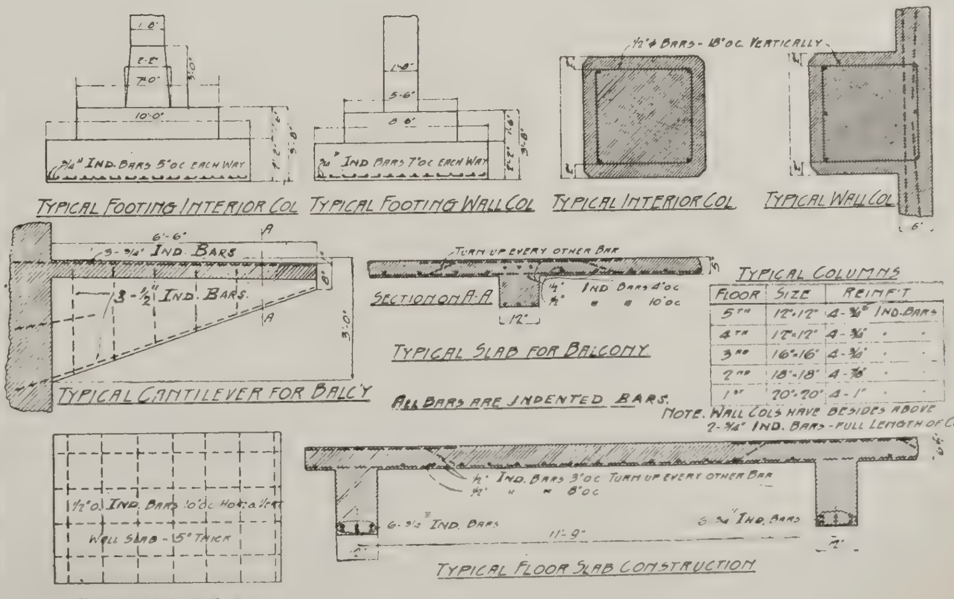

FIG. 6. TYPICAL WAREHOUSE DETAILS.

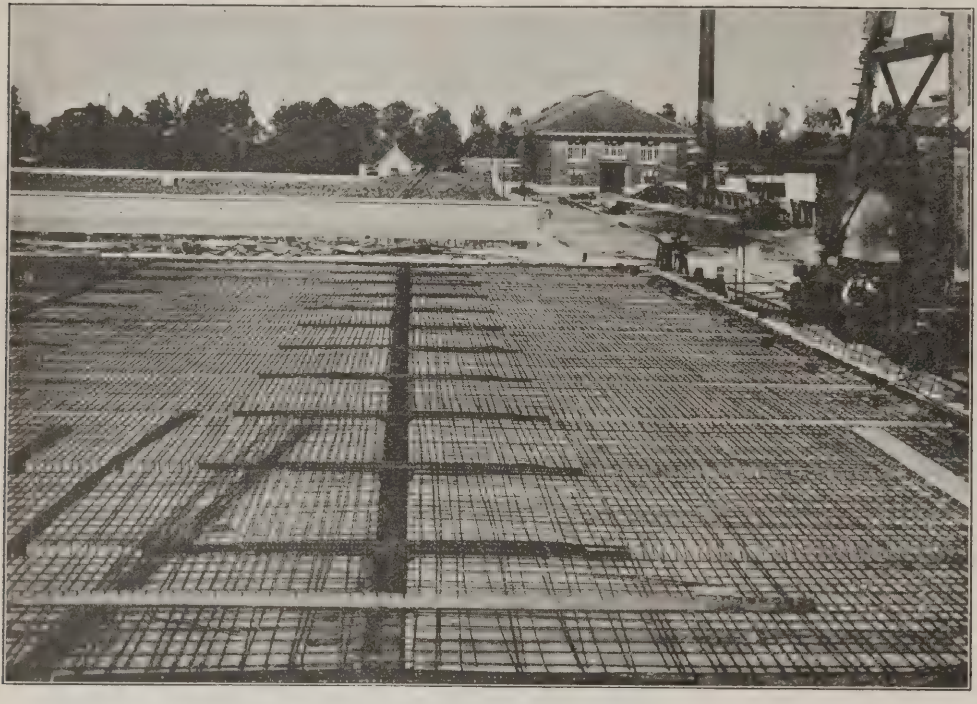

FIG. 7.—TOP OF RESERVOIR UNDER CONSTRUCTION FOR THE INDIANAPOLIS WATER CO.

Firstly, it is assumed that plane sections remain plane after bending, and although this is not absolutely correct, it is near enough for practical purposes, and makes the analysis clearer. Fig. 1 shows a cross-section of a beam, fig. 2 the strain or deformation diagram, and fig 3 the stress-strain diagram. Now, the company's engineers, in addition to their advocacy of other reforms, insist upon the importance of designing structural members for the ultimate loading, and not inserting safe values in the formulæ, which render it impossible to tell what real factor of safety is obtained. Thus, they design a beam to sustain as its ultimate breaking strength four times as great a load as is estimated to be sustained. In consequence of this they rightly take the stress-strain curve of the concrete in compression not as a straight line, but as a parabola. Instead of

the vertex of this parabola,

however, being put at the top of the beam, where Prof. Talbot places it, the modulus at rupture is taken at two-thirds of the initial modulus of elasticity, and in consequence the vertex of the parabola rises above the top of the beam. This is shown in Fig. 3, where the initial modulus, if not reduced, would cause the stress-strain curve to be a straight line, but the reduction of the initial modulus brings the curve to the position of the shaded area shown, f_c being the greatest compressive strength of the concrete and c' the abscissa at the vertex of the parabola. It seems to be pretty generally recognised now that the modulus of elasticity of concrete decreases as the stress increases, and the assumption of the modulus at rupture being two-thirds the initial modulus is the result of the examination of the results of a number of tests on full-sized beams.

In the discussion the stress taken by the concrete in tension is also considered. f_t is the modulus of concrete in tension at rupture; that is to say, the tension is limited to the shaded portion in Fig. 3 by reason of the stress below this point having exceeded the strength which the concrete would bear. It may be well to state here that at ultimate loading the effect of the tension in the concrete is negligable.

The analysis of the stress and deformation in a beam are somewhat intricate and need not be repeated here, but as a result of a very complete discussion simple formulas are arrived at to serve for the purposes of practical designing. The following constants used by this company for different kinds of concrete as the result of experiments are interesting:

Kind and Proportions of Concrete.	Crushing Strength (lbs. sq. in.)	Modulus of Elasticity
Average Rock Concrete 1 : 3 : 6	2,000	2,600,000
Good Rock Concrete 1 : 2 : 5	2,700	2,800,000

The greatest elongation the concrete will take in tension before rupture is the same for both concretes—namely, ·00015.

The analysis which the company gives in its catalogue for the stresses in

T-beams

is particularly interesting. For the first time, so far as we are aware, the width of the table of the **T** is calculated. This width is usually assumed in calculations, but it is shown that the amount of compression that can be calculated as taken by this portion of a **T**-beam is dependent upon the resistance to shear of the concrete at the junction of the rib with the table. As all the compression in the table is put into it by shear along the plane of junction, it is evident that the total compression cannot be greater than the shearing strength of the concrete along this plane.

The shear stresses

in beams are also dealt with in the catalogue in a careful manner, and we may mention here that the practice in providing against shear stresses in beams constructed with indented steel bars is to turn up the bars one after the other as the supports are approached, the distances apart of these vertical reinforcements being gradually lessened towards the points of support. Bars can be turned up in this manner as the bending moment gets less towards the supports, and consequently a smaller amount of metal is required. Of course the ends of the bars being thus turned up means that a rigid attachment of the shear members to the bars is obtained.

It now only remains for us to deal with various adaptations of these bars in practice. Fig. 6 shows a typical floor construction, as also pillars, foundations, and cantilevers constructed with indented steel bars, these being details of the typical construction of a warehouse as shown in Fig. 5. to which many large structures have been designed and erected in the United States with these bars.

Floors.

Fig. 7 shows a floor in course of construction, while Fig. 8 shows the manner in which concrete floors are economically reinforced with indented steel bars in a steel-frame construction, such as is customary in the United States for large buildings, and is now coming into general adoption in this country. The main beams, of course, in a steel-frame structure are of I section, and the indented bars are just hooked over these beams as shown in the view. It is usually considered sufficient to run these bars in one direction only, although with heavy concentrated loads bars of smaller section are placed crossing them in the opposite direction so as to prevent cracks occurring along the lines of the principal bars.

Fig. 9 also shows a job where indented bars were used for the construction of a reinforced concrete chimney stack 125ft. high.

In this same issue we publish a section showing the manner in which indented bars are used to reinforce sewers, this section being taken from an actually constructed conduit at Del Rio, Texas. In addition to the above-mentioned uses to which indented bars have been put, we may mention bridges, culverts, tunnels, canals, reservoirs, gasholder tanks, water towers, sea walls, grain bins, dams and retaining walls.

In the United States these indented bars have been most extensively used for engineering work—a fact which should be conclusive to the uninitiated that these bars possess real advantages, for the engineering profession in America is highly trained and scientific. We have not space to publish illustrations of even the most important and interesting architectural and engineering structures erected with indented bars.

FIG. 8.—SYSTEM OF FLOOR CONSTRUCTION WITH STEEL JOISTS.

THE BUILDERS' JOURNAL

AND ARCHITECTURAL ENGINEER.

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The Weird in Architecture. In view of some latter-day expressions—more especially those connected with the arts and crafts movement—it is interesting to consider the subject of weirdness in architecture; and, at the outset, it may be well to distinguish between what is "weird" and what is "mysterious." Ruskin was a noble exponent of the mystery of architecture, and, though it has now become the fashion to discredit him as a critic, we cannot forget many wonderful passages in his writings which bring vividly before us this quality of architecture. There is, however, a vast difference between "mystery," as we think of it in great cathedral building, and "weirdness," as we now contemplate it in the work of ultra-moderns. This "weirdness" is no thing to foster, but a thing to be stamped out. It is the expression of a mad type of mind, and of all qualities in architecture we do not want madness: for architecture demands restraint, and though it is legitimate to give play to all manner of quaint "fancy," there must be a ruling sense of control—the subordination of matter to mind. We are not imagining a wild flight of design, as though it did not exist. Unfortunately, we have only to turn to buildings without number now being produced by a certain type of architect on the Continent to see what amazing things are done. The Arts and Crafts movement sprang out of this country, but the several leading men who were (and still are) the life and soul of that movement here must not be saddled with the wild creations of unbalanced intellects abroad. In particular, we cite some of the German and Austrian work. We took occasion in a former issue to illustrate a few of the maddest freaks which we had then encountered—material treated absolutely without regard to fitness, and utter license taken with recognised forms, so that the effect was nothing else than ridiculous. At the same time we think it ought to be pointed out that amidst all this weirdness of design there is much that is really notable—brilliant ideas of fresh forms and new detail which are worthy of the closest attention; for, in a sense, this is the product of genius, and while we feel that in bulk the work is mad and wanton, these new and unusual features place it, to an extent, far above the stock architecture which is the sum-total of the average practitioner's ability. As such we commend it to our readers.

Havoc on the Embankment. THOUGH so late in the day, we desire to add our support to the protest which is being raised against the havoc which the new tramways are making on the Embankment. Reasonable persons must agree that the existing means for crossing the Thames are totally inadequate. The want of some good service of trams has long been felt. Some people seem to forget that the bridges were made to use, not to look at, and while we should strongly oppose any scheme of overhead tramways across them—regarding the overhead system, albeit the most economical and easy to maintain, one of the most disfiguring elements in modern town development—we recognise that a conduit system is perfectly commendable; and as there must be a connection on the north side of the river between Westminster Bridge and Blackfriars Bridge we have never objected to the proposal to lay conduit tramways along the Embankment. But when the County Council, by the iniquitous regulation of a Select Committee of the House of Commons, starts laying the track so that the inside rail is only 2ft. 6in. from the kerb (instead of the usual 9ft. 6in. stipulated by the Board of Trade) we join with the protest against it; for, even if this does not mean the cutting down of the plane trees which make the Embankment the most delightful thoroughfare in London, it must necessitate such extensive lopping of the branches that the mutilation will be a serious blemish. With the track actually in process of being laid, however, we fear that no protest will now stop this ill-starred scheme, and we can only hope that at least no double-decked cars will be run on the lines, necessitating extra lopping off of the branches, for with these big cars it is necessary to have a clear space of 16ft. 6ins. above the metals.

Trafalgar Square. SCHEMES for the improvement of Trafalgar Square have been often brought forward, but usually they never get any further than paper stage. We suppose the reason is that opinion is so much divided as to what might be called an "improvement" of this notable place. For our own part, we have always thought that turf might be introduced with advantage around the fountains, but there are many people who prefer that the present expanse of granite should not be altered. The Office of Works, therefore, has apparently thought it best to let the Square remain as it is, and to pass unnoticed the periodical criticisms of the statues. We see, however, that a scheme has now been brought forward by the Navy League which has passed the unofficial paper stage, for the Office of Works has given consent to certain alterations suggested by the League. The scheme of improvement would seem to comprise chiefly the decoration of the two large pedestals at either end of the terrace, and the fountains, the removal of the statues of George IV., Napier and Gordon to more prominent positions in the Square, the placing on the terrace wall of bronze reliefs and medallions as memorials to seventeenth and eighteenth century admirals, and the erection of a drinking fountain on the west side of the Square to balance the entrance to the "Bakerloo" tube on the east side; also to give a more architectural setting to the latter. We have not seen the exact details of the scheme—indeed we do not think they have been formulated, as the Navy League has not yet sent out its appeal for subscriptions—but, so far as we can judge from the particulars available, we see no reason why this scheme should not be carried out. We notice that the Office of Works, while giving its consent to the League's proposals, draws a hard line against any "horticultural work," which would restrict the use of the space for public meetings, &c.

PRACTICAL NOTES FOR ARCHITECTURAL DRAUGHTSMEN.

By Alfred W. S. Cross, M.A., F.R.I.B.A., and Alan E. Munby, M.A.

THE ORDERS AND THEIR APPLICATION.

Introduction.

So many scholarly works upon the Orders are in existence, that some explanation seems to be called for in introducing another series of articles upon a subject that is, to all appearances, already well worn.

Notwithstanding the consensus of opinion as to the general proportions that ought to be followed in their delineation, an opinion based upon the rules laid down by the architects of an early period of the Renaissance, a surprising divergence from the precepts and practices of these old masters of their art is to be found in many buildings of our own time.

But whilst the setting out and general proportions of the Orders should be invariable, there is no objection, provided the spirit, grace and harmony of their prototypes be not lost, to exercising a certain amount of latitude in the treatment of their details and enrichments.

Unfortunately, however, we see on all sides designs for important buildings that have been ruined by their authors' lack of scholarship or inability to appreciate the fact that a general distortion and inversion of the proportions and properties of the Orders does not and cannot result in good architecture.

The majority of books upon the subject under discussion are written for the benefit of the student and consist, in many cases, of a series of plates exemplifying the methods advocated and employed by different architects, and although the variations found in a given Order, as delineated by diverse authorities, are chiefly those of detail, yet anyone who endeavours to compile for himself useful generalizations regarding such dimensions is apt to be baffled and discouraged by what appear to him to be irreconcilable discrepancies. *All* are examples to be followed, but before *any* can be advantageously studied the knowledge of the common ground-work which has influenced each authority seems necessary.

It is, however, not so much to the student as to the draughtsman, who already possesses some general acquaintance with the Orders, that these notes are indited; he, especially in the course of his office duties, requires concise rules to enable him to properly proportion and delineate them with rapidity and precision. These rules should be unencumbered by variations of detail, as to which the individual taste of the architect ought to be the deciding factor. The need of a small book of reference of the kind indicated is particularly felt where preliminary sketch drawings or competitive designs are in question.

The writers are only aware of the existence of one book which seems to meet the usual office requirements, and that is a work entitled: "Rules for drawing the several parts of Architecture," by James Gibbs, published in 1732; a book that has never been reprinted and copies of which are not now readily obtainable. The object aimed at, and successfully attained, is an illustration and description of an example of each Order, not "after Gibbs," but representing one of a good average type of design so proportioned that the dimensions of the various parts bear simple and easily discernible ratios one to another. The main divisions of each Order are further dealt with in detail on the same principle, and finally numerous plates are given showing their application to actual buildings. The republication of this valuable book in its present form is not very probable. The letterpress is somewhat discoursive and contains a certain amount of repetition, while the drawings are, in a measure, subservient to the size of the pages, resulting in an undesirable variation of scale and rendering rapid reference difficult. An attempt has therefore been made to co-ordinate the leading features of the book by re-drawing some of the illustrations, retaining the useful dimensions shown thereon and entirely re-writing the description of the plates, with the introduction of some general principles likely to be of value to the draughtsman and student, for which purpose the opinions of standard writers, particularly those of Sir William Chambers, have been freely incorporated. The descriptions of the dimensions contained in the letterpress have been collected and arranged in tabular form to enable the draughtsman to obtain, from data easy of reference and conveniently accessible, all the essentials for correctly setting up the Orders.

Before attempting such a condensation of the material in the book it was thought desirable to ascertain how far the generalizations adopted by Gibbs really represent the proportions used by acknowledged authorities. For this purpose the average ratio of the diameter of the column to the height of the entablature, as being a relation which essentially affects the whole proportion of the Order, was obtained by measuring a number of recognised examples, and it may be of interest to give the results, as an indication of the actual value of the dimensions used.

TABLE SHOWING THE APPROXIMATE RATIO BETWEEN THE LOWER DIAMETER OF THE COLUMN AND THE HEIGHT OF THE ENTABLATURE.

Tuscan.		Doric.		Ionic.		Corinthian.	
Alberti	1 : 1·5	Alberti	1 : 2·0	Alberti	1 : 1·4 1 : 1·7	Alberti	1 : 1·8
Palladio	1 : 1·8	Palladio	1 : 1·9	Palladio	1 : 2·0	Palladio	1 : 2·0
Scamozzi	1 : 1·9	Scamozzi	1 : 2·1	Scamozzi	1 : 1·8	Scamozzi	1 : 2·0
Vignola	1 : 1·8	Vignola	1 : 2·0	Vignola	1 : 2·3	Vignola	1 : 2·5
—		Parthenon	1 : 2·0	Fortuna (Rome)	1 : 2·3	Pantheon	1 : 2·3
—		Baths, Diocletian	1 : 2·0	Baths, Diocletian	1 : 1·9	Jupiter Stator	1 : 2·5
—		Temple Pæstum	1 : 1·7	Minerva, Athens	1 : 2·3	Jupiter Tonans	1 : 2·2
—		Apollo, Delos	1 : 1·8	Illius, Athens	1 : 2·3	Temple Antoninus	1 : 2·3
St. Paul's, Covent Garden	1 : 1·8	Bow Church, Portico	1 : 1·9	Banqueting Hall	1 : 2·0	Hampton Court	1 : 2·2
Average	1 : 1·76	Average	1 : 1·93	Average	1 : 2·00	Average	1 : 2·00
Gibbs	1 : 1·75	Gibbs	1 : 2·00	Gibbs	1 : 1·82	Gibbs	1 : 2·00

The above examples have not been selected with any intention of justifying the proportions adopted by Gibbs, but are merely cited as those which readily occurred to the mind, or of which the dimensions could be easily obtained.

The result renders it evident that the general proportions of the Orders as recommended for adoption by this architect are fully worthy of confidence, if, indeed, the correctness of the architecture of his own buildings does not in itself warrant such an assumption.

The letterpress attached to the plates has been curtailed as far as possible, for although the elucidation of rules forms a fascinating study, and may even lead to the discovery of interesting and hitherto unsuspected relations between component parts of the orders, the investigation of such theories is best left to the dilettante and man of leisure. Whether, however, the value of rules for minute sub-divisions is real or imaginary, it is certain that no ordinary mind can retain more than a very limited number of them. Hence, it would obviously seem preferable to master a few main dimensions, and, having thus inculcated a general sense of proportion, to rely upon gaining familiarity with the plates by constant use, when the proportions of the smaller members of the compositions will become naturally assimilated. The Composite Order is given in Gibbs' book, but, owing to its similarity to the Corinthian and to the absence of a consensus of opinion as to its dimensions, it has not been included in the present work. The addition, however, of this Order to the scheme would not form a very serious undertaking should it be desired for any individual purpose.

No enrichments have been shown on any of the Orders to avoid distracting attention from the dimensions. With the exception of the whole of the Tuscan Order and of the frieze of the Ionic Order there are few members, apart from mere fillets, which have not been enriched, by some form of ornament, in one or another example, the Doric naturally the least and the Corinthian the most. In the latter Order, in fact, even the cyma and corona of the cornice, in addition to the frieze, ogees and beads, are often ornamented, but, apart from the question of expense, it is undesirable to carry such elaboration too far, as when placed in close contact with each other, especially when a distant view is alone possible, one moulding will often rob another of its effect, and, indeed, the value of richness of detail is more often than not lost in this manner.

The enrichment of columns beyond ordinary flutings is generally to be deprecated, while the application of ornament to bases and pedestals is seldom either requisite or desirable.

However great may be the utility of drawings dealing with the Orders, it should never be forgotten that they are merely a means to an end, that end being an executed building. Those whose work is confined to a drawing board develop a strong tendency to consider their compositions solely from an elevational and artistic draughtsman's point of view, and every opportunity should be taken of checking this habit and of cultivating the art of thinking "in the round." The study of perspective of buildings, and, best of all, the preparation of models of portions of a proposed building, an occupation which often results in the discovery of latent defects of design, are alike of the greatest educational value to the student of architecture.

"Practical Notes for Architectural Draughtsmen: The Orders and their Application."

Tabulated Dimensions of the Orders. Arranged Progressively as Required for Use.

	Dimension required.	Tuscan.	Doric.	Ionic.	Corinthian.	Dimension = 1.
	No Pedestal Height of Entablature	$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{6}$	$\frac{1}{6}$	Total height of Order.
	With Pedestal Height of Pedestal	$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{5}$	” ” ”
	Height of Entablature	$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{6}$	$\frac{1}{6}$	Height of Order less Pedestal.
	THE COLUMN.					
Vertical.	Diameter of Shaft	$\frac{1}{7}$	$\frac{1}{8}$	$\frac{1}{9}$	$\frac{1}{10}$	Height of Order less Entablature and Pedestal.
	Height of Base	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	Diameter of Shaft.
	” Base Plinth	$\frac{1}{2}$	$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$	Height of Base.
	” Lower Torus	$\frac{3}{4}$	$\frac{3}{8}$	$\frac{3}{9}$	$\frac{3}{10}$	” ” less Plinth.
	” Upper Torus	—	$\frac{5}{6}$	$\frac{5}{6}$	$\frac{5}{6}$	” lower Torus.
	” Upper Torus and fillet under	—	1	1	1	” ” ”
	” Capital	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{7}{6}$	Diameter of Shaft.
	” Necking	$\frac{1}{3}$	$\frac{1}{3}$	To eye $\frac{1}{3}$	To 1st leaf about $\frac{1}{3}$	Height of Capital (Corinthian less Abacus).
	” Top of Neck to top of Ovolo	$\frac{1}{3}$	$\frac{1}{3}$	Eye to abacus $\frac{1}{3}$	To 2nd leaf about $\frac{1}{3}$	” ” ” ” ”
	” Abacus	$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$	2nd leaf to abacus about $\frac{1}{3}$	” ” ” ” ”
	” Astragal and fillet	$\frac{1}{6}$	$\frac{1}{6}$	—	$\frac{1}{6}$	Semi-diameter of Shaft.
	” Fillet below Astragal	$\frac{1}{3}$	$\frac{1}{3}$	—	$\frac{1}{3}$	Height of Astragal and Fillet.
Horizontal.	Projection of Base beyond Diameter	$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$	Semi-diameter of Shaft.
	” Upper Torus	—	$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{5}$	” ”
	Diminution of Shaft at Top	$\frac{1}{5}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	” ”
	Projection of Cap over Shaft at Top	$\frac{1}{2}$	$\frac{1}{2}$	—	—	Semi-diameter of Shaft at Top.
	” Cap over Shaft at Base	—	—	$\frac{1}{2}$	$\frac{1}{2}$	Semi-diameter of Shaft.
	” Bead at top of Shaft	$\frac{1}{6}$	$\frac{1}{6}$	—	$\frac{1}{6}$	” ”
	THE ENTABLATURE.					
Vertical.	Height of Architrave	$\frac{2}{7}$	$\frac{2}{8}$	$\frac{3}{10}$	$\frac{3}{10}$	Height of Entablature.
	” Frieze	$\frac{2}{7}$	$\frac{3}{8}$	$\frac{3}{10}$	$\frac{3}{10}$	” ”
	” Cornice	$\frac{3}{7}$	$\frac{3}{8}$	$\frac{4}{10}$	$\frac{4}{10}$	” ”
	” Fillet and Cyma	$\frac{1}{3}$	$\frac{2}{9}$	Both fillets $\frac{1}{4}$	Both fillets $\frac{1}{5}$	” Cornice.
	” Corona and Fillet over	$\frac{1}{3}$	$\frac{2}{9}$	$\frac{1}{4}$	$\frac{1}{5}$	” ”
	” Base of Corona to top of Ovolo	—	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{5}$	” ”
	” Top of Ovolo to Frieze	$\frac{1}{3}$	$\frac{2}{7}$	$\frac{1}{4}$	$\frac{1}{5}$	” ”
Horizontal.	Total projection of Architrave over top diam. of Shaft	$\frac{1}{7}$	$\frac{1}{6}$	$\frac{1}{4}$	$\frac{1}{5}$	” Architrave.
	” top face of Architrave ” ”	$\frac{1}{3}$	$\frac{2}{3}$ (guttae)	$\frac{1}{3}$	$\frac{2}{5}$	Total projection of Architrave.
	” of Cornice over Frieze	1	$\frac{4}{3}$	1	1	Height of Cornice.
	” Inset of Corona from top of Cornice	1	$\frac{5}{6}$	1	1	” Fillet and Cyma of Cornice.
	” Length of Modillions (or Mutules)	—	$\frac{1}{2}$	$\frac{1}{4}$	(and ogee) $\frac{1}{3}$	Diameter of Column.
	$\frac{1}{12}$ Breadth of Modillions (or Dentils)	—	(triglyph) $\frac{1}{2}$	M. $\frac{1}{6}$ D. $\frac{1}{12}$	$\frac{1}{6}$	” ”
	$\frac{1}{24}$ Space between Modillions (or Dentils)	—	(metope) $\frac{3}{4}$	M. $\frac{1}{3}$ D. $\frac{1}{24}$	—	” ”
	THE PEDESTAL.					
Vertical.	Height of Plinth	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	Height of Pedestal.
	” Base	$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$	” Plinth.
	” Cyma of Base	$\frac{2}{3}$	$\frac{1}{2}$	$\frac{1}{2}$	(and fillet) $\frac{1}{2}$	” Base.
	” Fillet below Cyma	1	1	1	1	Fillet above Cyma.
	” Cap	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	Height of Plinth.
	” Base of Corona to top of Cap	$\frac{2}{3}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	” Cap.
Horizontal.	Projection of Cap and Plinth over Die	1	1	1	1	” Base of Pedestal.
	” Corona of Cap over Die	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	Projection of Cap over Die.

Note.—The "Diameter" is always the greatest diameter of the drum of the Column. M. refers to the Modillion Cornice. D. to the alternative Dentil Cornice.

The Setting up of an Order.

(To be studied in connection with Plates I., II., and III.)

The sequence followed in setting up an Order will be found to influence, to some extent, the rapidity and facility with which it can be accomplished. An outline of the method of procedure may, therefore, prove useful.

Usually the height of the Order is fixed by circumstances, as, for example, when it is to be applied to a given storey of a building.

The total height having been settled, draw the limiting horizontal lines and then set out the vertical centre lines of the columns, thus dividing the frontage to be treated into bays appropriate to the exigencies of the design and having due regard to the correct intercolumniation of the Order adopted. If a pedestal is to be placed under the column, cut off one-fifth of the total height for it, and cut off one-fifth or one-sixth of the remainder (measured from the top limiting horizontal line) for the vertical height of the entablature; the intervening space gives the height of the column, including its cap and base. If no pedestal is to be used, divide the whole of the given height into five or six parts, cut off one of these parts, from the top, for the entablature, and the remainder gives the height of the column.

The Column. Since some of the dimensions of the entablature are in terms of the diameter of the column, the latter should be next developed. The term "diameter of the column" refers always to its greatest diameter—namely, that of the shaft just above the lower cincture. This dimension is one-seventh to one-tenth of the height between the soffit of the entablature and the top of the pedestal, or lower limit of the Order in the absence of a pedestal. If the centre lines of the piers do not represent the centres of the columns, as, for instance, when coupled columns are used, the centre line of one of the columns must now be decided upon and the diameter of the Order symmetrically disposed horizontally across it. A semi-diameter is then cut off, from the bottom of the column, for the height of the base, and it should be noticed that this—except in the Tuscan and alternative Doric Orders—does not include the fillet at the base of the shaft, the members above the upper torus being reckoned as part of the shaft, as are also the astragal and fillet below the necking of the capital of the column. The plinth and lower torus of the base project one-third and the upper torus one-fifth of a semi-diameter beyond the lower circumference of the shaft. The leading lines for the base having thus been obtained, cut off by a horizontal line the height of the capital from the top of the column, and (except in the Ionic Order) again below it, a height equal to one-sixth of a semi-diameter for the astragal and fillet below the necking.

The semi-diameter of the shaft at one-third of its height from the bottom is then divided into five or six parts, and four or five of these parts are taken as a semi-diameter at the top, below the astragal. The shaft may now be completed, the entasis being usually made to start from the greater diameter, one-third up the shaft, below which point it is a true cylinder until the cincture at the base is reached. This is the best method to adopt in the case of small scale drawings. Where large detailed drawings are in question the diameter may be alternatively divided at the base of the shaft instead of at one-third of its height, and the entasis extended throughout the whole length. The completion of the shaft enables the projection of the capital to be marked off, and also that of the astragal and fillet, which is equal to their combined height.

The Entablature. The development of the entablature can now be proceeded with, the architrave, freize and cornice being ruled off horizontally and the members of each inserted (see dimensions). The projections for a returned end or section are obtained from the upper diameter of the shaft. The lowest member of the architrave, and also the freize, lie vertically over the circumference of this upper end of the shaft. The projection of the cornice beyond the freize line is equal to its height, except in the Doric Order, in which the projection is one-third more than its height of one diameter. Further rules dealing with minor projections and the position of the modillions, dentils, &c., will be supplied by a study of the plates and tabulated dimensions.

Pedestal. Finally, the pedestal, if any, should be divided vertically into four parts; the lower part is ruled off for the height of the plinth, one-third of the second part for the height of the base, and one-half of the top part for that of the cap. The projection of the die is equal to that of the base of the column, and the plinth and the cap of the pedestal extend beyond this for a distance equal to the height of the base of the pedestal previously obtained.

The above dimensions will all be found in the subjoined table, which represents an endeavour to bring together, in a form suitable for reference, sufficient information to make any glaring disproportion impossible.

A few of the minor divisions are only approximations; they will, however, be found to be sufficiently accurate for any but large detail drawings, in which it is not desirable to destroy all individuality by rigorous mechanical rules.

On the left hand will be found the dimension required and, in the intermediate column the fraction for each Order of the previously ascertained unit given in the right-hand column.*

Plate I.

Plate 1 represents the four Orders drawn to a common vertical height.

The pedestal may or may not be required and, if used, it is to be regarded as an addition to the Order, the relative dimensions of the parts of which are not altered by its removal or introduction.

The diameter of the column (by which is meant the diameter of the shaft above its lower cincture) is the ruling dimension from which most of the others are obtained, and the smaller circumference of the top of the shaft always coincides with the frieze line from which all the projections of the entablature are set out.

In judging the value of such projections it should be borne in mind that in execution the higher vertical faces of the composition will usually be much foreshortened to the observer and that there will be a consequent increase in the comparative value of neighbouring projections.

A perusal of the table will indicate those dimensions which all the Orders have in

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*A large number of these dimensions appear again and again upon the plates, but to avoid confusing the drawings all are not shown, and some dimensions will be found thereon which do not lend themselves to insertion in the tabular statement.

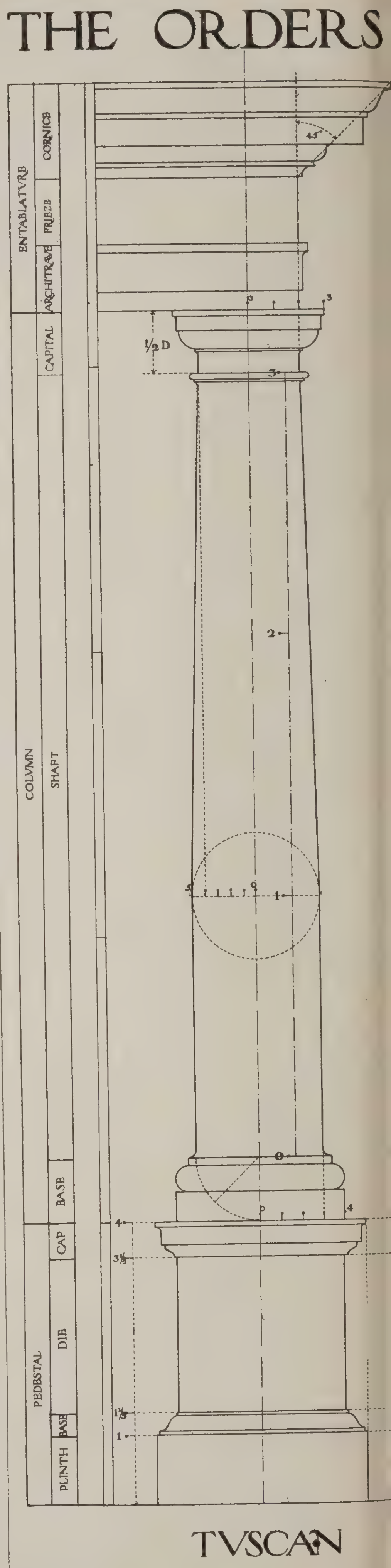
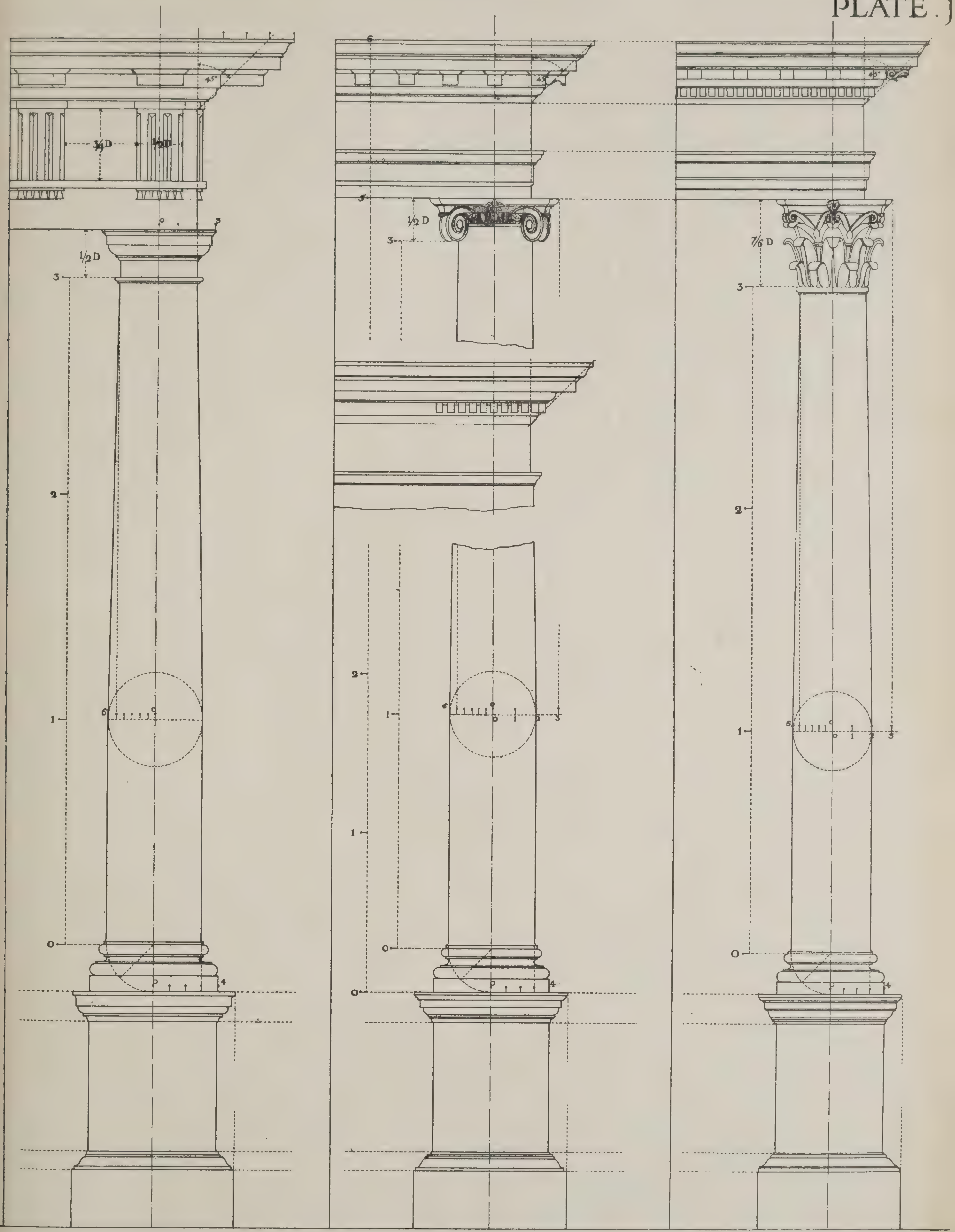


PLATE . I



DORIC IONIC CORINTHIAN

THE ORDERS AND THEIR APPLICATION. BY ALFRED W. S. CROSS, M.A., F.R.I.B.A., AND ALAN E. MUNBY, M.A.

common, but for convenience of reference they are further summarised thus:—

Height of Pedestal, $\frac{1}{5}$ total height of Order.
Height of Plinth, $\frac{1}{4}$ height of Pedestal.
Height of Pedestal Base, $\frac{1}{3}$ height of Pedestal Plinth.
Height of Pedestal Cap, $\frac{1}{2}$ height of Pedestal Plinth.
Projection of Cap and Plinth, $\frac{1}{3}$ height of Pedestal Plinth.
Projection of Corona over Die, $\frac{3}{4}$ projection of Pedestal Cap.
Height of Column Base, $\frac{1}{2}$ Diameter of Column.
Projection of Base over Shaft, $\frac{1}{3}$ Semi-diameter of Column.

Pilasters. The general proportions allotted to the columns of the Orders apply also to pilasters, which may be regarded as columns square on plan, but almost universally deeply engaged. The projection of pilasters must be regulated by circumstances. If impost mouldings or other projections stop upon them, as on the inner wall of an arcade, these projections must be sufficient to take the mouldings, and if they line with engaged columns crowned by an entablature, they must have a projection similar to the columns, and therefore in such cases never less than a semi-diameter. Apart from these considerations, the projection should be about one-fourth of the diameter. Pilasters may be fluted or plain; if the former, the flutes should be, as far as possible, the same size as those of the adjoining columns, and always an odd number.*

On plain faces 7 flutes (occasionally 9) are used, and therefore in the above case 4 flutes (or 5) would be employed on each side of the re-entering angle. The returned sides of pilasters should never be fluted unless the projection is as much as half of a diameter. The diameter assigned to a pilaster will be that of a column (if any) used in conjunction with it. The shaft may or may not be diminished.

If the pilaster stand alone it is best formed with the same top and bottom diameter, but if a column stand in front of it then it should be diminished to the same extent as the column. Entasis is not usually given to pilasters.

Unless columns and pilasters are monoliths the shafts should be built up of three drums and not two, as a central joint, unless exceptionally well executed, has a very disagreeable appearance.

(To be continued.)

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* In the case of a pilaster returning on the internal angle of a building, half of a flute may be added to each side of the half pilaster to give greater breadth, and thus avoid too much mutilation of the capital.

Our Plates

How Green, Hever, Kent.

This house has been erected for M. V. Charrington, Esq., on the high ground to the north of Hever Church and overlooking the valley of the Eden. It has been planned to get as much sun as possible. The walls are faced with bricks from Crowborough; the tiles for the vertical tiling come from Dunton Green, and those for the roofing from Ashford. The window frames are of oak with leaded lights and iron opening casements. The contractors were Messrs. Mussellwhite & Sapp, of Basingstoke. Mr. W. F. Milne acted as clerk of works. The architect was Mr. R. Weir Schultz, of 14, Gray's Inn Square, W.C.

New Premises of Messrs. Spalding & Hodge, Ltd., the well-known paper firm, have been erected in Drury Lane from designs by Messrs. Harrison & Ward.

Kirkintilloch's New Town Hall, just completed, has cost £9,000. The architects were Messrs. Walker & Ramsay, of Glasgow, whose design was selected in competition.

Correspondence.

Cleveleys Cottage Exhibition.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—I was interested to see in your last issue the illustrated article on the exhibition of cottages at Cleveleys. The jerry-built stock-moulded hat-box-on-the-side-of-a-railway embankment type of house has been perpetrated a few times at Cleveleys, but, barring these, the cottages are well worth a visit, as they reflect credit on architect and builder. Some have original little tricks of construction or ornament besides good internal arrangements, and these are worth noting for future reference. Many houses, though, are spoilt by want of thought in their planning, appearance being the first consideration instead of comfort. In one case an outside door opens inwards in such a way that it necessitates ushering the guest into the living room while the outer door is being closed; then by dodging round an ante the friend reaches the hall. Many cottage bedrooms could only permit of a bed 3ft. wide being placed in its proper position, and this mistake in nearly every case occurs in the principal bedroom. Fireplaces in sitting-rooms are frequently so placed that no one could sit near them in comfort. Staircases were evidently stumbling blocks to many planners—few are a success. Some are ideal dust-traps, with handrails fixed at heights varying between 2ft. and 4ft.—some could not be grasped by an adult, let alone a child, while others the small boy would break off. First-floor landings are in numerous cases cut down to a minimum, so that no furniture could be cajoled into a bedroom unless through the window, and, even in that case, the opening is so artistically small that no wardrobe could be pulled through it without taking off the gable-end of the house. One bungalow has a servant's bedroom in the roof reached by means of a cat-ladder from the scullery, and as the roof has a fair span this valuable space is useless as a sleeping apartment. Doubtless other architects could add a few other notes to the list of novelties.—Yours truly,

W. EDWARDES SPROAT.

Liverpool.

A Circulating Technical Library.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—With reference to the leader on the above in your issue for September 12th, you may be interested to know that at the commencement of the present session this Society reorganised its small collection of books, added considerably thereto, and formed a circulating technical library, with the idea that its many members and students in the provinces who are unable to obtain the books so easily as London members may have the volumes forwarded to them through the post.

This new development has been very successful, and within a few months between two and three hundred volumes have been circulated. Large and unwieldy, or specially valuable, books are of course restricted to the reference library.

I have no doubt other architectural societies afford their members similar advantages, and my object in writing to you is to support your view that there is scope for a circulating technical library.—Yours truly,

C. McARTHUR BUTLER,
Secretary, Society of Architects.

LONDON.

NORTHERN POLYTECHNIC.

The prospectus for the forthcoming session at the Northern Polytechnic, Holloway, has just been issued. The Architectural and Building Department is now organised in four sections—namely, the architectural and building day school, the building day trade school, manual training courses, and evening classes. The architectural and building day school for young architects, builders and surveyors is provided with a third-year course of day study to be taken by pupils if desired. A new special two-years' evening continuation course for advanced students is also provided as an alternative to the third-year day course. The second-year course is in part differentiated so that pupils who intend to become builders or estate surveyors may have opportunities of taking special classes in correspondence and book-keeping, and in office routine and business methods.

The Day Trade School

is an entirely new departure, and has been established as the result of a conference of building employers and others held at the Polytechnic last winter. The aim and object of this school, which is the first to be established in special connection with the building trades in England, is to partially replace the apprenticeship system. In view of the practical disappearance of this system in London, and the difficulty experienced by parents and guardians in obtaining for boys a training in the skilled trades, the Northern Polytechnic now undertakes such practical training, and for the purposes of this school new building extensions are contemplated.

In the evening classes the courses on "Theory of Structures and Structural Engineering" and the special course of lectures on "Modern Building Practice" are this year incorporated in the course for Honours Building Construction, although either may still be taken independently. The "Mould-Cutting Class" is designed to meet an urgent need in the study of masonry, and new electrically-driven machinery for stone-rubbing, lathe-turning, &c., has been placed in the masonry workshops. The Building Students' Association (secretary, Mr. A. J. Thomas, 124, Englefield Road, N.) yearly arranges a series of visits to buildings and works.

Another feature to be introduced this year, not mentioned in the syllabus, is the improved system under which building construction will be taught. Hitherto the almost universal method of instruction in this subject has consisted of lectures on a comprehensive series of building details, followed by production of drawings of detached items of construction. In spite of the teachers' best efforts the drawings too often remain mere abstractions to the student, while his ideas of building construction are diffuse and incomplete. Under the new system the study of details will be co-related, leading up to a single but complete design of a building. Large scale take-to-pieces models of complete buildings have been provided for this purpose, and the advantage which the student will obtain through seeing and drawing the actual details as added, and when co-related, to the other details in the actual production of the complete building will be a factor of great importance.

The head of the architectural and building trades department is Mr. Hugh Davies, F.G.S.

LIBRARY
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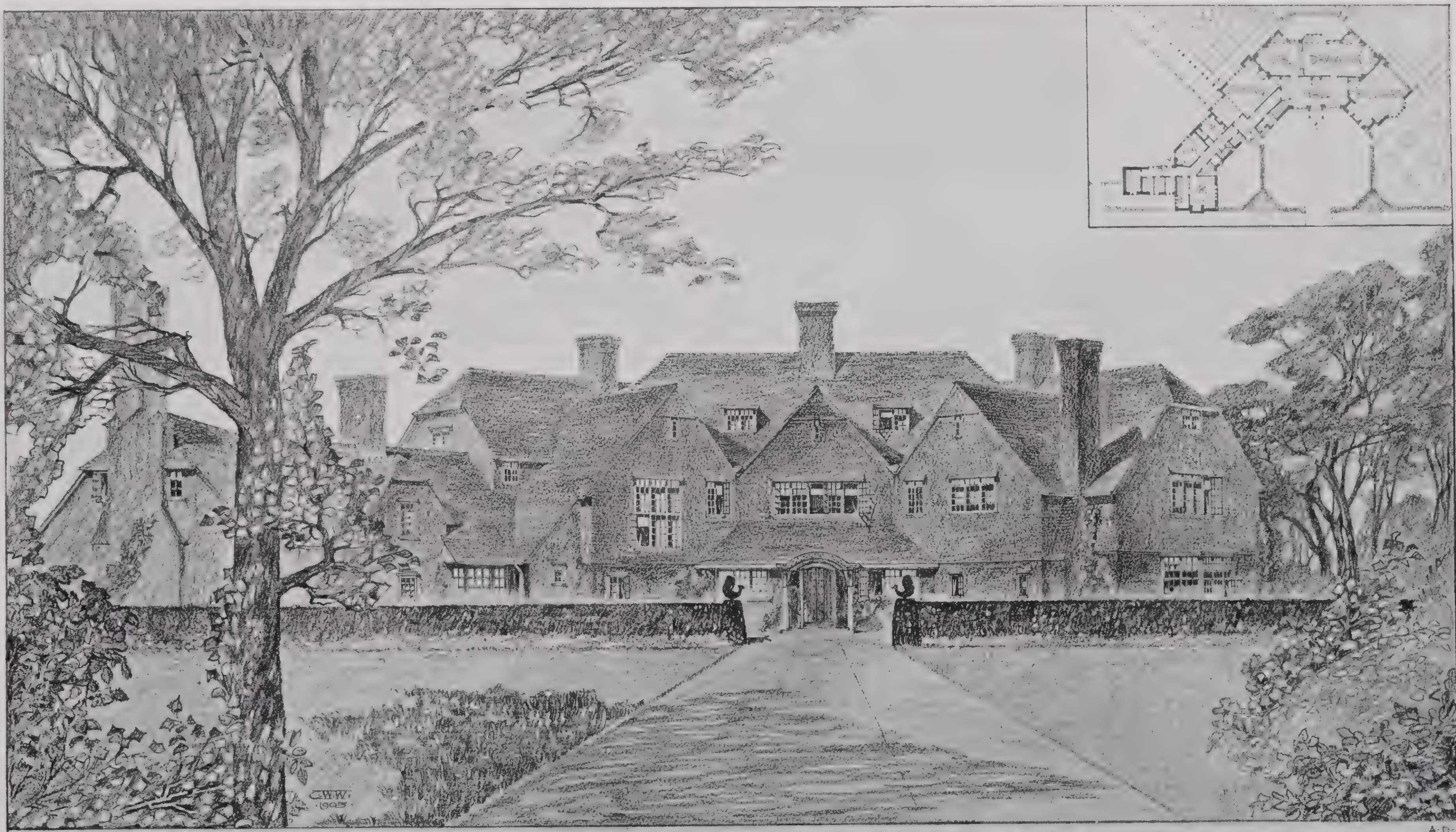
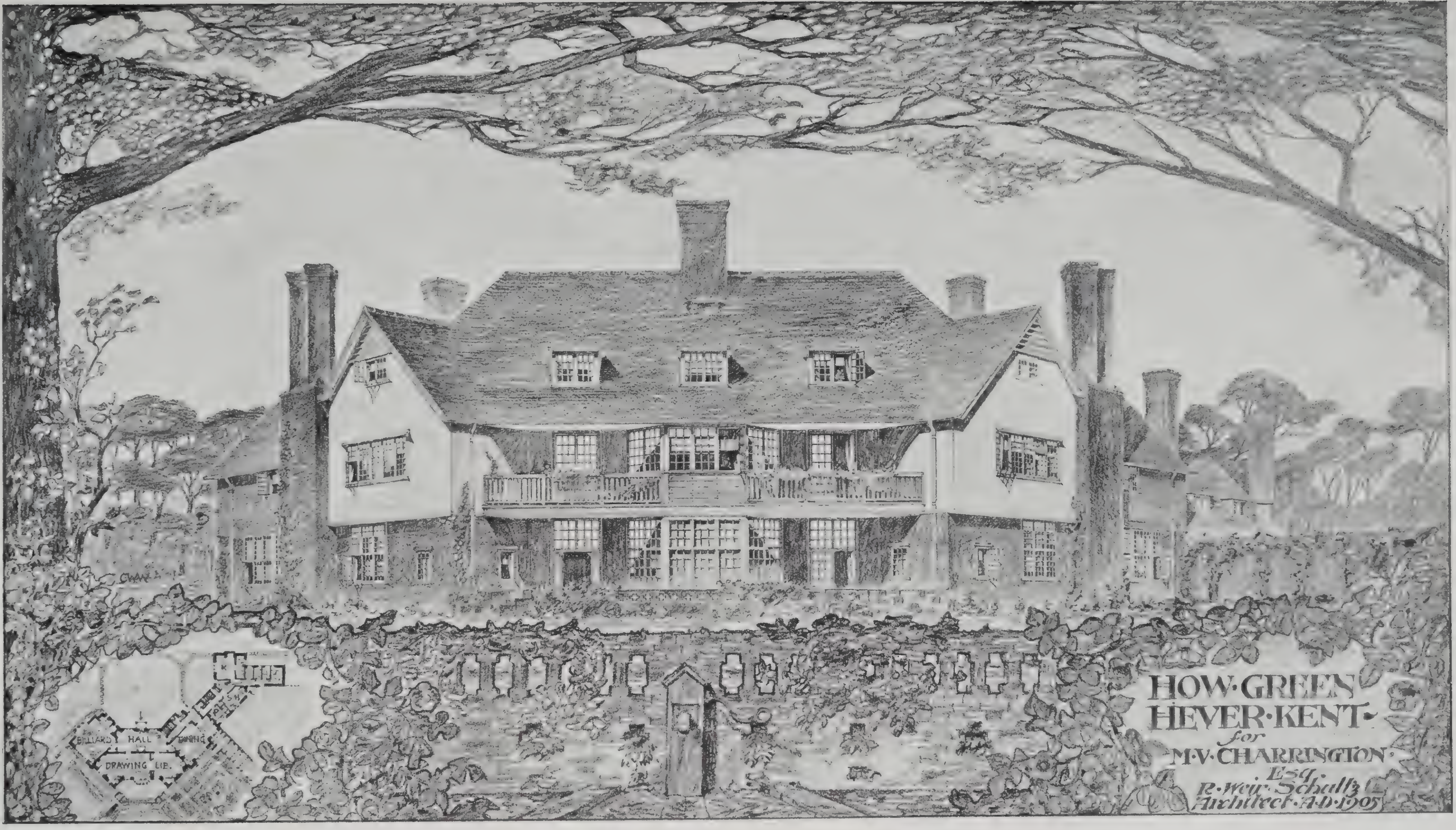
UNIVERSITY OF ILLINOIS

Supplement to
The Builders' Journal and Architectural Engineer,
Wednesday, September 19th, 1906.



HOW · GREEN : HEVER : KENT : *for* M · V · CHARRINGTON ESQ : R. WEIR · SCHULTZ : ARCHITECT : A.D. 1905


HOW·GREEN
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Notes on Competitions

List of Competitions Open.

DATE OF DELIVERY	COMPETITION.
Sept. 20	SCHOOL AT SUNDERLAND. Limited to local architects. Premiums of £5o, £20 and £10. Particulars from John W. Moncur, Borough Engineer, Town Hall, Sunderland.
Sept. 21	CONVALESCENT & NURSES' HOME AT GLOSSOP. Premiums of £20 & £10. Particulars from Mr. T. W. Ellison, Town Clerk, Norfolk Chambers, Glossop.
Sept. 22	SEWERAGE SCHEME FOR NEWCASTLE, Co. DOWN. Terms, references, experience, by this date, to Daniel Curran, Town Clerk.
Sept. 24	SCHEME TO UTILISE EXHAUST STEAM AT LAMBETH WORKHOUSE. Particulars from George E. Arnold, C.E., 195, Kennington Road, S.E.
Sept. 28	COTTAGE HOMES AT CLEADON and receiving house at workhouse, for Guardians of South Shields Union. Particulars from J. W. Coulson, Union Offices, South Shields.
Sept. 28	SEWAGE DISPOSAL SCHEME FOR ELLESMERE. Premium of £20. Particulars from R. E. Lloyd, clerk to Urban District Council, Ellesmere.
Sept. 29	REBUILDING OF HENSHAW'S BLIND ASYLUM AT MANCHESTER. Limited to Manchester architects. Premiums £100, £50 and £25. Assessor, Mr. John Holden, F.R.I.B.A.
Sept. (last week	PREMISES AT LEVEN, for Reform Co-operative Society, Ltd. Particulars from D. C. Wilson, secretary.
Oct. 1	ALPHABET COMPETITION. Prizes of £20, £10 and £5. For particulars see "Architectural Review."
Oct. 20	SEWERAGE SCHEME FOR HIGHBRIDGE, Somerset. Premium £20. Particulars from W. C. Shier, Surveyor to the U.D.C., Highbridge.
Oct. 22	SCHOOL AT GAYWOOD, King's Lynn. Particulars from Secretary, County Education Office, 57, London Street, Norwich.
Oct. 31	BOURSE AT CAIRO.—Premiums of £E250 and £E100. International competition. Designs to be submitted to the "Corporation des Agents de Change," Cairo, Egypt.
Dec. 14	FOUNDLING HOSPITAL, MONTEVIDEO.—Four selected designs in preliminary competition to be awarded £212 each; first premium of £742 in final competition. Particulars from Consulate-General for Uruguay, 5 & 6, Clement's Inn, London, W.C.
No date	LIBRARY AT FRIBOURG, Switzerland (International competition.) Particulars from "La Direction des Travaux Publics," Fribourg.

Competitions under the Tarsney Act.

At the International Congress of Architects held in London in July it will be remembered that the subject of international competitions was discussed. Some reference to the Tarsney Act was made by an American delegate. This is an important Act, and the following precise particulars of it may be serviceable. The Act became law in February, 1903. It authorises the Secretary of the Treasury to obtain, by competition, designs for Government buildings to be erected under the supervision of the Treasury Department, provided that not fewer than five architects are invited to compete, and that the general supervision of the work continues in the office of the Supervising Architect. The regulations for the conduct of competitions under the Act stipulate (1) that the selection shall be made by a jury of four architects of established reputation and the Supervising Architect; (2) that the successful competitor shall be paid 5 per cent. on work up to £100,000, 3½ per cent. on the next £100,000, and 2½ per cent. on any amount over £200,000; (3) that of this commission the architect shall be paid $\frac{1}{5}$th when preliminary drawings are completed, $\frac{3}{10}$ths when working drawings are made, and a percentage monthly on the basis of work done; (4) that the architect shall provide one set of tracings of all drawings, the Department to take prints from them; and (5) that the right is reserved by the Secretary to dismiss the architect or revoke his commission if found incompetent, equitable compensation being allowed for work done. The regulations have been modified from time to time, an important case being that of the New York Custom House (Cass Gilbert, 1899), when the architect's commission for work over £100,000 was fixed at 5 per cent. on the total cost. Twenty-two competitions have been instituted by the United States Government under this Act, and it is satisfactory to know that in every case the profession has felt the award to have been unbiassed, and in favour of the best design submitted.

Enquiries Answered.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional, or legal matters.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Smoky Chimney.

GATESHEAD.—J. R. H. writes: "I have an outshot kitchen with range; chimney about 30ft. high, and a patent pot fixed on top. In a north-west or south-west wind of any force the chimney smokes. The chimney is surrounded by buildings on west and north at a distance of about 30 yards. The north side is open. Can you suggest a remedy?"

The situation in which the chimney is placed is a troublesome one, but we think that by the use of a good chimney-pot (there are several on the market that it would be invidious to mention), which practically prevents any possibility of down draught, and the securing of an unrestricted flue and a plentiful supply of air in a room so as to give a sufficient quantity to cause a quick draught, the trouble may be remedied. We advise you to consult one of the several specialists who advertise pots with a record of efficiency.

Land Surveying.

ENFIELD.—THEO writes: "Are there any examinations or degrees in land surveying? The Surveyors' Institution is not exactly to my requirements, as land surveying proper only occupies a minor position in its syllabus. Also, which are the best schools of training for same."

The Surveyors' Institution examination grants the only degree so far as we are aware. We could suggest several polytechnics, but probably the City of London College, White Street, Moorfields, E.C., will serve your purpose.

Architect's Department, H.M. Office of Works

GLASGOW—K. writes:—"From whom can I get particulars of the architectural department of H.M. Office of Works?"

Write to the Secretary, H.M. Office of Works, Storey's Gate, Westminster.

Property Adjoining Churchyard.

DORSET writes:—"A friend of mine has some property adjoining a churchyard and within 10ft. of graves recently made there. He is anxious to repair his property but dreads the probability of the sanitary authority stepping in and condemning it. The houses are now rather dilapidated, and he does not want to call the attention of the sanitary authority to them by any action of his. Has the law any power over the property by reason of its proximity to a burial ground?"

The sanitary authority cannot interfere under such conditions.

Books for Architect and Surveyor.

LINCOLNSHIRE.—M. F. G. writes: "I am a young student in the architectural surveyorship, and should like to know the complete list of books required in these two professions."

Apply to the secretary of the Surveyors' Institution for a copy of the syllabus of subjects and examples of papers set at examinations, price 1s. 6d.

Definition of an Ambulatory.

PORTSMOUTH.—R. J. J. writes: "Would it be correct to call the passage through the length of the clearstory wall of a cathedral giving access to the windows an ambulatory?"

Yes. The word ambulatory means a passage anywhere in a building.

Architectural Assistants Abroad.

GLASGOW.—CLYDE writes: "Please give information about the prospects of architectural assistants abroad—say, in the United States or Canada. I noticed in your paper a few months ago that there were good demands in Canada (although the High Commissioner for Canada says they are not encouraged, there being no difficulty on the spot to fill any vacancies that occur). I have also heard there are plenty of opportunities in Hong-Kong and Shanghai, but have no definite information, and they are both far away to go on the off chance."

In our opinion Canada offers the best field in the rapidly-growing towns in the North-West provinces. The United States also offers opportunities to the efficient draughtsman, but we would not advise correspondents to seek employment in India, the Far East, Australia, and South Africa.

The R.I.B.A. Kalendar.

LONDON.—L.M.B. writes: "Where can I get the Kalendar of the Royal Institute of British Architects?"

From the Institute offices, 9, Conduit Street, London, W.; price 2s. 6d.

ARCHITECTURAL ASSOCIATION.

The curriculum of the Architectural Association School of Architecture has just been issued. The next term commences on October 1st. The syllabus of the Discussion Section for the forthcoming session is as follows:—

Oct. 17—Motor Garages, by M. G. Pechell.
,, 31—Quantities and Cost, by G. M. Nicholson.
Nov. 22—Do Architects Justify their Existence? by H. G. Ibberson.
Dec. 3—Factory Design, by Adam Hunter.
,, 19—The Responsibilities of Style, by L. Stanley Crosbie.
Jan. 9—Wallpapers, by N. D. Sheffield.
,, 23—Water-Supply, by H. Rofe.
Feb. 6—Architecture and the Public, by T. L. Dale.
,, 20—Colour Decoration, by H. C. Corlette.
Mar. 6—Sewage Disposal, by F. J. Osborne Smith.
,, 20—Fences and Gates, by W. L. Trant Brown.
Apl. 17—Pavements and Responsibilities of Architects, by A. O. Collard.

Obituary.

Mr. William Pogson, architect, of Carlisle, died last week, age 60.

AIGBURTH VALE GIRLS' SECONDARY SCHOOL COMPETITION.

Only members of the profession in actual practice in Lancashire and Cheshire were allowed to compete for the above building. About 40 designs were received, chiefly from Liverpool and Manchester architects. The assessor appointed by the Education Committee was Mr. Frank G. Briggs, F.R.I.B.A., and his awards have yet to be confirmed by the Council. The designs have been on view at the Central Municipal Technical School, Liverpool, during the past week for the inspection of competitors only. From a careful examination of the principal designs, it has evidently been a very keen contest. Many of the architects within the area of the competition are known to be thoroughly conversant with school-planning, and in a few cases two complete schemes have been submitted by leading firms. The chief problem was the planning of a suitable building to fit the awkward shaped site, and yet to conform with certain restrictions on the position of the school and the entrances thereto, with a correct aspect to ensure sunlight entering each classroom during some of the teaching hours. The former difficulties have been too carefully borne in mind by the majority of the competitors to the exclusion of more important points which apply to school-planning. Many schemes were sacrificed to these local requirements which the Education Committee suggested in the conditions of the competition. In this instance the architects who nominally departed from what is considered the natural interpretation of part of the conditions and struck out on an original position (on Mosley Hill Drive) for the school buildings have been placed first. All competitors had to plan the buildings for a limited area, and the successful design is cleverly adapted to work in with the angles of the adjoining roads and fulfils the conditions by keeping within the suggested boundary lines. All the other schemes showed the school in the centre of the site, or on the boundary facing Aigburth Vale. The conditions with the sun aspect and the position of entrances led nearly all the competitors to follow on this arrangement in their block plans. Cloak-room accommodation had to be provided for 100 juniors and 300 seniors. Many plans had their balance upset by adhering to this division. All the premiated designs wisely compromised the accommodation to 200 for each cloak-room.

The result of the competition is highly satisfactory to all concerned. The assessor has had some difficulty in separating from about a dozen carefully planned schemes the three premiated designs. There may be differences of opinion with reference to the entrances and position of the buildings, but the assessor has been fully justified in his selection, as the successful plans in their arrangement are better adapted for a secondary school on this particular site than any other scheme submitted.

Design Placed First.

This has been submitted by Messrs. Grayson & Ould, of Liverpool. (First premium £50.) One of the principal features of this design is the self-balanced plan, coupled to an agreeable elevation which presents a good appearance to every road, particularly to Aigburth Vale and Mosley Hill Drive — a point which many have overlooked, but none the less important, owing to the site being an open one and situated in a better-class suburb. The main entrance is only a few feet from Mosley Hill Drive, and the conditions stated that Aigburth Vale was preferred for entrances. Judging from the block plan, in the laying out of the playfields, &c., some detached plots of grass and pathways break up the playground space, and the east front in particular. A portion of the playing field is not directly under supervision, owing to the south projecting wing. The buildings are shown on the level portion of the site. The scheme of placing the central hall, class-rooms and administrative-rooms in the main block and all the subsidiary buildings, which might be objectionable for sanitary reasons, or for considerations of noise, in detached wings, were also important points which influenced the assessor in the favour of this design. In a few minor details the plans may need revising to meet the requirements of the Education Committee. The main staircases have rather many circular steps on the ground floor and the corridors in the wings could be wider, as there will be much traffic on them at intervals in going to and from the lavatories, cloaks, bicycles, &c. As the sixth-form room and library are combined in one room, it should be placed nearer the head-mistress's room. All the first-floor galleries round the central hall should be wider, as this floor accommodates about 200 scholars. The store-room and cooking stores could be added to the crush corridor with advantage. Objection may be taken by non-competitors to the cookery room being entered off the gallery on the first floor, but the conditions were not clear on the point and suggested that this room might be used for various purposes and only occasionally for cookery lessons. The two practice rooms provided can only be entered off the music-room. In the side wings, at a lower level and over the cloaks, are the laboratory, music and practice rooms, dining hall and kitchen offices—the latter having north aspect. The elevations are simple in character, suitable to the purposes of the building. Stone quoin pilasters sparingly used add interest to the various gables.

Design Placed Second.

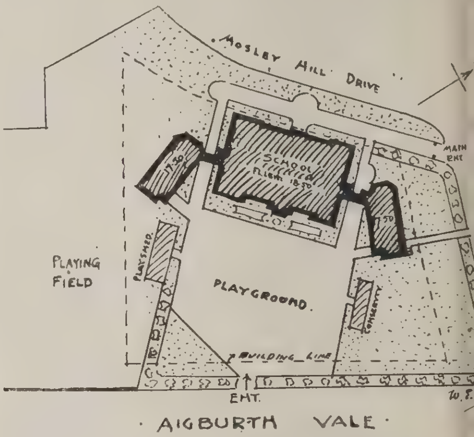
The second premium (£30) is awarded to Messrs. Appleyard & Quiggin, of Liverpool. Their plan is most compact, and in many respects is similar to the accepted design, with the side wings at the back, so that they do not intercept the sunlight at certain hours. Three of the class-rooms have a north aspect, and the position of the latrines and bicycle store at one end of the building for both seniors and juniors is not to be commended. In the majority of the classrooms, the windows do not extend far enough into the corners of the outside wall, and the fire-places are too central for the comfort of the teachers, and occupy part of the black-board space. The general disposition of the rooms is good, but the minor details have not been so well considered. Some steps across the corridor on the first floor leading down to the exit staircases are badly placed. The elevations are very plain, but the half-inch scale detail is an interesting drawing in pencil and monotint wash.

Design Placed Third.

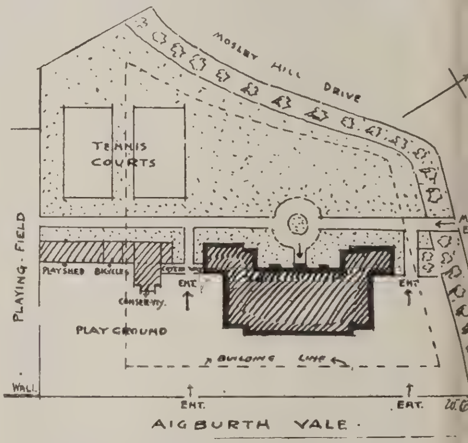
The third premium (£20) has been gained by Messrs. Willink & Thicknesse, of Liverpool. The type of plan adopted is an expensive one for a school where the cost is limited and clearly stated in the conditions—namely, £30 per head. In many points the plans bear a similarity to one of the premiated designs for the recent Newcastle-on-Tyne Grammar School. This scheme adapts itself to the peculiar shape of the site. Objectionable features are the long wings projecting on the south side, which contain cloak-room accommodation extending over 100ft. in length. The special rooms for teaching are also much larger than necessary; everything provided is on the same basis, except the height of the class-rooms.

Other Designs.

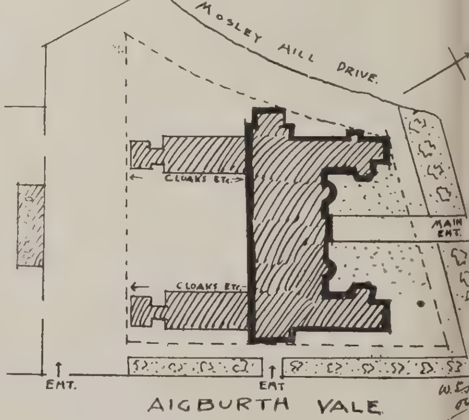
The set of drawings submitted by Mr. M. Honan, of Liverpool, were highly commended by the assessor; it is, in our opinion, superior in every respect to the third premiated. Some excellent schemes were prepared by the authors of Nos. 2, 31, 32, 26, 10, and 8. Internal areas were a noticeable feature in many designs.



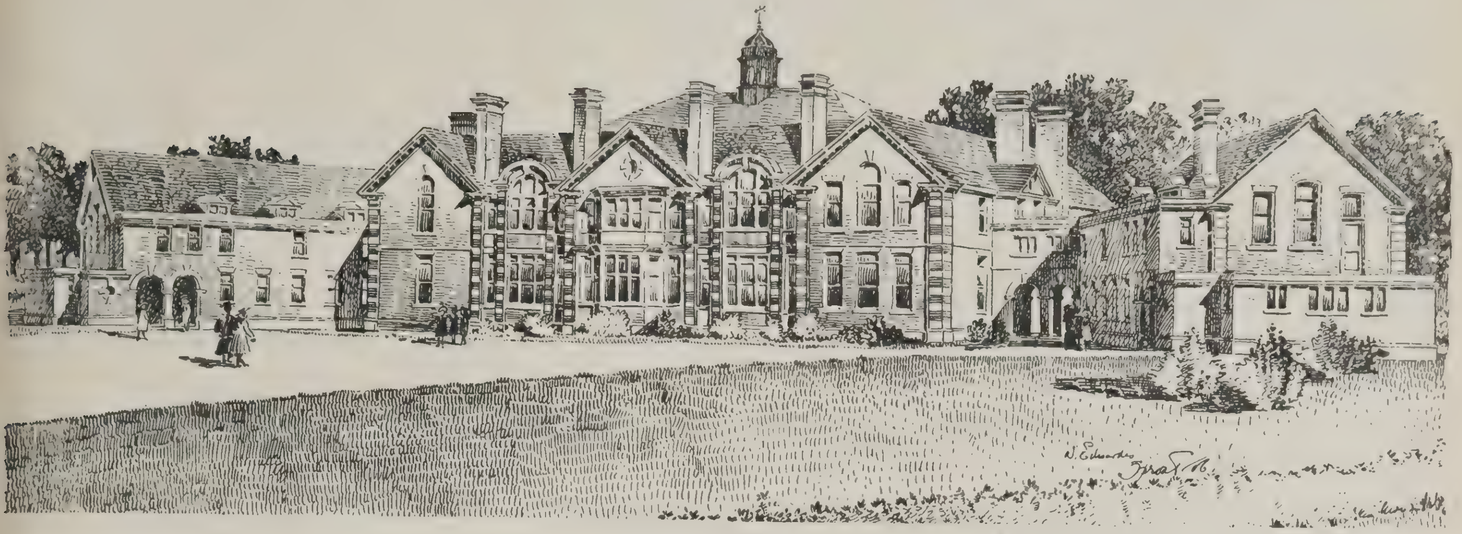
Block Plan of First-Premiated Design. Grayson and Ould, Architects.

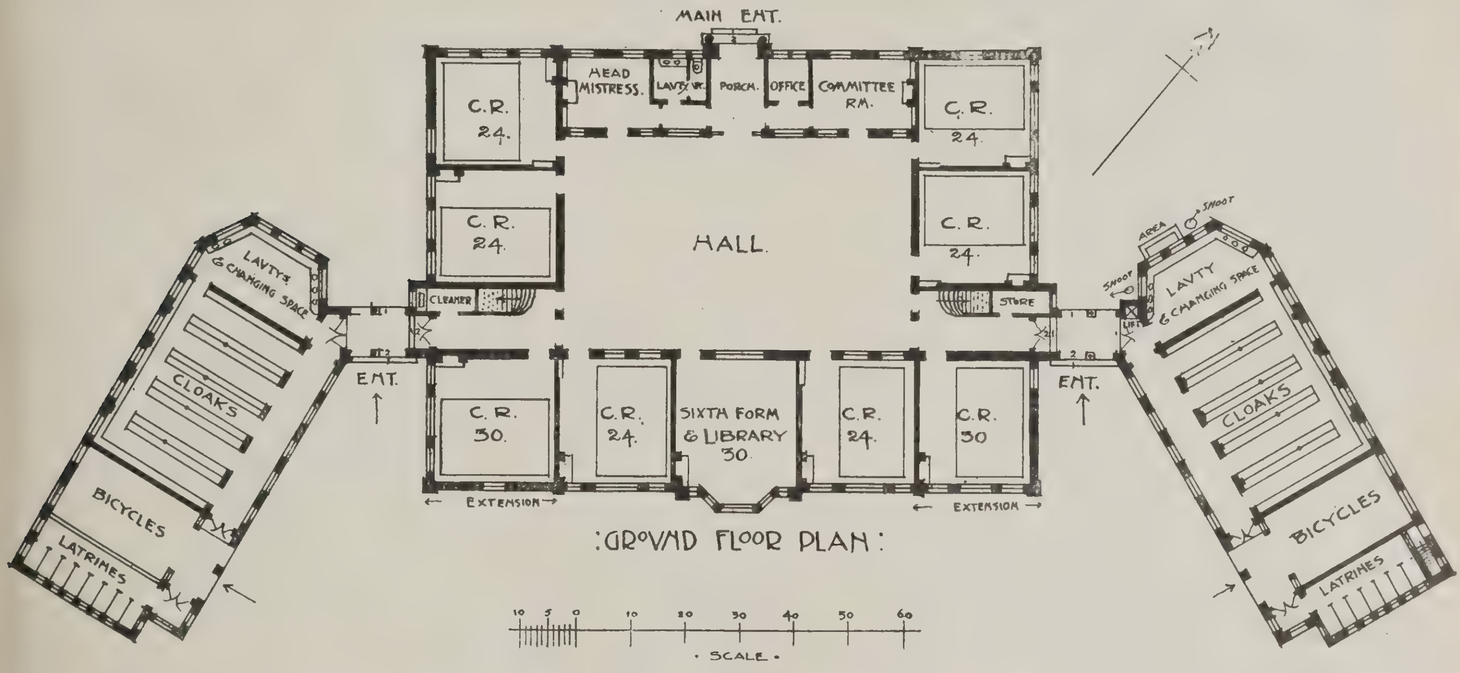


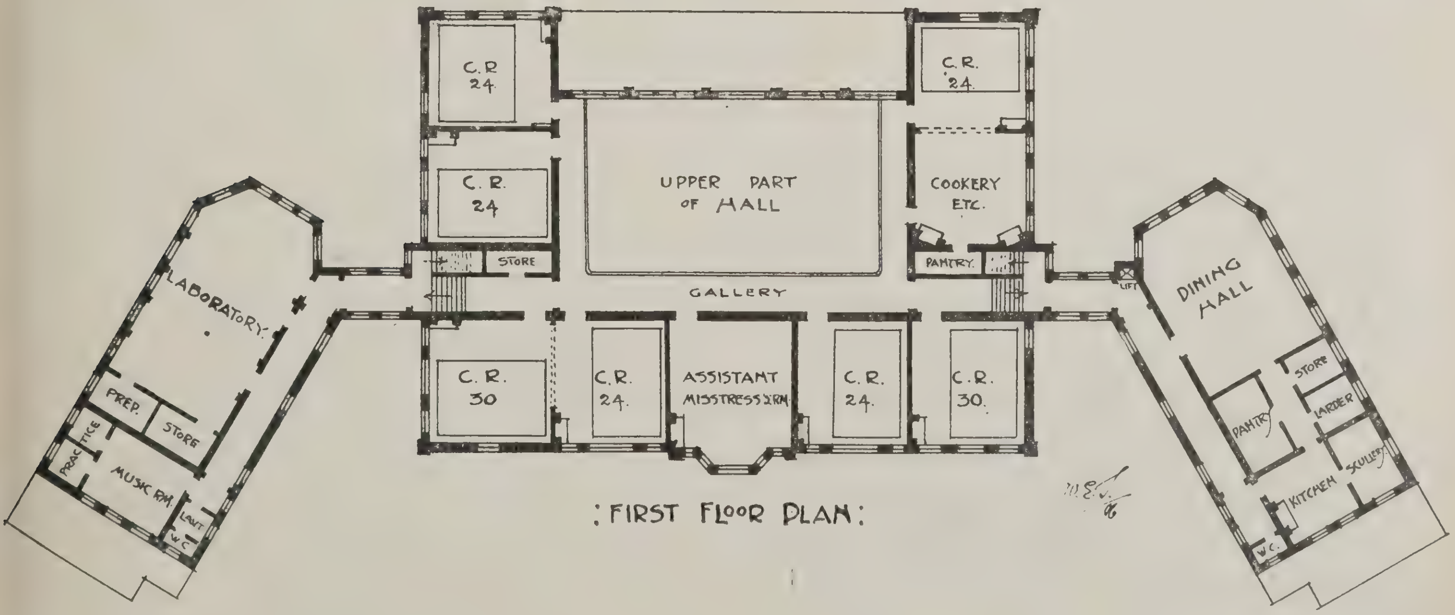
Block Plan of Second-Premiated Design. Appleyard and Quiggin, Architects.



Block Plan of Third-Premiated Design. Willink and Thicknesse, Architects.







GIRLS' SECONDARY SCHOOL, AIGBURTH VALE, LIVERPOOL: FIRST-PREMIATED DESIGN. GRAYSON AND OULD, ARCHITECTS.

THE BRADFORD CITY ARCHITECT'S DEPARTMENT.

A statement presented to the Finance Committee of the Bradford City Council relating to the cost of the City Architect's department, as compared with what the ordinary charges for the same work would have been if private firms had been employed, has given rise to some comment. The statement was that "the charge for the work which the City Architect (Mr. F. E. P. Edwards, A.R.I.B.A.) has done would average £3,202 a year for the five years he has been here if the work had been done by private firms, while his costs have been only £1,630 a year, thus making a saving to the Corporation of £1,573 a year."

Commenting on this, "A Bradford Architect" writes to the "Yorkshire Daily Observer" as follows: "Now, the annual charge of £3,202 payable to outsiders represents, on the basis of 5 per cent. commission, an average capital expenditure of £64,060 per annum, or, for the five years, a total of £320,300! What have we got to show for all this money? . . . The City Architect had nothing to do with the Cartwright Hall. That was done by Mr. Simpson. His department is credited with the plans of the Exhibition buildings—assisted by a Bradford architect—but those who could read this architect's 'writing on the wall' could not see much else. His department had nothing to do with the Fire Brigade Station, the enlargement of the Poor-law Offices, the Workhouse extension, the Rawson Square Markets, or any of the very large schools that have been built during the last five years. These have all been done by Bradford architects. . . . What buildings have been completed by the City Architect's department to represent this £320,300? The Morley Street Central Baths—assisted by a London bath expert architect, two or three district baths, a crematorium, the Exhibition buildings—assisted by a well-known Bradford architect; the Town Hall extension—assisted by Mr. Norman Shaw, architect; the famous colony of Faxfleet houses. . . . The one thing admitted that we may for the present take as correct is that £1,630 is the average annual cost of the City Architect's department, and that for these five years £8,150 has been its cost to the town. This on a 5 per cent. basis represents a capital expenditure of £163,000. Where are the buildings which even this sum represents, to say nothing of the extraordinary £320,300? . . ."

Notes and News

Toynbee Hall has just issued its "Educational Plans" for the forthcoming session, which opens on October 1st.

Mr. William Goldstraw, for many years building surveyor to the Liverpool City Council, is to retire on £366 a year.

A New Girls' High School at Leeds has been erected from designs by Messrs. Chorley, Connon & Chorley, architects, of Leeds.

Northampton Institute, Clerkenwell.—The "Announcements" for the session 1906-7 have been issued. Full courses in the crafts and trades allied to building and architecture are included.

L.C.C. Camberwell School of Arts and Crafts.—The tenth session begins on Sept. 24th. Evening classes are given in architecture, building construction, &c.; full particulars can be seen in the prospectus.

Junior Institution of Engineers. — Mr. William B. Bryan, Chief Engineer to the Metropolitan Water Board, has been elected president of the Junior Institution of Engineers for the ensuing session, in succession to Mr. Dugald Clerk.

The L.C.C. School of Building, at Ferndale Road, Brixton, opens its next session on September 24th. The principal of the school is Mr. F. W. Richards, and the director of architectural studies Prof. Beresford Pite, with Mr J. B. Fulton as assistant.

Public Slaughter-houses are to be erected by the Central Markets Committee at the Metropolitan Market, Islington. The new buildings, which will be the most up-to-date in the kingdom, will cost about £40,000. Excavations are now in progress on the site.

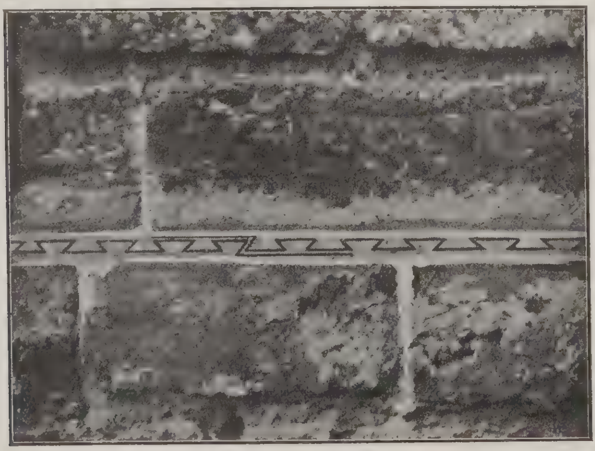
A Municipal Art School for Edinburgh is proposed. It is suggested that the school should be erected on the cattle market site at Lauriston Place, which the Town Council are willing to give for its erection. Plans have been prepared by Mr. Pittendre MacGillivray, R.S.A., and Mr. Morham, the City Architect.

New Premises in Huddersfield have been erected for the Huddersfield Industrial Society, Ltd., from designs by Mr. Joseph Berry, architect, of Huddersfield. The building faces Buxton Road, and has cost about £10,000. In the basement are a restaurant, a commercial room, smoke-room, kitchen, &c.; on the ground floor are furniture, boot and shoe, confectionery and chemist's departments, with an arcade in the centre leading to the Victoria Hall; on the first floor are showrooms for various departments, while on the second floor are stock-rooms; the attic being used as a workshop.

Trade and Craft.

A New Damp-course.

There are many damp-courses on the market, most of them consisting of bitumen in some form or another—as sheets, or laid with the trowel *in situ* like mortar. There are also, of course, the familiar stoneware, tile and slate damp-courses. A new damp-course, however, has just been introduced which embodies quite a novel principle. We illustrate it somewhat fully on this page. This damp-course consists of an aggregate piece of steel which is embedded in cement, as shown in Fig. 1. The protection which cement gives to iron is well known, and reinforced concrete work has shown it to be lasting. The preservative action of Portland cement is the same as lime—namely, its alkalinity, and as regards the protection which lime affords, we need only refer to the fact of iron dowels having been removed from mortar after very many years without the slightest trace of rust being apparent. For instance, Viollet de Duc, the eminent French architect, took some iron dowels out of Notre Dame, Paris, which must have been embedded in lime concrete or mortar for more than 300 years. They were found to be as bright as on the day they were inserted. This new "Dovetail Corrugated" steel sheet damp-course is supplied by the Fireproof Co., Ltd., of 10, York Buildings, Adelphi, London, in sheets 5ft. long, and in all widths from $4\frac{1}{2}$ins. upwards. For a distance of 3ins. the ends of the sheets are made plain, so as to serve for lap joints (see Fig. 2 and Fig. 3; the latter illustration shows the method of lapping the sheets at a corner joint). The method of using this damp-course is simply to cover the wall with a layer of cement about $\frac{5}{16}$in. thick and to lay the sheet upon it, pressing it well into the cement. The upper surface is then covered with a layer of about equal thickness, and the damp-course is complete. This damp-course has the advantage of being quickly and cheaply laid, with no liability to squeeze out or crack.



A NEW STEEL AND CEMENT DAMP-COURSE.

FIG. 1.

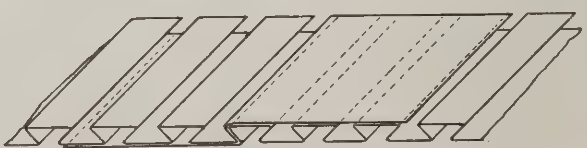


FIG. 2.

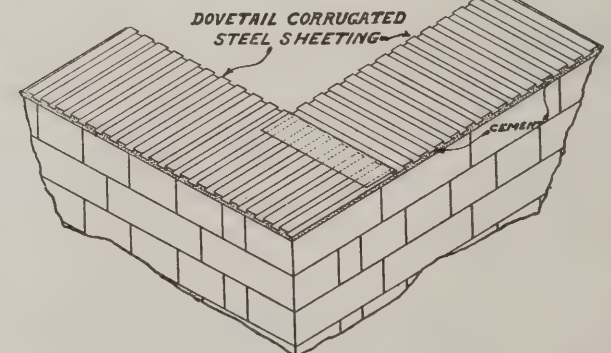


FIG. 3.

Complete List of Contracts Open.

WITH a few exceptions, news of Contracts Open are not repeated after they have been published once in these columns, so that readers will find particulars in our previous issues of other contracts that still remain open.

Unless expressly stated to the contrary, all deposits required for bills of quantities, &c., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair-wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

Sept. 20. Greenodd.—*Erection of a house at Greenodd*, for Dr. Hawksworth. Plans and specifications may be seen and quantities obtained at the office of Settle & Brundrit, A.R.I B.A., architects, Ulverston and Barrow-in-Furness. Sealed tenders, endorsed "House, Greenodd," to be delivered at the office of the architects, not later than noon, Sept. 20.

Sept. 21. Rhydfendigaid.—*Reconstructing Calvinistic Methodist Chapel.* Plans and specifications may be seen with J. Arthur Jones, architect, Cambrian Chambers, Aberystwyth, or upon application to Mr. J. Rees, Council Schoolhouse, Pontrhydfendigaid, to whom sealed tenders are to be delivered not later than Sept. 21.

Sept. 21. London, N.—*Erection of a new sorting office* at Mill Hill, N. Drawings, specifications, and a copy of the conditions and form of contract may be seen on application to Mr. J. Wager, H.M. Office of Works, Westminster. Bills of quantities and forms of tender may be obtained from the Secretary on payment of one guinea, and tenders to be delivered to him before 12 noon on Sept. 21, endorsed "Tender for Mill Hill Sorting Office."

Sept. 21. Nelson.—*Following work required in connection with the erection of brickmaking plant at the Refuse Destructor Works in Charles Street*:—1.—Steel work. 2.—Joiner's work 3.—Glazier's work. 4.—Slater's work, for the Health Committee. Plans and specifications may be seen and forms of tenders obtained on application at the office of B. Balt, A.M.I.C.E., borough engineer and surveyor. Tenders, endorsed "Brickmaking plant, —— work," to be sent to J. H. Baldwick, town clerk, Town Hall, Nelson, not later than noon on Sept. 21.

Sept. 21. London, W.—*Re-erection of a lodge* at Wormwood Scrubs, W., for the L.C.C. Drawings may be inspected, and specifications, bills of quantities, form of tender, and other particulars obtained at the Architect's Department, 15, Pall Mall East, S.W., upon payment of 10s., which amount will be returned to the tenderer, provided he shall have sent in a bona fide tender. Fair wages clause. Tenders to be delivered at the County Hall, addressed to the Clerk of the London County Council, Spring Gardens, S.W., and marked "Tender for the Re-erection of a Lodge at Wormwood Scrubs," not later than 10 a.m. on Sept. 21.

Sept. 21. London, E.—*Repairs, &c., at the mansion in the Island Gardens, Poplar*, for the L.C C. Drawings may be inspected, and specifications, bills of quantities, form of tender, and other particulars obtained at the Architect's Department, 15, Pall Mall East, S.W., upon payment of 10s., which amount will be returned to the tenderer, provided he shall have sent in a bona fide tender. Fair wages clause. Tenders to be delivered at the County Hall, addressed to the Clerk of the London County Council, Spring Gardens, S.W., and marked "Tender for Repairs, &c., at the Mansion, The Island Gardens," not later than 10 a.m. on Sept. 21.

Sept. 22. Pontnewydd.—*Erection of a villa at Pontnewydd* for Dr. A. W. Hayles. Plans and specifications may be seen and all particulars obtained at No. 1, Chapel Street, Pontnewydd. Tenders to be delivered by Sept. 22.

Sept. 22. Broomford.—*Rebuilding the County Bridge at Broomford*, in the parish of Jacobstowe, for the Okehampton R.D.C., according to plans and specifications which may be seen at the office of S. Hooper, surveyor, Hatherleigh. Tenders, endorsed "Broomford Bridge," must be sent to S. Hawken. clerk to the Council, Okehampton, by 10 a.m. on Sept. 22.

Sept. 22. Newcastle-on-Tyne.—*Erection of a register office* for Superintendent Registrar, also for alterations to the Union Offices, Pilgrim Street. Names to be sent in by Sept. 22, to James Atkinson, clerk to the Guardians, Union Offices, 127, Pilgrim Street, Newcastle-upon-Tyne. Quantities will be forwarded in due course by the architect, Mr. A. Stockwell, 11, Pilgrim Street, Newcastle, at whose office the plans may be inspected and any further information obtained.

Sept. 22. Nordelph (Upwell).—*Conversion of house into two cottages. Drainage and sub-division of yard and buildings. Fencing of grass land* at the Chapel Farm House, Nordelph. Plans and specifications and conditions of contract may be seen at E. C. Warner's, at Nordelph. Tenders (in sealed envelopes) must be delivered before 10 o'clock on Sept. 22, to G. C Davies, deputy-clerk of the Norfolk County Council, 11, Prince of Wales Road, Norwich, endorsed "Nordelph—Tender." Each tender must state within what time the contractor will undertake to complete the work, as time is of importance.

Sept. 24. Raskelf.—*Erection of a farm house* at Cold Harbour, Raskelf, near Easingwold, for the Ecclesiastical Commissioners. Plans and specifications may be seen and quantities obtained with Thomas Stokes, architect, Thirsk, to whom tenders must be delivered not later than 10 a.m. on Sept. 24.

Sept. 24. Trehafod, near Pontypridd.—*Supply and erection of car-sheds at Trehafod, near Pontypridd*, for the Pontypridd U.D.C. Plans and specifications may be seen, and quantities obtained, at the office of P. R. Willoughby, engineer and surveyor to the Council, upon receipt by J. C. Jones, clerk to the Council, Municipal Buildings, Pontypridd, of a deposit of £1 1s. Sealed tenders, endorsed "Car-sheds—Buildings," must be received by J. C. Jones on or before Sept. 24.

Sept. 24. Middlesbrough.—*Erection of Wesleyan Church, Woodlands Road, Middlesbrough.* Contractors' names to Danby & Simpson, architects, 73, Albion Street, Leeds, not later than Sept. 24, when quantities and other information will be duly forwarded.

Sept. 24. Altwen.—*Erection of two shops* at Altwen for the Altwen and Pontardawe Co-operative Society, Ltd. Persons desirous of tendering can see plans, details, specification, and obtain all particulars at the offices of the architect, Herbert Street, Pontardawe, or Wind Street, Swansea. Tenders to be sent in to the secretary, Mr. Walters, Altwen, near Pontardawe, on or before Sept. 24

Sept. 25. Abergavenny.—*Alterations and additions to the Town Hall, Abergavenny.* Plans and specifications may be seen and bills of quantities obtained on payment of a deposit of £2 2s. at the offices of E. A. Johnson, F.R.I.B.A., architect, Abergavenny. Endorsed tenders to be sent to J. T. Rutherford, town clerk, not later than Sept. 25.

Sept. 25. Eyrecourt (Co. Galway).—*Erection of new schools* in Eyrecourt and Woodford, Co. Galway, for the Sisters of Mercy. Plans and specifications can be seen at the Convents of Mercy, Eyrecourt and Woodford, and at the office of William H. Byrne & Son, architects, 20, Suffolk Street, Dublin. Tenders to be sent in by Sept. 25.

Sept. 25. Redruth.—*Erection of a new Secondary School* at Redruth, according to plans and specifications prepared by Mr. Morley Collins, architect, Clinton Road, Redruth, at whose office the plans may be seen and all information obtained. Sealed endorsed tenders to be sent to F. R. Pascoe, secretary, Education Office, Truro, on or before Tuesday, Sept. 25.

Sept. 25. Alfreton.—*Pulling down a house and boundary walls, building new walls, and doing other work in connection therewith* at Pye Bridge in the U.D. of Alfreton. Plans may be seen and specification and other particulars may be obtained by application at the office of E. Houfton. Sealed tenders, endorsed "Widening," to be delivered at the Surveyor's Office, King Street, Alfreton, at or before 3 p.m. on Sept. 25.

Sept. 25. Brighton.—*Conversion of two rooms into one room* at The Warren Farm Schools, Rottingdean. Copy of specification and form of tender, together with any further information, can be obtained on application to Mr. E. Wright, architect to the Guardians, at the Parochial Offices, Prince's Street, Brighton, where plans may also be inspected. Sealed tenders endorsed "Tender for Conversion of Day Rooms," are to be addressed to B. Burfield, clerk to the Guardians, and delivered at the Parochial Offices by 10 a.m. on Sept. 25.

Sept. 26. Sherburn Hill.—*Erection of new premises for the Butchering Department.* Plans and specifications can be seen at the offices of the Sherburn Hill Co-operative Society, Sherburn Hill, near Durham. Sealed tenders, endorsed "New Butchering Dept.," to be delivered to T. Robson, secretary, not later than noon on Sept. 26.

Sept. 26. Drumcondra.—*Alterations and additions to the Dispensary House, Drumcondra*, in accordance with the plans and specification, which can be seen and copied at the Board-room, North Brunswick Street, Dublin, on and after Sept. 11, on lodgment of a cheque for £1. Fair wages clause. Sealed tenders will be received in the tender box here up to 12 o'clock noon on Sept. 26.

Sept. 26. Armagh.—*Erection of artisans' dwellings on Banbrook Hill*, in the city of Armagh, for the U.D.C., the clearing and laying out of the site, the construction of roads, paths, sewers, manholes, and other works in accordance with plans and specifications prepared by F. Bergin, B.E., 36, Westmoreland Street, Dublin. The plans and specifications may be seen of J. Lennon, town clerk, U.D.C. Offices, Armagh, on any day between the hours of 10 a.m. and 2 p.m., where copies of the tender form and schedule of quantities may be obtained by making a deposit of £1 1s. Tenders, accompanied by schedule of prices and containing the names and addresses of two solvent sureties willing to join in a bond for £1,000 for the due performance of the contract will be received by him up to 6 o'clock on Sept. 26. Tenders should be addressed to the presiding Chairman, and endorsed, "Tender for the erection of Artisans' Dwellings." No tender will be considered which is not on the proper form.

Sept. 27. Grays.—*Alterations at the fire station* for converting the old steam roller shed into an office for the sanitary inspector, for the U.D.C. Plan and specification may be seen at the Surveyor's office. Tenders are to be delivered to Hatten & Asplin, clerks to the Council, District Council Offices, Grays, endorsed "Tender for Alterations," by noon on Sept. 27.

Sept. 27. London, E.—*Additions and alterations in the building at the Electricity Works*, Osborn Street, Whitechapel, E. Persons tendering must submit the names and addresses of two substantial persons willing to be jointly and severally bound for the due and proper performance of the contract. Fair wages clause. The drawings may be seen and copies of the stipulations, specification, schedule, and form of tender may be obtained by applying to M. W. Jameson, A.M.Inst.C.E., borough engineer, 15, Great Alie Street, Whitechapel, E., between the hours of 10 a.m. and 12 noon, upon paying £5. Tenders, endorsed "Tenders for Additions to Electricity Buildings," should be sent to G. W. Clarke, town clerk, 15, Great Alie Street, Whitechapel, E., in the envelopes supplied, so as arrive at this office on before 12 o'clock noon on Sept. 27.

Spt. 27. Dewsbury.—*Erection of extensions to the infirmary at the workhouse.* Plans and specifications may be seen, and bills of quantities obtained, at the offices of Holtom & Fox, architects, Corporation Street, Dewsbury, on and after Sept. 15. Sealed tenders, endorsed "Infirmary Extensions," must be left at the Union Offices, not later than Sept. 27. and such tenders will be opened and considered by the Guardians on Sept. 28.

Sept. 27. Ashford.—*Building of a laundry at the schools at Ashford, Middlesex.* Copies of the specification, bills of quantities, and tender forms may be obtained, and the drawings and site inspected on application at the office of F. G. Beeching, clerk to the managers, West London District Schools, Ashford, Middlesex, between the hours of 10 a.m. and 4 p.m., accompanied by a deposit of a £5 Bank of England note. The site must be inspected. Tenders must be delivered to F. G. Beeching (as per instructions with the forms) not later than 6 p.m. on Sept. 27.

Sept. 27. Withernsea.—*Erection of an Infant School and for additions and alterations to the Council School, Withernsea*, for the Education Committee of the East Riding of Yorkshire. Plans and specifications may be seen and form of tender and copies of quantities obtained, on application to the Building Surveyor, County Hall, Beverley, upon depositing £1 1s. The plan and specification can also be seen at the Council School, Withernsea. Tenders, endorsed "Withernsea Council School," to be forwarded not later than Sept. 27 to J. Bickersteth, Clerk to the East Riding Education Authority, County Hall, Beverley.

Sept. 27. Dorchester.—*Construction of suitable furnaces for the complete combustion of the refuse of the town* in such a manner that the heat generated therefrom may be utilised for raising steam for pumping the water at the Borough Waterworks in conjunction with the existing boilers and plant. Plans and sections of the existing buildings and surroundings, together with detailed conditions for the guidance of those desirous of submitting schemes will be supplied on application to G. J. Hunt, borough engineer and surveyor, Guildhall Chambers, Dorchester, provided that a £5 Bank of England note accompanies the application as a guarantee of good faith. Schemes must be received not later than Sept. 27, endorsed "Tender for Refuse Destructor," addressed to A. G. Symonds, town clerk, 11, South Street, Dorchester.

Sept. 29. Penzance.—*Seamen's Institute at Green Street, The Quay, Penzance.* The drawings and specifications may be seen at the offices of the architect, O. Caldwell, Penzance, to whom tenders are to be sent on or before Sept. 29.

Sept. 29. Stourton.—*Providing and erecting 490 yards of creosoted redwood fencing, 6ft. high, round the new sewage disposal works at Stourton. Also separate tenders for about 9 yards of iron fencing, 5ft. high, including fixing at the works.* for the U.D.C. of Rothwell. Plans and specifications can be seen and particulars obtained at the offices of E. J. Silcock, M.I.C.E., engineer, 10, Park Row, Leeds. Sealed tenders, endorsed "Stourton Fencing" or "Iron Fencing" must be delivered to W. Dodgson, clerk to the Council, Council Offices, Rothwell, near Leeds, not later than Sept. 29.

Oct. 2. Christiania, (Norway).—*Supply and erection of a signal and point lever box at Hundalen station* on the Ofoten railway (one of the Norwegian State Railways). Tenders through agent residing in Norway to be delivered not later than Oct. 2. Apply, 10 kr. deposit, "Driftsbestyrerens Kontor, Narvik."

Oct. 3. Devizes.—*Erection of shedding*, and the whole of the other necessary works in connection with the show yard for the meeting of the Wiltshire Agricultural Association, to be held at Devizes in 1907. Specifications of the work required and forms of tender may be obtained of the Secretary of the Association, Market Lavington, Devizes, on payment of one guinea, which amount will be refunded upon receipt of a bona fide tender. Tenders to be delivered by 10 a.m. on Oct. 3, sealed and endorsed "Tender for Shedding," to the Secretary.

Oct. 3. Weymouth.—*Constructing and maintaining retaining wall about 510 feet in length, of ferro-concrete work (Hennebique's system) on the north side of the Pile Pier within the borough, filling in and levelling up between the existing pier and the intended wall, new fences, Portland stone coping, and other works* appertaining thereto. Plans, specification, and condition of contract may be seen and form of tender obtained on application at the office of W. Barlow Morgan, borough engineer, Municipal offices, Weymouth. The contractor whose tender is accepted will be required to enter into a bond with a Guarantee Assurance Company to be approved by the Council for the due performance of the contract. Tenders, enclosed in the Official envelope, sealed and endorsed "Retaining Wall Pile Pier," to be delivered to H. A. Huxtable, town clerk, Municipal Offices, Weymouth, on Oct. 3 next, by 10,30 a.m.

Oct. 4. Levenshulme.—*Erection of new Technical School*, at the rear of the Chapel Street Council School, Chapel Street, Levenshulme. Specifications, bills of quantities, and further particulars may be obtained on application to the architect, Mr. Henry Littler, 16, Ribblesdale Place, Preston, on payment of £3 3s., which will be returned on receipt of a *bona fide* tender. Tenders, endorsed "Tender for new Technical School," to be sent on or before Oct. 4, to J. Ogden Hardicker, clerk, Northern Assurance Buildings, Albert Square, Manchester.

Oct. 5. London, N.E.—*Erection of a two-storey school, manual training centre, cookery centre, caretaker's cottage, &c.*, on the Aldersbrook School site, Ingatestone-road, in the Urban District of Wanstead, Essex. Drawings and specifications may be inspected, and copies of the bills of quantities obtained at the offices of C. H. Bressy, architect, 70 and 71, Bishopsgate Street Within, E.C., upon payment of a deposit of £2. The contractor whose tender is accepted will be required to obtain the bond of an approved guarantee society in an amount equal to 25 per cent. of the amount of tender as security for the due performance of the contract. Sealed tenders, endorsed "Aldersbrook School Tender," and addressed to the Chairman, W.L.A.S.C. Council Offices, Wanstead, N.E., must be delivered before 6 p.m. on Oct. 5.

No date.—Blackpool.—*Re-flooring, painting and repairs to the plaster* of the two old blocks at the Sanatorium, New Road. Further particulars may be obtained from F. J. H. Coutts, Medical Officer of Health, Birley Street, Blackpool.

No date. Tunstall.—*New building*, for The Henry Richards Tile Works, Tunstall. Builders please apply to A. R. Wood & Son, architects, Tunstall, for particulars.

ENGINEERING.

Sept. 20. Andover.—*Erection of a steel girder and concrete bridge* near Lower Mill, Long Parish, for the R.D.C. Persons desirous of tendering may see the plans and obtain copies of the specification and bill of quantities and all requisite information on application to J. Wormald, district surveyor, the South Cottage, Andover. Sealed tenders upon the forms supplied, endorsed "Tender for Bridge," to be delivered to W. R. Graham, clerk to the R.D.C., Andover, on or before Sept. 20.

Sept. 20. Netherlands.—*Supply and delivery of the following materials:*—Contract No. 426.—Ironwork with appurtenances for two upright cocks. Contract Lit. Y. 12.—Metal superstructure for two bridges for ordinary traffic. Contract XCV.—Catch bolts, hook bolts, and cogged wheel bolts. Contract XCVI.—Ironwork with appurtenances for a water-closet. Contract XCVII.—50 buffers and 150 traction hooks. Contract XCVIII.—400 cast iron chairs. Particulars are obtainable from Mr. M. Nijhoff, at the Hague, at a cost of 2s. 6d. for contracts 426 and Lit. Y. 12, and of 1s. 8d. for the others. H.M. Consul at Rotterdam (H. Turing) reports that tenders will be received on Sept. 20 at the Colonial Office at the Hague.

Sept. 20. Norway.—*Supply of water pipes to the Bergen Railway, now in course of construction*, for the Norwegian State Railways. The description of pipes required is as follows: 470 metres 7ins. diameter (inside) cast-iron socket-pipes; 310 metres 6ins. diameter (inside) cast-iron socket-pipes; 500 metres 3ins. diameter (inside) cast-iron socket-pipes; 230 metres 2ins. diameter (inside) galvanised pipes. Tenders in sealed envelopes marked "Anbud paa Vandledningsrör," may be delivered at "Overingeniörens Kontor Nes i Hallingdal." up to Sept. 20. A copy of the general conditions of tender for supplies required by the Norwegian State Railways, and of the special conditions of tender to the Bergen Railway, in the original Norwegian, may be seen at the Commercial Intelligence Branch of the Board of Trade, 73, Basinghall Street, E.C. Note.—Apart from the usual Customs duties, a preference of from 10 to 15 per cent. is given to Norwegian manufacturers. In all cases of Norwegian Government contracts it is obligatory that a resident agent should act for tenderers not residing in Norway, and be responsible to the Government, but it is not necessary for the agent to be a Norwegian firm.

Sept. 24. Roumania.—*Carrying out canalisation and water supply works* in that town at the estimated cost of 8.547,401 lei (about £341,896) and 1,887,607 lei (about £75,504) respectively. Particulars may be obtained from the offices of the Municipality, Jassy. Tenders will be opened on Sept. 24, at the above offices.

Sept. 26. South Dublin.—*The maintenance and keeping in repair of the public fountains for water supply within the rural district.* The R.D.C. will meet on Sept. 26 to consider tenders. Specification and schedule may be seen at the Council's offices, 1, James's Street, Dublin, where also forms of tender may be obtained. Sealed and endorsed tenders must be lodged with the Clerk of the Council not later than 11 a.m. on Sept. 26.

Sept. 26. Rose Grove, near Burnley.—*Widening of the bridge over the Leeds and Liverpool Canal at Padiham Junction*, Rose Grove, near Burnley, for the directors of the Lancs and Yorks Railway. Plans and specifications can be seen and form of tender and quantities obtained on application at the engineer's office, Hunt's Bank, Manchester. Tenders, endorsed "Tender for Widening Bridge at Rose Grove," to be in the hands of R. C. Irwin, secretary, Hunt's Bank, Manchester, not later than 10 o'clock on the morning of Sept. 26.

Sept. 28. Hemel Hempstead.—*Rebuilding of a county bridge and works of widening the main road, embracing alterations to buildings at Two Waters, Hemel Hempstead.* Persons desirous of contracting for the work may see the specifications, agreement, &c., at the County Surveyor's Offices, Hatfield, between the hours of 10 a.m. and 4 p.m., except on Saturday, when they will be on view from 10 a.m. to 12 mid-day. A copy of the specification and schedule of works and prices and a form of tender can be obtained at the county surveyor's Office upon payment of £2. 2s Sealed tenders endorsed "Tenders for New Bridge and Works at Two Waters" must be delivered to U. A. Smith, county surveyor, County Surveyor's Office, Hatfield, not later than Sept. 28. Such security for the due execution of the works as the Council may require must be given by the contractor.

Sept. 30. Zurich.—*Supply and erection of turbines and electric machinery* to the Municipal generating station at Zurich. Tenders will be opened on Sept. 30 at the "Stadtischer Bauvorstand II."

Oct. 1. Dublin.—*Tenders for electrical plant* in good condition, at present in use but no longer required, at the Science and Art Museum and adjoining buildings in Kildare Street, Dublin, will be received up to 12 o'clock noon on Oct 1. Tenders should be addressed to the Secretary, Office of Public Works, Dublin. The plant comprises three Willans patent central-valve compound engines. mounted on same bedplate as and directly coupled to three Johnson and Phillips Kapp-type half-compounded dynamos, 112 volts by 450 amperes, 450 revolutions, with steam pipes, connections to switchboard, &c.; three positive and one negative slate switchboards, with switches, instruments, &c., and one for connection of dynamos in parallel; five Elihu Thomson meters; one Parker booster for 58 cells; one 58-cell battery and switchboard, with charging and discharging switches, resistance, &c., complete. Contractors to remove the plant and make good after removal at their own cost to the satisfaction of the Board.

Oct. 2. Chipping Campden.—*Provision, laying, and jointing of about 6,800yds. of 5-in. cast-iron pipes, 3,200yds. of 4-in. cast-iron pipes, 2,500yds. of 3-in. cast-iron pipes, and 540yds of 2-in. cast-iron pipes.* Together with all special castings, valves, and hydrants required; also for the construction of service reservoir and other works in accordance with the drawings and specifications prepared by the engineers for the R.D.C. Drawings and specification may be seen and bills of quantity and form of tender obtained at the offices of Willcox & Raikes, engineers, 63, Temple Row, Birmingham, on payment of a deposit of £3 3s. Sealed tenders, in envelopes supplied, endorsed "Moreton-in-the-Marsh Water Supply—Contract No. 1," to be delivered to O. H. New, clerk to the Council, Chipping Campden, not later than 12 o'clock noon on Oct. 2.

Oct. 31. Zagazig.—*Installation of a supply of drinking water in the town of Zagazig*, in accordance with plans and specifications to be seen at the Ministry of the Interior. Tenders made out on stamped paper, obtainable from Lieut.-Col. Western, R.E., C.M.G., Queen Anne's Chambers, Westminster, S.W., and marked "Offre pour les travaux d'installation d'eau à Zagazig," should be addressed to "S. E. le Sous-Sécrétaire d'Etat, Ministère de l'Intérieure, Cairo," where they will be received up to Oct. 31. A deposit of 10 per cent. of the estimate is required to qualify any tender. Conditions of tender, together with lists of the materials and machinery required may be seen at the Commercial Intelligence Branch of the Board of Trade, 73, Basinghall Street, E.C.

IRON AND STEEL.

Sept. 21. Malta.—*Supply of cast-iron pipes and irregular castings.* Sealed tenders will be received at the office of the Receiver-General and Director of Contracts, Valletta, up to 11 a.m. on Sept. 21. Tenders are to be accompanied with a deposit of £100, to be made in the office of the Crown Agents for the Colonies, Whitehall Gardens, London, by tenderers residing in Great Britain, not having a representative in Malta, and in the above-named office by local tenderers. Particulars, specifications, &c., may be obtained on application at the office of the Receiver-General and Director of Contracts, Valetta, or to the Crown Agents for the Colonies, Whitehall Gardens, London.

Sept. 21. Valletta.—*Supply of cast-iron pipes and irregular castings.* Tenders will be received at the office of the Receiver-General and Director of Contracts, Valletta, up to 11 a.m. on Sept. 21. Tenders are to be accompanied with a deposit of £100, to be made in the office of the Crown Agents by tenderers residing in Great Britain not having a representative in Malta, and in this office by local tenderers. The tenderer whose offer is accepted shall be held to have bound himself to an agreement, and may be compelled to carry out the obligations arising from his tender, even though he may not have signed a formal contract. Particulars, specifications, &c., may be obtained on application to J. Huber, Acting Receiver-General and Director of Contracts, Valletta, or to the Crown Agents for the Colonies, Whitehall Gardens, London.

Sept. 22. King's Lynn.—*Purchase of old iron and steel*, consisting of oil mill machinery, rails, chairs, scrap, &c., lying at the Alexandra Dock, all easy of access to rail or vessel. Can be viewed on application at the Alexandra and Bentinck Dock, King's Lynn, Norfolk. Tenders, marked "Old Iron," to be sent to A. G. Russell, general manager, Alexandra and Bentinck Docks, King's Lynn, Norfolk, not later than Sept. 22.

Sept. 25. London, N.W.—*Supply of 2,830ft. lineal of wrought iron unclimbable adjustable fencing, 4ft. 6in. in height, and two pairs of 9-ft. gates of similar pattern to fencing*, delivered to new Recreation Ground, Harrow Road, Stonebridge, Willesden, N.W., for the Willesden D.C. Specification and form of tender can be obtained on application to O. C. Robson, M.I.C.E., engineer to the Council, Public Offices, Dyne Road, Kilburn, N.W. The tenders, upon printed forms, and endorsed "Wrought Iron Fencing, Recreation Ground, Stonebridge," to be delivered at the offices of the Council not later than 4 p.m. on Sept. 25. A £10 note to be enclosed with each tender.

PAINTING AND PLUMBING.

Sept. 22. Wivenhoe.—*External painting of the tank at the water tower*, situate at the Cross, Wivenhoe, in the County of Essex, for the U.D.C. Further particulars to be obtained of the surveyor, R. H. Barrell, The Cross, Wivenhoe. Sealed tenders must be delivered to C. W. Denton, clerk, East Stockwell Street, Colchester, not later than 5 p.m. on Sept. 22.

Sept. 25. Leyton.—*Painting work required to be done to the outside of the Town Hall and Technical Institute, High Road*, Leyton, and Greenhouse on the Council's land in Oliver Road, for the U.D.C. Specification and form of tender and other particulars may be obtained from W. Dawson, M.I.C.E., the Surveyor to Council, at his offices, Town Hall, Leyton, between the hours of 10 and 4 (10 and 12 on Saturdays). Sealed tenders (in special endorsed envelopes supplied with the forms) must be delivered at the meeting of the Council to be held at the Town Hall, Leyton, on Sept. 25, at 7 o'clock p m.

Sept. 24. Leeds.—*Cleaning paint work and limewashing at the depot, in Dock Street.* For particulars and forms of tender apply to the Superintendent, Dock Street Depot. Tenders, endorsed "Limewashing," to be delivered at the Town Clerk's Office, by 10 a.m. on Sept. 24.

Sept. 24. Manchester.—*Painting various bridges over the Rochdale Canal and the River Medlock.* Specification and form of tender may be obtained on application at the City Surveyor's Office, Town Hall, on payment of £1 1s. to the City Treasurer. All cheques or postal orders are to be made payable to the order of "The Corporation of Manchester." Tenders, enclosed in the official envelope, and addressed to the Chairman of the Paving, &c. Committee, to be delivered at the City Surveyor's Office, not later than 10 a.m. on Sept. 24.

Sept. 26. Manchester.—*Painting of the Poor Law Offices and the Workhouse in New Bridge Street, Manchester.* Specifications may be obtained at the office of A. J. Murgatroyd, architect, 23 Strutt Street, Manchester, on payment of a deposit of 10s. 6d. Sealed tenders, endorsed "Painting at New Bridge Street," to be delivered to J. Macdonald at the Poor Law Offices, New Bridge Street, Manchester, not later than 3 p.m. on Sept. 26, on which day they will be opened by the Guardians.

Oct. 1. Hull.—*Painting, &c., at the Relief Station, St. George's Road, Hull*, for the Sculcoates Union. Forms of tender and all particulars can be obtained or will be sent by post, on application to J. H. Wild, solicitor, clerk to the Guardians, Union Offices, Harley Street, Hull. Fair wages clause. Tenders must be sent to Mr. Wild so as to be received not later than 10 o'clock on Oct 1.

ROADS AND CARTAGE.

Sept. 21. Helston.—*Two steam rollers for 70 days each for steam rolling certain roads* within the district for the R.D.C., and parties willing to tender for the supply of these should send full particulars, terms, &c., to A. E. Ratcliffe, clerk to the Council, Helston, not later than Sept. 21. The party whose offer may be accepted will be required to commence rolling on Oct. 29.

Sept. 21. Bodmin.—*Two 10-ton steam rollers, at per day of eight hours for about three months each, Driver, flagman, two water carts*, for the R.D.C. The contractors are to be responsible for any damage that may be done by the rollers to persons or property during the time they are engaged by the Council, and to satisfy the Council that their employees are insured against Employers' Liability risks. The rollers to commence work when and as required, and to work each day from 8 a.m. to 12 noon and from 1 p.m. to 5 p.m., and the whole of the work to be done under the direction and to the satisfaction of the Council's surveyors. Tenders, sealed and endorsed "Tenders for Steam Rolling," to be delivered to J. Pethybridge, clerk to the Council, Mount Folly, Bodmin, on or before Sept. 21.

Sept. 24. Liverpool.—*Road making and drainage* in connection with buildings now in course of erection at Olive Mount, Wavertree, according to plans and specifications to be seen at the office of the architect, E. Kirby, 5, Cook Street, Liverpool, between the hours of 10 a.m. and 5 p.m. Bills of quantities, conditions of contract, and forms of tender (upon which alone offers will be received) may be obtained at 5, Cook Street, on payment of a deposit of £2. Sealed tenders must be delivered to H. J. Hagger, vestry clerk, Parish Offices, Brownlow Hill, not later than Sept. 24.

Sept. 24. Sevenoaks.—*2,000 yards of clean local stone*, or any less quantity according to the specification prepared by the Surveyor to the Council, to be delivered otherwise than by traction engines, on or before Oct. 31, at the following depots within their district:—Seal Road, 300 yards (broken); Seal Hollow Road, 300 yards (broken); Blackhall Lane, 150 yards (broken); St. Botolph's Road, 250 yards (broken); Mt. Harry Road (East), 50 yards (broken); Hitchin Hatch Lane, 150 yards (broken); Oak Lane, 200 yards (broken); Britain's Lane, 400 yards (broken); Council's Yard, 100 yards (unbroken); Common Road, 200 yards (unbroken); Gracious Lane, 50 yards (unbroken); St. Julians, 50 yards (unbroken), for the U.D.C. Sealed tenders to be addressed to the Clerk to the Council, Urban Council Offices, Sevenoaks, and endorsed "Tender for road metal, &c." and delivered on or before Sept. 24. A sample of one cubic yard of road metal to be delivered at the Council's Yard by the same day, free of charge.

Sept. 25.—Gateshead.—*Paving, &c., the following streets (1) Pitt Street; (2) Orton Street; (3) Back Orton Street, East; (4) Back Orton Street, West.* Plans and specifications may be seen and quantities obtained at the office of N. P. Pattinson, borough engineer, Town Hall. Tenders are to be sent in, sealed and endorsed "Tenders for Street Paving," on or before 2 p.m. on Sept. 25.

Sept. 26. Stapleford.—*Completion of Bailey Street and Wellington Street, in the parish of Stapleford*, for the R.D.C. Plans and specifications can be inspected at the office of F. R. Hawley, surveyor to the Council, situate at Wood Street, Ilkeston. Tenders, marked "Stapleford Streets," must be delivered to F. W. Fox, clerk to the Council, Bank Chambers, Beastmarket Hill, Nottingham, on or before Sept. 26.

Sept. 27. London, S.E.—*Supply of 12,000 superficial feet of new 2½in. York stone paving, "Silex" brand*, for the Lambeth Metropolitan Borough Council. Forms of tender can be obtained from H. Edwards, C.E., borough engineer, 346, Kennington Road, S.E. Sealed tenders, endorsed "Tender for York Stone Paving," must be delivered at the Town Hall not later than 12 o'clock noon on Sept. 27.

Sept. 27. Romford.—*Supply of 1,500 tons of Blue Guernsey Granite broken to 1½-in. cube*, for the U.D.C. The granite to be delivered free at Romford Station at such times and in such quantities as the Council may require before March 31, 1907. A contract and bond, with sufficient sureties, will have to be entered into and given by the person or persons whose tender may be accepted. Tenders (with samples, and marked "Tender for Granite") to be sent to C. T. King. Council Offices, Romford, on forms to be obtained from the Surveyor on or before Sept. 27.

Sept. 27. Ebbw Vale.—*Widening Libanus Road and the Approach Road to Sunny Bank Houses and Mount Pleasant Road* for the U.D.C. Plan and specification may be seen and form of tender, with bill of quantities, obtained by appointment at the office of T. J. Thomas, the town surveyor. A deposit of 10s., which must be made in postal orders, will be required from each person who obtains a copy of the form of tender and bill of quantities. Tenders, enclosed in a sealed envelope, endorsed on the outside "Tender for Libanus Road Improvement," must be delivered to T. Hughes, clerk, not later than Sept. 27.

Oct. 1. Reigate.—*Supply of about 100 tons of rough Rhenish basalt or Cherbourg quartzite*, delivered carriage paid at the Workhouse, near Earlswood Station (L. B. & S. C. Ry.). Persons tendering must state how soon the material can be delivered, and send samples of same to the Master at the Workhouse, Redhill, Surrey. Tenders to be delivered to F. C. Morrison, 46, High Street, Reigate, Surrey, in sealed envelopes, endorsed outside "Tender for Stone," on or before Oct. 1.

Oct. 1. Teddington.—*Following works in connection with the making up of Munster Road*, in the Parish of Teddington, for the U.D.C. :—3,862 sup. yds. of roadway forming and metalling, 1,015 lin. yds. of kerbing, 1,015 lin. yds. of channelling, 2,312 sup. yds. of tarpaving. Plans and specifications may be seen, bills of quantities and forms of tender obtained on payment of £2 2s., on application to M. Hainsworth, surveyor, Elmfield House, Teddington. Tenders will not be considered unless made out on the forms provided. Sealed tenders, endorsed "Private Street Works," must reach G. H. Salmons, clerk, Elmfield House, Teddington, not later than noon on Oct. 1.

Oct. 2. Lewisham. S.E.—*Kerbing, channelling, and metalling the roadway and paving the footpaths with artificial stone (in separate contracts) of Saravia Road, Lewisham.* The plans and specifications may be seen and forms of tender obtained at the Town Hall, Catford (Surveyor's Department). Copies of the specification may also be had on payment of the sum of 5s. in each case, which will not be returned. The tenders must be on forms issued by the Council, enclosed in an envelope, sealed and endorsed "Tender for Saravia Road," and must be delivered by 4 o'clock on Oct. 2, at the Town Hall, and placed in the box there provided for the purpose. The works must be proceeded with immediately on acceptance of tender and execution of contract, and the contractor must employ local labour as far as practicable in carrying out the work. Fair wages clause.

Oct. 4. Bromley.—*Works of sewering, levelling, paving, metalling, channelling and making good Hayes Road.* The works will include (about)—Excavation, 3,250 cubic yds. ; hardcore, 1,620 cubic yds. ; flints (pit), 1,330 cubic yds. ; kerb, Norway granite, 1,620 lineal yds. ; channel, New Guernsey setts, 260 lineal yds. ; channel, secondhand setts, 1,070 lineal yds. ; Burgess Hill brick paving, 2,970 super. yds. ; 2-in. Hayes gravel margins, 1,460 super. yds. Plans and sections may be seen, and specifications, bills of quanties, and forms of tender obtained, at the office of the Borough Engineer, Bromley, Kent (Municipal Offices, East Street), on payment of £1 1s. at the office of the Clerk of the Bromley Rural District Council, Park House, Beckenham Lane, Bromley, Kent. Tenders, endorsed "Tender for Hayes Road," must be delivered to the Clerk of the Bromley Rural District Council, at Park House aforesaid, not later than Oct. 4.

Nov. 8. Cape Town.—*Material and labour required for laying asphalt paving* in the carriage ways of Long Street and Darling Street (between Plein Street and Castle Bridge), and for the maintenance of the same in a perfect state of repair for a period of twelve months thereafter. The total area to be paved with asphalt is approximately 34,000 superficial yards, including the tramway tracks, and it is the intention of the Council to select several kinds of asphalt for testing purposes. The concrete foundations will be provided by the Council. Specification may be seen and forms of tender and full information obtained upon application at the Offices of Davis & Soper, Agents of the Corporation of the City of Cape Town, 54, St. Mary Axe, London, E.C. Tenders, under seal and endorsed "Tender for Asphalt Paving," must be delivered to Davis & Soper, not later than 4 o'clock p.m. on Nov. 8th, and samples not later than 4 o'clock p.m. on Nov. 1. No tender will be considered unless submitted on the official form.

SANITARY.

Sept. 24. Egypt. *Supply of sanitary fittings*, for the Stores Department of the Egyptian State Railways Administration, according to the schedule attached to the specification, copies of which may be obtained from Lieut.-Col. Western R.E., C.M.G., Queen Anne's Chambers, Westminster, London, S.W., on payment of 4s. each copy. Tenders, addressed to the general manager of the Egyptian State Railways, Cairo, will be received up to Sept. 24, and have to remain open for 40 days from that date. A copy of the specification may be seen at the offices of the Commercial Intelligence Branch of the Board of Trade, 73, Basinghall Street, London, E.C.

Sept. 24. Yardley.—*Provision and construction of the following foul-water sewers and drains* :—178yds. of 12-in. sewer in Stoney Lane, Coldbath ; 678yds of 12-in. sewer in Coldbath Road, Billesley ; 129yds. of 9-in. sewer in Coldbath Road, Billesley ; 699yds. of 9-in. sewer in Brook Lane ; 699 yds. of 9-in. sewer in Stoney Lane, Coldbath ; 67yds. of 9-in. sewer in Stoney Lane, Billesley ; 300yds. of 9-in. sewer in Windermere Road, Coldbath ; 195yds. of 9-in. sewer in Dyott Road, Wake Green ; 148yds. of 9-in. sewer in St Agnes Crescent, Wake Green; 312yds. of 9-in. sewer in St. Agnes Road, Wake Green ; 200yds. of 9-in, sewer in Hayfield Road, Wake Green ; together with manholes, flushing chambers, and other works appertaining thereto, in accordance with plans, drawings, specification, and conditions of contract, which may be seen on application to the Engineer and Surveyor, W. Smith, at the Council House, Sparkhill, near Birmingham, between the hours of 10 and 1, and 3 and 5 (Saturdays 10 and 1). Specification, bill of quantities, and form of tender can be obtained on payment of £3 3s. to F. L. Thompson, clerk to the Council, the Council House, Sparkhill, near Birmingham. Tenders, endorsed "Billesley Sewerage," to be addressed and delivered to the Clerk to the Council not later than noon on Sept. 24. Fair wages clause.

Sept. 27. Uxbridge.—*Providing, laying, and jointing of a stoneware pipe sewer in Long Lane, Hillingdon, the construction of manholes, and erection of ventilating columns* for the R.D.C. Plan and specification may be seen at the office of J. Freebairn Stow, engineer, Surveyor's Office, Corn Exchange, Uxbridge. Sealed tenders, endorsed "Long Lane Sewer," must be delivered at his office not later than 4 p.m. on Sept. 27.

MISCELLANEOUS.

Sept. 20. British India.—*Supply of the following stores : Bellows and Forges, bib-cocks, &c., anvils and vices, undressed waggon covers, steelwork and ironwork for waggons* for the Great Indian Peninsula Railway Company. Specifications and forms of tender may be obtained at the Company's offices, 48 Copthall Avenue, E.C., on payment of the fee for the specification. Tenders must be delivered in sealed envelopes, addressed to the Secretary, marked "Tender for Bellows and Forges," or as the case may be, not later than 11 a.m. on Sept. 20, 1906.

Sept. 20. Prescot. — *Ironmongery, timber, paint, builders' materials, and other articles.* Persons desirous of contracting with the Guardians of Prescot Union for the next six months for supplying the workhouse are requested to deliver sealed tenders, upon forms to be obtained of A. F. Mann, union clerk, Union Offices, Whiston, Prescot, on or before Sept. 20, before 10 a.m. Samples of the various articles may be seen at the workhouse before tendering. Such tenders will be opened at a meeting of the Guardians on the last named day. Security must be given, if required, for the due performance of the contracts.

Sept. 20. Rhondda.—Tenders are invited for the following works :—Contract No. 7.—Lead and compo pipe and block tin. Contract No. 8.—Wrought iron tubes and fittings. Contract No. 15.—Haulage at Pentre, Llwynypia and Porth. Contract No. 41.—Erection of boundary wall at Blaenclydach storage tank. Contract No. 42.—Repairing Cornish boiler at Porth gas works. Forms of tender for Contracts Nos. 7, 8 and 15 may be obtained on application. Plans and specifications may be seen for Contracts Nos. 41 and 42, and forms of tender supplied upon application to O. Thomas, the engineer and manager, gas and water offices, Pentre, Rhondda. upon depositing the sum of £1 1s. No form of tender other than that issued by the Council will be accepted. Fair wages clause. Tenders to be addressed to the Chairman of the Gas and Water Committee, endorsed "Contract No. 7, &c.," and delivered to W. P. Nicholas, clerk to the Council, Council Offices, Pentre, Rhondda, on or before 10 a.m. on Sept. 20.

Sept. 25. London, N.—*Supply and delivery at the Edmonton low-level or Angel Road Station of the Great Eastern Railway, or by barge at the Council's wharf on the river Lee navigation, of Portland cement*, as and when required by the Council, for the period between Sept. 29, 1906, and Sept. 30, 1907, for the U.D.C. Fair wages clause. Forms of tender and full particulars may be obtained of G. Eedes Eachus, engineer to the Council, Town Hall, Edmonton. Sealed tenders (which must be upon the form supplied by the Council's engineer), endorsed "Tender for Cement," to be delivered to W. F. Payne, clerk of the Council, Town Hall, Edmonton, not later than 12 o'clock noon on Sept. 25.

Sept. 25. London, N.—*Supply and delivery at the Edmonton low-level Station on the Great Eastern Railway or at the Town Hall yard (at the option of the Council) of stoneware pipes* for the six months ending March 31, 1907, for the Edmonton U.D.C. Forms of tender and full particulars may be obtained on application to G. Eedes Eachus, engineer to the Council, Town Hall, Edmonton. Fair wages clause. Persons tendering are requested to quote nett prices without trade discounts. Sealed tenders, which must be upon the form supplied by the Council's engineer, endorsed "Tender for Stoneware Pipes," to be delivered to W. F. Payne, clerk of the Council, Town Hall, Edmonton, not later than 12 o'clock noon on Sept. 25.

Sept. 25. Bombay.—*Supply of the following stores* :—Class A—1. Eyebolts and strand wire for fencing ; 2. Pillars, posts, &c., for fencing ; 3. Accumulator cells, &c. ; 4. Axles for carriages and wagons ; 5. India rubber fittings ; 6. Steel boiler tubes ; 7. Tyres for carriages ; 8. Tyres for engines ; 9. Cast steel engine wheel centres ; 10. Copper plates and rods ; 11. Brass boiler tubes. Class B—1. Panel plates. Class C—1. Tube ferrules. The Bombay-Baroda and Central India Railway Company are prepared to receive tenders up to noon on Sept. 25. Tenders must be made on forms, copies of which, with specifications, can be obtained at the offices of the Company, Gloucester House, 2, 3, and 4, Bishopsgate Street Without, London, E.C., on payment as follows :—For Class A, 21s. each, for Class B, 10s. 6d. each, and for Class C, 5s. each (which will not be returned).

Sept. 26. Aberdeen.—*Supplying for the ordinary harbour works, the following articles* for one year, from Nov. 1, 1906, to Oct. 31, 1907, inclusive :—Steel and iron, ironmongery, crane chains, cast-iron work, timber, plumber work, brass and copper work, india-rubber and asbestos, painter work, ropes and yarns, stones and road metal; bricks and drain pipes, oils, slates, carting and sand. All according to schedules, which will be delivered to intending contractors at the Harbour Engineer's Office. Sealed tenders, addressed to the Aberdeen Harbour Commissioners, and properly endorsed, are to be lodged with R. G. Nicol, harbour engineer, on or before Sept. 26.

TOO LATE FOR CLASSIFICATION.

Sept. 20. Tulloch.—*Mason, carpenter, slater, and plaster works of a dwelling house to be erected at the Blacksmith's Croft*, Tulloch, Oldmeldrum. Plans and specifications may be seen with the tenant and with J. Cobban, architect, Haddo House. Sealed tenders to be lodged with the architect, on Sept. 20 at 10 a.m.

Sept. 20. Torphins.—*Small extension of water main pipe at Torphins.* Plan and specification may be seen with and schedules of quantities obtained from Jenkins & Marr, C.E. and architects, 16, Bridge Street, Aberdeen, with whom offers are to be lodged by Sept. 20

Sept. 21. Arbuthnott.—(1) *Mason, carpenter and slater works for repairs* on the Farm Offices, &c., at Bridge End (Hodge), Arbuthnott, Fordoun. (2) Mason and Carpenter Works for making alterations on the Cattle Courts at Mains of Arbuthnott, Fordoun. (3) Carpenter and Slater Works for making repairs on the Farm House and Offices at Cluseburn (Archibald), Arbuthnott, Fordoun. Plans, specifications, and general conditions can be seen with the tenants, or with Davidson & Garden, 12, Dee Street, Aberdeen, with whom offers are to be lodged not later than Sept. 21.

Sept. 22. Withernsea.—*250 tons of 2-in. Macadam delivered at Withernsea Station*, also the price for the same tarred, for the U.D.C, Tenders to be delivered to F. J. Gardam, clerk to the Council, 16, Parliament Street, Hull, on or before Sept. 22, endorsed "Tender for Macadam."

Sept. 25. Stockton-on-Tees.—*Erection of a urinal in Bowesfield Lane.* Plans and specification may be seen, and further information obtained, at the Borough Engineer's Office, Town Hall, Stockton-on-Tees. Tenders, endorsed "Urinal," to be sent to A. B. Crosby, town clerk, Borough Hall, Stockton-on-Tees, not later than 10 a.m. on Sept. 25.

Sept. 27. Darlington.—*Painting, &c., the outside of the Fever Hospital.* Specification may be seen and bill of quantities obtained on application at the offices of G. Winter, borough surveyor, Town Hall. Tenders, endorsed "Tender for Painting at Hospital," to be sent to H. G. Stevenson, town clerk, on or before Sept. 27.

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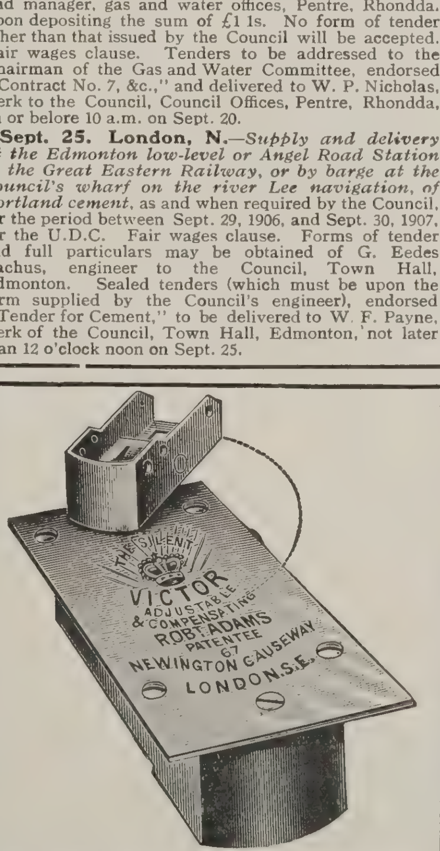

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Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, *Great New Street, Fetter Lane, E.C.*

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Barnoldswick.—For paving, sewering, &c., York, Wellington, and Commercial Streets, for the Barnoldswick U.D.C. Mr. W. Bennett, surveyor :—

W. J. J. McDonald, Barnoldswick	£1,127	8	8
W. Baker, Keighley	1,054	5	9
J. Green,* Burnley	1,029	14	7

* Accepted.

Caerphilly.—For the erection of a public slaughter-house and other contingent works at Taffs Well, for the Caerphilly U.D.C. Mr. A. O. Harpur, surveyor :—

D. Davies & Sons, Cardiff	£1,479	10	0
Hatherley & Co., Penarth	1,447	8	8
D. Davies, Cardiff	1,326	0	0
J. Ingleson, Merthyr	1,313	17	0
G. Griffiths, Cardiff	1,209	0	0
J. B. Mundy, Llandaff	1,136	8	0
C. C. Dunn, Cardiff	1,185	0	0
J. Pugh, Cardiff	1,082	10	5
W. H. Evans, Cardiff	1,175	0	0
J. E. Evans, Pontypridd	1,175	0	0
T. F. Howells, Caerphilly	1,140	0	0
D. W. Davies, Cardiff	1,199	0	0
J. Harry, Radyr, near Cardiff	1,128	11	5
E. R. Evans Bros., Cardiff	1,106	6	1
F. Bristow, Abertridwr	1,091	19	3
E. T. Bevan, Penarth	1,080	0	0
Smith, Jones, & Sons, Pontypridd	1,058	6	1
A. J. Rossiter, Caerphilly	1,012	4	4
T. Edwards, Taffs Well	1,010	11	4
J. Williams,* Abertridwr, near Caerphilly	887	13	4

* Accepted,

Caversham.—For alterations to existing works and the erection of additional septic tanks and continuous filters in connection with their sewage-disposal works, for the Caversham U.D.C. Mr. Alfred J. Smith, engineer and surveyor, 11, Bridge Street, Caversham :—

A. G. Osenton, Waterlooville, near Portsmouth	£13,551	16	6
Hardy, Bate & Co., Slough	12,548	14	6
Hewett & Sons, Barking	12,073	4	11
E. T. Jeffery, Maidstone	11,381	14	8
W. Moss & Sons, Loughborough	10,947	13	3
T. Vale & Sons, Stourport	10,693	11	2
H. Hill, Reading	10,259	6	7
J. Moran & Son, 9, Bridge St., S.W.	10,170	11	3
B. Cooke & Co., 77, Albert Bridge Road, S.W.	10,053	0	0
Bower Bros., 9, Fenchurch Street, E.C.	9,928	13	0
Chick & Carden, Highworth, Wilts	9,783	17	2
McC. E. Fitt, Reading (no schedule)	9,727	0	0
A. Faulks, Reading	9,665	12	9
H. W. Godwin, Reading	9,437	1	6
G. S. Lewis & Bro., Reading	9,297	0	0
A. Streeter & Co., Godalming	9,208	3	9
Collier & Catley,* St. Mary's Butts, Reading	8,483	1	2
H. Harris & Son, Marlow	8,425	17	0
G G. Rayner, Croydon (incomplete)	8,320	14	7
R. H. B. Neal, Ltd., Plymouth	8,090	8	11
T. H. Macdonald, Oxford	8,086	0	0

Surveyor's estimate, £8,771 17s. 6d.

* Accepted.

Liverpool.—Accepted for the erection of laundry buildings at Highfield Infirmary, Knotty Ash, for Liverpool Select Vestry. Messrs. Edmund Kirby and W. E. Willink, architects, 5, Cook Street, Liverpool :—

Ballen Bros. & Sons, 39, Almond Street	£5,908

Radstock.—For alterations and renovations to the Wells Way Inn for Messrs. Thatchers' Breweries, Ltd., Welton, Midsomer Norton. Mr, W. F. Bird, architect, Midsomer Norton, Somerset. Quantities by the architect :—

H. A. Forse & Sons, Bristol	£920	0	6
T. Foster, Radstock	916	0	0
W. G. Bindon, Bristol	880	0	0
W. & G. Bennett, Bristol	850	0	0
J. Hatherley, Bristol	757	0	0
A. E. Denby & Co., Bristol	675	0	0
J. Bird, Radstock	628	9	8
W. & Edgell, Westfield	599	0	0
W. J. Heal, High Littleton	597	7	6
W. A. Catley*, Midsomer Norton	552	0	0
G. Bishop, Bristol	470	0	0

* Accepted.

Radstock.—For alterations and additions to the riverside premises, for the Radstock Co-operative and Industrial Society. Mr. W. F. Bird, architect, Midsomer Norton, Somerset. Quantities by the architect :—

Wm. Webb, Bath	£1,845	0	0
H. A. Forse & Sons, Bristol	1,840	0	0
W. & J. Bennett, Bristol	1,620	0	0
A. E. Denby & Co., Bristol	1,599	0	0
W. J. Heal, High Littleton	1,598	0	0
A. T. Waterhouse, Radstock	1,583	17	0
E. C. Harvey, Bristol	1,459	19	0
W. Tovey, Midsomer Norton	1,410	0	0
J. Bird, Radstock	1,400	0	0
Thomas Foster,* Radstock	1,382	0	0

*Accepted.

South Shields.—For the permanent-way and track construction of tramways—Hudson Street and Boldon Lane extension—for the Tramways Committee. Mr. S. E. Burgess, M.I.C.E., borough engineer and surveyor:

J. L. Miller, North Shields	£5,543	8	6
A. Stark & Sons, Glasgow	5,259	15	11
W. Griffiths & Co., London, E.C.	4,703	4	5
W. Underwood & Bro.,* Hope Street, Dukinfield	4,330	3	6
G. Freeman & Sons, Hollinwood, Lancs.	4,071	9	3
T. C. Starkey, Hull	4,041	0	7

* Accepted.

Weston-super-Mare.—For the erection of Milton new infants' schools. Messrs. Hans Price and W. Jane, architects, Weston-super-Mare :—

H. A. Forse & Sons, Bristol	£2,440	0	0
A. G. Heard, Shirehampton, Bristol	2,360	0	0
E. Preece, Filton, Bristol	2,277	0	0
G. Pollard & Co., Taunton	2,148	0	0
C. Taylor, Weston-super-Mare	2,142	0	0
C. Addicott, Weston-super-Mare	2,110	0	0
G. Sprake, Milton	2,049	0	0
A. J. Colborne, Swindon	2,029	12	0
H. J. Fear & Sons, Milton	1,830	0	0
H. W. Pollard,* Bridgwater	1,749	0	0

* Accepted.

Partnerships.

Dissolutions of Partnerships.

[*The date when the partnership was dissolved is given in parenthesis where known.*]

EDMONDSON BROS., builders, Nelson (Dec. 30, 1905).

PEARSON & FLETCHER, painters and decorators, Morecambe (Aug. 17).

M. GLOYNE, builder and contractor, Willesden Green, N.W. (Aug. 31, 1904).

FOSTER & HOLLINGSWORTH, builders, Barnet (Sept. 5). Debts by E. P. Hollingsworth.

BAKER & TAYLOR, builders and contractors, Bristol (Aug. 21). Debts by W. H. Baker.

JEFFERY & PEACE, joiners, builders and undertakers, Batley (Aug. 7). Debts by J. R. Jeffery and H. Peace, who continue.

R. CUERDEN & SONS, plumbers, glaziers and gasfitters, Bolton (Sept. 1). Debts by D. Cuerden, who continues as Cuerden & Sons.

JOHNSON BROS., builders, contractors and undertakers, Cambridge (Aug. 8). Debts by E. Johnson, who continues as Ernest Johnson.

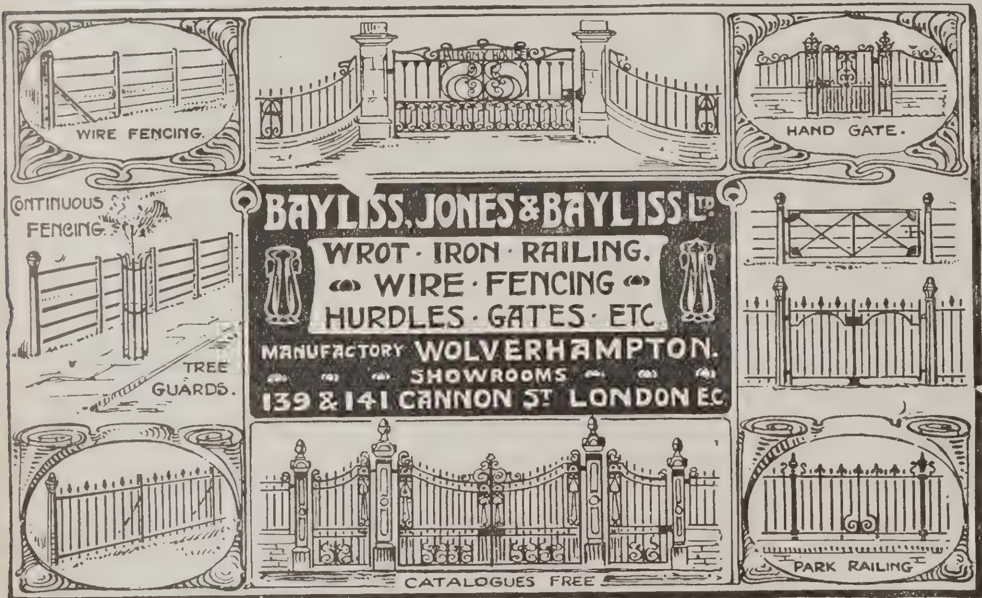
LEWIS & LAW, timber merchants and wood turners, Hartlepool (Aug. 17). Debts by H. Lewis, who continues as H. Lewis & Son.

BALDWIN & STANFORD, builders and contractors, Croydon (June 7). Debts by S. Baldwin, who continues as Sydney Baldwin.

W. H. FRY & CO., painters and decorators, Portsmouth (June 30). Debts by R. S. K. Hemsley and H. L. Brown, who continue.

H. LONGLEY & SONS, timber merchants, Haywards Heath and Rotherhithe, S.E. (March 25). Debts by H. Longley, Junr., and F. Longley, who continue.

G. BRADLEY & SONS, house painters, paperhangers, decorators, &c., Scarborough (Aug. 23, as regards E. E. Bradley, who will carry on business in his own name).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Coming Events.

Wednesday, Sept. 19.

INSTITUTE OF SANITARY ENGINEERS.—Opening Sessional Meeting, Holborn Restaurant, at 7.30 p.m.

PROVIDENT INSTITUTION OF BUILDERS' FOREMEN AND CLERKS OF WORKS.—Ordinary meeting at 8 p.m.

ROYAL SANITARY INSTITUTE,—Dr. G. Newman on "Duties of a Sanitary Inspector," at 7 p.m. (Second lecture.)

Friday, September 21.

ROYAL SANITARY INSTITUTE.—Dr. G. Newman on "Duties of a Sanitary Inspector," at 7 p.m. (Third lecture.)

Saturday, Sept. 22.

INSTITUTE OF SANITARY ENGINEERS.—Visit to Hampton Sewage Works.

JUNIOR INSTITUTION OF ENGINEERS.—Visit the Knight, Bevan & Sturge Portland Cement Works of the Associated Portland Cement Manufacturers. Train leaves Charing Cross at 1.25 p.m. for Northfleet.

Saturday, Sept. 29.

NORTHERN ARCHITECTURAL ASSOCIATION.—Students' Sketching Club Excursion.

INSTITUTE OF SANITARY ENGINEERS.—Visit to Engineering and Machinery Exhibition at Olympia.

Wednesday, October 3.

INSTITUTE OF SANITARY ENGINEERS.—Mr. W. Francis Goodrich on "The Romance of Waste."

Friday, Oct. 5.

ARCHITECTURAL ASSOCIATION.—Annual General Meeting. President's Address (R. S. Balfour) and Distribution of Prizes.

Bankruptcies.

Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—adjudication.

DURING THE WEEK ending Sept. 14th, twelve failures in the building and timber trades in England and Wales were gazetted.

G. LUCKETT, architect, Aylesbury. R.O., Sept. 3.

HEAL & CO., builders, Bournemouth. Adj., Sept. 3.

A. E. R. TURNER, painter and decorator, Blackburn. Adj., July 21.

T. HUGHES, carpenter and wheelwright, Peterstow. R.O., Sept. 8.

W. CROFT, carpenter, Sherborne. P.E., Town Hall, Yeovil, Oct 11, at 12.30.

H. SMITH, builder and monumental sculptor, Chester-le-Street. R.O., Sept. 4.

D. J. PHILLIPS, builder and contractor, Maesteg. P.E., Town Hall, Cardiff, Oct. 2, at 11.

E. CHAMBERS, journeyman joiner, Kimberley. P.E., Nottingham C.C., Oct. 5, at 10.30.

HAMER & HAMER, plasterers and painters, Bury. P.E., Bolton C.C., Sept. 26, at 3.30. R.O., Sept. 3.

E. LARKING, builder, Putney. First meeting, 132, York Road, S.E., Sept. 20, at 12.30. P.E., Wandsworth C.C., Oct. 25, at 12.

A. & J. W. ALDRIDGE, builders and contractors, London, N. Gross liabilities, £16,423; unsecured, £2,264; assets, £1,258. Trustee appointed to wind-up the estate in bankruptcy.

New Companies.

WHITEHAVEN PIPE AND BRICK CO., 36, King Street, Whitehaven, Cumberland. Capital: £13,000.

T. B. STABLEFORD, manufacturer of bricks, tiles, pipes, &c., Chellaston, near Derby. Capital: £2,000.

WESTINGHOUSE METAL FILAMENT LAMP CO., Westinghouse Building, Norfolk Street, W.C. Capital: £10,000.

ROBERT MCCALMONT & SONS, LTD., felt, tar, asphalt and roofing material manufacturers and merchants, Pitt Street, Belfast. Capital: £25,000.

F. H. ROSHER & CO., dealers in lime, cement, brick, and builders' merchants, 50, Haverstock Hill, Nelson Wharf, City Road and elsewhere. Capital: £5,000.

CHARLES SPRECKLEY & CO., shop-front builders, showcase and furniture manufacturers, &c., 21, Phœnix Place, Calthorpe Street, Gray's Inn Road, W.C. Capital: £5,000.

SAXILBY DEVELOPMEMT CO.—To acquire and turn to account any property in the United Kingdom or elsewhere, and to carry on the business of builders, surveyors, &c. Capital: £10,000.

HOUSEHOLD HEATH STONE PITS CO., LTD., to acquire the Rifle Range Gravel Pits at Thorpe, Norfolk, and to carry on the business of quarrymen, stone merchants, road and pavement contractors, A. B. C. Wharf, King Street, Norwich. Capital: £10,000.

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THE BUILDERS' JOURNAL
AND ARCHITECTURAL ENGINEER.

September 19, 1906.

CONTRACTORS' SUPPLEMENT (MONTHLY).

Labour Conditions Compared. AN article by Mr. Kennedy on "Labour Conditions in the United States" recently appeared in the "Daily Mail," in which certain points were raised which undoubtedly deserve attention. The author's sermon was intended to show how much better off the labourer is in England than in America. Mr. Kennedy overdrew the picture, but a good deal of what he said was true. In the building trade we are all familiar with the American driving system, which happily does not exist in this country. It has been tried here, and found to be a mistake. Mr. Kennedy first cites the case of the navvy in England. He calculates this class of workman to get from 5½d. to 6d. an hour, or about 4s. 7d. for a day of ten hours. In America, for the same kind of work a navvy gets from 6s. to 7s. a day. But the 4s. 7d. goes much further in England than the 7s. does in America, and this is the point of the argument. It may be taken as a fact that the American labourer gets no more benefit from his higher wages than the English labourer. Moreover, the American navvy has a very different life to the Englishman. He has to work much harder; the labour boss almost slave-drives him; so, in this, the English worker can consider himself better off than the American. We are not, however, prepared to substantiate Mr. Kennedy's contention that labour masters in America are heartless, while as regards the statement that there is no Workmen's Compensation Act in America we would point out that no such Act was in force in this country until quite recent years, and the insurance which contractors make against undue burden in this respect has led to little or no change in their treatment of the men. Some contractors in the United States may be callous, but such are to be found everywhere. We do not believe that the American contractor is so regardless to life and limb as Mr. Kennedy makes him out to be, but all those concerned in the building trades in England know how reckless the ordinary workman is. There certainly seems to be a tendency in the States to take more risks than we do in this country, and this recklessness of the individual should be considered before we assert that the excess of accidents in the States is traceable to the contractor. In a previous "Contractors' Supplement" Mr. Macfarlane, of Manchester, called attention to the improved conditions under which the modern carpenter and joiner works compared with those of fifty years ago, and although the worker in the United States is required to keep up a good pace he has every aid in the saving of manual labour which modern machinery can give. It is no doubt one of the features of American work in every department that they go to excess and are worked up to such a pitch that they make work for each other, whereas just as much and more (and better) work can be done quietly in the same time by Englishmen. The workers, however, in England have gone quite far enough in their shortening of the hours of labour and the slackening of the rate of work, resulting in what has been called the "Ca'canny" principle, and we do not think that conditions of labour in England, though much better for the worker, can be held up as an example to American employers and statesmen of what to follow. There is no doubt the Americans would do better to take things easier, but in manual labour the American worker is by no means a slave.

A Reform Needed in Sub-Contracts. THE present system of dealing with sub-contractors is subject to some abuse. It is admittedly difficult to control sub-contractors, and if the architect requires the general contractor to give some surety, the contractor naturally—in dealing with the sub-contractors upon whom he, in turn, has to rely—desires to have some guarantee that their work should be thoroughly reliable and in conformity with the terms of the contract. The architect secures some reliability in the work of the contractor by stipulating in the general conditions for money to be retained until the completion of the job, or a stated period after. This means that the contractor has to lock up a good deal of money on a large job, and he usually obtains this money as a loan from bankers or others, upon which interest must be paid. Very few contractors could afford to wait until the completion of a job before receiving any payment at all, and they obtain draws on the certificates of the architects granted during the progress of the work. The certificates, of course, always amount to less than the value of the work actually done at any moment. As it is difficult for the architect to be very certain of the amount actually done throughout the progress of any job, much more money is kept back than actually should be under the terms of the contract. Of course, as soon as the job is finished. the contractor gets paid the correct percentage of the full payment, the remainder being the final retention money. The sub-contractors in practice, as recognised in the "Sub-contract of Building Work" issued by the Institute of Builders, are entitled to the same rate of payment as the general contractors. It is expressly stated that the final balance shall only be payable as, and when, the contractors receive their final payment. This is all very well in the majority of cases where the sub-contractors come upon a building towards the end of the job, such, for instance, as installing the lifts, supplying the joinery, partitions, plastering, marble work and painting, glazing and other finishings, because their work becomes completed approximately at the same time as the general contractors, and they are all in the same boat as regards the final payment from the building owner, but with several other trades it is obvious that the sub-contractor can be unfairly treated, and even if he goes into the job with his eyes open, it is an illogical state of affairs. For instance, supposing that the foundations are let to a sub-contractor. These are completed early in the course of a large building job. It may be a year or two years after the foundations are constructed before the job is finally completed. When the building is finished, the contractor, we will assume, has to wait six months before the final certificate is issued. If we apply the same period of time to the foundation work it is plain that the sub-contractor who did this part of the work should have been paid in full long before the rest of the building was finished; yet he would be obliged to wait until the final certificate before he received his payment in full. This means that he would be paying for the interest on the money borrowed or invested in the job by the general contractor. Of course, in the matter of foundations it may be argued that until the building is finally completed, and six months have passed, defects in the foundations will not become apparent, but it is plain that it will be too late then to remedy such defects without exceeding the retention money. Small cracks, it is true, might require to be remedied, but any serious defects would entail a great amount of work, if not partial rebuilding. The importance of the foundations being well built has been recognised, and particular attention is always paid to seeing that such work is properly executed. Where the supervision is strict there is no necessity to wait for time to prove that the sub-contractors have done their work properly, and they should not be kept out of their money in the way referred to. The same thing applies to sub-contractors who carry out other important constructional work in a building such as the steel construction, concrete floors and stonework, and even the same principle applies with less force to work which is done late in the erection of a building. Such a system, if it becomes common in contracts, will mean that only firms of large capital can enter into building operations. Not only should the general contractors have substantial capital, but the sub-contractors also. There is little doubt that this feature of modern contracting is not only illogical, but has disadvantages in the way of preventing enterprise. Undoubtedly the system is much more harmful where building operations are on an enormous scale, such as in the United States. There the steel buildings can only be executed by comparatively few firms, who sublet the work to an extent beyond anything we have yet seen in this country. There this feature of contract work is a considerable evil, and we need to take care that it does not grow to be one with us. It, fortunately, has not yet got a hold on the building trade in this country, for architects generally limit the sub-contractors, with whom they deal direct, and to whom they grant special certificates for presentation to the general contractor immediately their work is completed, and the other sub-contractors generally being labour men, are of small capital and must be paid up close.

The Month's Trade

Reports by our Special Correspondents.

THE STONE, GRANITE AND MARBLE TRADES.

In these trades the improvement which was shown in the previous month continued last month, except as regards the granite industry, which still continued to be very quiet and, if anything, worse than a year ago. The limestone and sandstone quarries were better employed than a month and a year ago. This very small improvement has continued now for a few months, and it is evident that trade is gradually improving.

The returns for imports of stones, slabs and marble, rough, hewn and manufactured, for the month of August, 1906, as compared with the same month in 1904 and 1905, are as follows:—

Tons.			Value.		
1904.	1905.	1906.	1904.	1905.	1906.
104,548	93,244	108,243	£109,757	£103,608	£115,935

THE CLAY-WORKING INDUSTRY.

The slight improvement that has now been noticeable for the last three months in the brick and tile trades happily still continues. After such a depression as these trades have been through, it is only natural to expect the employment can only be called moderate, but the fact that it is better than a month ago and a year ago is all that we could legitimately wish for. Last month we stated that it seemed that the continuance of the improved state of affairs points to the improvement being more than a seasonable one, and the addition of another month to the record tends to confirm this supposition, and nothing at the moment seems to disturb the promise of brighter things.

The brick trade at Manchester is prosperous. The local brickworks seem hardly capable of coping with the demand for common bricks which realise £1 per 1,000, although all are in full working order. It is estimated that the year's output will amount to 200,000,000 bricks.

Some of the Fletton firms are doing good business. It is stated that the London Brick Co. has just secured the contract for 4½ million bricks for the new Muswell Hill Reservoir, and a second one of six million for the G.N. Railway extension from Enfield to Welwyn. At no period of the year has trade in the Peterborough district been brisker than during August.

THE PORTLAND CEMENT TRADE.

Although as is usual at this season of the year demand has shown some slight signs of slackening in the home section, manufacturers are holding to the recently advanced prices, for they are convinced that the volume of trade in this country is going to rapidly increase at an early date, while the pressure to supply for export is as great as it was two or three months ago. It is now the opinion of those best able to judge that the use of Portland cement not only in this country but throughout the world is expanding very rapidly, and although, as is usual under such conditions, every effort will doubtless be made to increase supplies, yet it must be a long time before the output of new mills is available. Meanwhile, prices even at the advanced level are very considerably below quotations of a few years ago, and so long as manufacturers are content with a fair margin of profit they will not find buyers unwilling to meet the changed position. It should also be borne in mind that the recent improvement in prices only brings them to the level of a year ago, while owing to the rise in the price of many articles which enter into the cost of manufacturing cement, we doubt whether the manufacturer will find that he has increased his margin to any material extent. On the whole the market for Portland cement may be considered in a healthy state with a prospect of future improvement.

The returns of imports and exports of cement for building and engineering purposes for August, 1906, as compared with the same month in 1904 and 1905 are as follows:—

IMPORTS.

	1904.	1905.	1906.
Tons - -	24,499	22,912	14,382
Value - -	£35,171	29,172	18,560

EXPORTS.

	1904.	1905.	1906.
Tons - -	32,090	39,403	68,075
Value - -	£52,729	62,625	102,058

The report of the directors of the Associated Portland Cement Manufacturers (1900), Limited, for the year to June 30th last, which is to be submitted to the shareholders at the seventh ordinary general meeting of the company to be held to-day, shows a profit of £335,462, after deductions, including £110,334 for repairs and renewals, which, with the balance brought forward from last year of £13,187, amounts to £348,649. After deducting managing directors' remuneration and directors' and trustees' fees, £17,198; debenture stock, mortgage and other interest, £137,512; sinking funds, depreciation and reserves, £33,502; and bad debts reserve, £4,000, the directors recommend the payment of a final dividend on the preference shares at the rate of 5½ per cent. per annum, leaving £12,552 to be carried forward. It is stated that the profits of the sixth year of the company's working should have shown an increase, through various economies that have been effected in the manufacturing department, but the fall in the selling price of Portland cement, which continued until quite recently, has, unfortunately, more than counterbalanced those economies. It is recommended that a sum of £25,000 be carried to the general reserve and depreciation account as was done last year. That account will then amount to £120,000. The total charge for the year for sinking funds, depreciation and reserve (including the amount written off patents, but exclusive of the reserve for bad debts) would then be £58,502 9s. 9d. The total amount of debenture stock purchased by the trustees under the provisions of the trust deed has been increased during the year by £15,564. It now stands at £78,449. The company's 4½ per cent. debenture stock has been increased by the further issue of £32,400, the proceeds of which have been employed in replacing working capital which had been used to reduce the mortgage indebtedness. From this source, from sales of property, and from revenue, the total reduction, for the year, of mortgage indebtedness is £57,100.

The Belgian Consul at Manila, in the Philippines, states that large quantities of Portland cement will be required in the construction of new railways for which concessions have recently been granted. It is said that the concessionaires propose to invite public tenders for the supply of the cement needed.

THE IRON AND STEEL TRADES.

We had last month to report a period of monotony and dulness; the past four weeks have shown a better record. Things have improved and prices are up to their former level. The demand for structural steelwork is sluggish, it is true, but steelmakers have plenty of orders from other sources, such as the shipbuilding trade, railways, &c., and the prices for joists, angles, tees and other shapes used in building work have advanced. Whereas the price of Staffordshire common iron bars was quoted at £6 5s. in our last issue of the "Contractors' Supplement," they are now fetching £6 10s. to £6 15s. All departments of finished iron in the Birmingham district show an unusual steadiness. The demand for common bars and the best bars is good, but medium qualities are somewhat slack.

Corrugated sheets have difficulty in maintaining the figure they reached last month, but the present prices cannot be grumbled at.

Trade in structural shapes in Lancashire has continued good. The demand is steady and prices indeed show an upward tendency.

As regards Scotland, the absence of German competition and the continuance of a steady flow of orders has kept all the works fully employed, and prices have been maintained. The orders have, it is true, not been coming in quite at a rate equal to the output. No conclusion can be drawn from this at present.

In the North of England improvement in manufactured iron and steel and in pig-iron has been noticeable. Prices are steady again and are likely to advance.

As regards Continental material both America and Germany are full up with home orders. In fact, the latest reports go to show that manufacturers in the States will be unable to cope with their home demands and that orders may be placed in this country for structural steelwork. At any rate, both Germany and the United States leave us alone to take orders in the colonies and abroad and to supply our own market. Belgium still continues to take orders for structural steel for export at a low figure, but the steelworks are busy and everyone seems to be expecting a substantial rise in prices.

OTHER METALS.

The copper market continues strong. Prices are well maintained, and there has been something like a scramble for material for early deliveries. American advices tend to show that the consumption of copper in the United States for the present year is 20 per cent. larger than last year, whereas the output of the mines is only 6 per cent. In Germany and other European countries the consumption is considered to be larger. No wonder then that prices should be so high.

Lead has undergone increased demand and prices have still further hardened on last month.

Tin has also undergone a rise in price, though it is not so inflated as it has been.

THE TIMBER TRADE.

London Market in August.

There was some improvement in the volume of wood business in London during August. The dock deliveries still show a shortage of 2,300 standards as compared with August last year, but the overside deliveries more than counterbalance this with an improvement of 2,800 standards. The decrease for the eight months, however, as compared with the same period of 1905, averages more than 2,500 standards a month. Messrs. Churchill & Sim state that the stock now scattered amongst the three dock companies may be roughly estimated at nearly 20,000 standards less than last year. The month's importation has been a large one of deals and a small one of battens and boards. A considerable business has been effected (with a good deal of difficulty) for further goods for autumn shipment from Sweden and Russia, and a great deal more has been fruitlessly negotiated for on account of the extreme divergence of views as to prices between shippers and buyers. Shippers have continued on the lines of a very successful policy, easing off prices for unsaleable sizes and raising them continuously for the many dimensions which are in demand, so that more than one sale was effected during the month with deals and battens of the same quality at an all-over price. Buyers find it hard to follow all this with a wood trade still lagging behind the general trade of this and other countries. In many cases they have preferred to leave business alone altogether rather than pay prices on which they can see no immediate profit. They have proved too timid all through the season in this respect, and as prices gradually increase they naturally become less inclined to reverse their policy. Freights continue easily available with something less than the usual autumnal tendency to an increase of rates.

The abstract of dock stock, consumption, &c., for August, published by Messrs Foy, Morgan & Co., is given in the table at the foot of this page.

Dock Stock.

The stock of wood in the public docks on August 31st was:—

	Pieces.
Foreign deals and ends - - -	1,625,000
Do. battens - - - -	1,778,000
Pine deals and battens - - -	731,000
Spruce do. do. - - -	705,000
Boards, rough - - - -	3,108,000
Do. prepared - - -	6,534,000

totalling 14,481,000 pieces, as against 16,615,000 in 1905, 18,284,000 in 1904, and 18,466,000 in 1903.

In other kinds the stock was as follows:—

Foreign wainscot logs - -	269 pieces.
Do. oak timber - -	663 loads.
Do. fir timber - -	5,016 do.
Do. Oregon pine, &c., spars and masts - -	4,627 do.
Colonial oak timber - -	906 do.
Do. birch timber and planks -	6,250 do.
Do. elm and ash timber -	892 do.
Do. yellow pine - -	807 do.
Do. red pine - - -	32 do.
United States pitch-pine timber	18,424 do.
Do. do. deals -	130,000 pieces.
East India teak - - -	7,152 loads.

Deliveries.

The deliveries have been—

	First eight months. Pieces.	August. Pieces.
Foreign deals and ends -	2,041,000	223,000
Do. battens - -	3,310,000	316,000
Pine deals and battens -	657,000	49,000
Spruce do. do. -	733,000	65,000
Boards, rough - -	3,260,000	304,000
Do. prepared - -	9,004,000	994,000
Total - -	19,005,000	1,951,000

The deliveries direct from ship to craft have been—

	First eight months. P.s.h.	August. P.s.h.
Deals and battens - -	72,651	18,658
Boards - - -	15,191	2,848
Total - -	87,842	21,506

Soft Woods.

Swedish Deals and Battens.—The supply of deals has been larger than it was in August last year, and it continues to be a hard task to maintain prices for them in the London market. Of battens the supply has been short, and rates have again risen. Of prepared boards the importation was a very small one indeed during August. Prices have been quite firm, and perhaps a point higher than they were in July, but the market for them has hardly responded sufficiently to the probabilities of the situation. For shipment some nominally cheap sales of deals have been made, well under current quotations. These seemed to have cleared the air, and the tendency is now towards firmness again. For Swedish whitewood also there have been signs that the limit of advancing prices has been reached for the time, and is hardly likely to be exceeded during the autumn.

Norwegian Boards.—There was a full supply of prepared boards from Norway during the month. They were much wanted, and, in the absence of the usual quantities from Sweden, prices were better than in July.

Russian Deals.—The importation from Russian ports into London was a large one throughout August—of deals nearly double that of last year, and of battens also considerable. Prices for the former have been difficult to maintain, but the battens have come to a welcome market, supplementing the deficiencies of the Swedish supplies, and rates for them were better than in July. For shipment the August business was quite a small one. The quantities available are much below an average, and, knowing this, shippers are inclined to hold rather more than firmly, but buyers are indifferent and decline business.

Finnish Battens.—The August importation of battens was very short indeed, not much more than half that of August last year. Prices advanced generally during the month, and for the favourite small sizes a high level was attained, from which, however, they seem more likely to go forward than backward during the autumn and winter.

Prussian Timber.—A considerable supply of fir timber was brought in during August to London at prices which compare favourably with the existing rates of pitch-pine, but it seems to have gone so completely out of fashion that it has been neglected in the Dock ponds, and the cheaper quotations fail to tempt consumers. For foreign oak also the demand has been unsatisfactory, the high level of cost in this case supplying the reason.

Canadian Timber.—There was almost a cessation of pine deals arriving in London during August. The market remains very dead at a very high level of price, which there is not business enough to disturb one way or the other. It is governed by questions of supply and demand on the other side of the Atlantic, with which we have very little to do. Of spruce deals there has been a full arrival from the St. Lawrence, but a complete shortage from the New Brunswick and Nova Scotian ports. Business has been again difficult at shippers' ideas of value, and for the time being stocks are held for more than buyers will yet pay. There is a better demand about for birch timber and planks, for which the values have been very depressed by the large quantities imported, but which are now showing an inclination to turn the corner. For elm and ash there is no change in the market situation or in quotations. For oak and for yellow pine timber the position has turned rather in favour of buyers. The market for sawn pitch pine timber was an interesting one during August. The slight decline in values at the shipping ports in June and July brought in buyers, and considerable sales were effected for very various destinations at rapidly increasing prices. Rates are now very high again, and buyers still unsatisfied; but the volume of business is checked for the time by lack of further supplies at any level on which they dare venture. Of pitch pine deals the supply has been something more than normal of late though chiefly in common qualities. Prices which were so largely inflated by the previous cessation of supplies are now tending towards a more reasonable level.

Hard Woods.

Teak.—Messrs. Denny, Mott & Dickson, Ltd., report that the landings in the docks in London during August consisted of 205 loads of logs and 95 loads of planks and scantlings, or a total of 300 loads, as against 957 loads for the corresponding month of last year. The deliveries into consumption were 489 loads of logs and 251 loads of planks and scantlings—together 740 loads, as against 387 loads for August, 1905. The figures indicate clearly the restricted state of the market. Prices nevertheless have again stiffened, owing to the requirements at the shipbuilding rivers absorbing most of the available floating supplies, whilst advices from Burmah and Siam continue to point to this season's

Abstract of Stock, Consumption, &c., in London Docks, for August.

All Docks.	Deals (Fir).	Battens (Fir).	Pine.	Spruce.	Pitch-pine Deals.	Deals and Battens in Aggregate.	Rough Boards (All Countries).	Flooring.	Floated Timber.
	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Pieces	Pieces.	Pieces.	Loads.
Public dock stock - - -	1,332,048	2,066,618	730,293	704,729	81,832	4,915,520	3,155,100	6,534,146	28,500
Monthly public dock consumption - - - -	214,891	375,895	59,290	71,778	2,251	724,105	331,883	1,089,080	2,568
Overside stock - - -	769,310	1,345,704	212,258	256,965	—	2,584,237	1,188,141	642,557	—
Overside consumption (estimated of dock):— 98 per cent. Sawn 63 „ Planed	210,593	368,377	58,104	70,342	—	707,416	325,245	686,120	—
Duration of supply at same rate of consumption - -	4·94 months.	4·58 months.	8·03 months.	6·77 months.	36·35 months.	5·24 months.	6·61 months.	4·04 months.	11·10 months.

supplies from the forests being disappointly small. The position will be clearer towards the close of the year.

Mahogany.—This market has been very restricted, owing to the short supplies. Prices have stiffened, owing to the very small stocks; but now that Honduras shipments are coming into sight, and the African supplies also promising to be appreciable, broader all round business should mark the remainder of the year.

Our Consul at Valdivia, Chile, reports that owing to the high price of timber at this town saw mills have been established in the district and there have consequently been some enquiries for engines and saw mills.

Our Consul at Chiengrai, Siam, reports that there is much excellent timber *other than teak* in the new province of Muang, on the felling of which, as is the case throughout Siam, no restriction is placed by the Siamese Government. Large numbers of valuable trees are constantly burned by the hill tribes in making their plantations. At present there is an entire lack of any persons who make a business of either felling or sawing timber, which is consequently difficult to obtain; so much that the local authorities have up to now been unable to commence the new Government buildings, for which funds were sanctioned some time back.

THE WALLPAPER TRADE.

The wallpaper trade shows little or no movement. The Board of Trade returns of exports and imports for the eight months of this year ending August 31st show that the importation of paperhangings is slightly larger than last year; the exports have also improved little, as compared with 1904, but distinctly better than last year.

The following is the return of paperhangings for August:—

IMPORTS.

	1904.	1905.	1906.
Cwts. - -	—	1,627	1,938
Value - -	—	£4,916	6,189

EXPORTS.

	1904.	1905.	1906.
Cwts. - -	5,565	4,894	6,851
Value - -	£12,821	12,361	15,552

THE PAINT TRADES.

The paint trades continue fair. As regards materials, the returns for imports and exports for August, 1906, as compared with the same month in 1904 and 1905, are as follows:—

IMPORTS.

	Cwts.			Value.		
	1904.	1905.	1906.	1904.	1905.	1906.
White lead - - - - - - - -	24.185	24,940	24,306	£18,919	19,970	22,666
Zinc oxide - - - - - - -	125,533	25,461	20,962	88,835	24,050	23,389
Other colours and pigments - - - - - -		125,998	158,945		78,371	85,699
Turpentine - - - - - - - -	58,975	117,852	40,144	109,149	250,185	83,156
Lac-dye, seedlac, shellac and sticklac - - - -	9,491	8,680	4,862	78,194	68,315	43,931
		Tons.				
Linseed oil - - - - - - - -	189	407	667	3,715	7,656	13,303

EXPORTS.

	Cwts.			Value.		
White lead - - - - - - - -	28,149	29.551	29,943	26,829	27,963	31,200
Zinc oxide - - - - - - -	125,202	5.888	5,942	140,720	6,972	6,897
Other colours and pigments - - - - - -		115,533	116,814		137,675	146,633
		Tons.				
Linseed oil - - - - - - - -	2,769	2,130	1,984	51,963	43,956	46,259

THE GLASS TRADE.

The glass trade continues fair.

The returns for imports and exports of glass for the month of August, 1906, as compared with the same month in 1904 and 1905, are as follows:—

IMPORTS.

	Cwts.			Value.		
	1904.	1905.	1906.	1904.	1905.	1906.
Window and German Sheet, including shades and cylinders	82,943	122,453	103,736	£50,970	73,903	59,932
Plate - - - - - - - -	46,981	31,291	39,073	55,263	40,895	51,271

EXPORTS.

	Cwts.			Value.		
Plate - - - - - - - -	6,643	9,939	9,703	11,389	12,516	14,648

Our Consul at Nagasaki reports a noticeable increase in the import of glass at that port last year. It is due, he says, to the growing use by the Japanese of window glass for their houses. Most of it is of the fourth quality, and Belgium is the chief source of supply.

Builders' Notes.

A building trades' exhibition at Newcastle-on-Tyne was opened on Saturday last.

Gloucester Joinery Co., Limited.—The sixth annual report of this company states that the nett profits for the past year allow a dividend of 7 per cent. free of income tax, and placing £40 to the reserve fund.

Fall of a Girder: Fatal Accident.—While alterations were being carried out in a jeweller's shop in Great Market Place, Nottingham, last week, a heavy girder fell upon one of the labourers, who was so severely injured that he died soon afterwards.

Trade Unions Parliamentary Committee.—The only representative of the building trades on this committee, appointed at the recent Trade Union Congress at Liverpool, is Mr. F. Chandler (Carpenters and Joiners). In all, the committee comprises twelve members.

Manchester Bricklayers' Dispute.—A dispute has occurred between Messrs. Robert Neill & Sons, contractors, and the bricklayers employed by them on the new infirmary at Blackley. The men asked for an allowance for the time occupied in getting to their work, and, being refused, struck work. The society has also withdrawn their bricklayers from other works in which the firm in question are engaged.

Condition of Dantzig Building Trade.—Our Consul remarks on the activity shown in the building trade in the Dantzig district. Building materials, such as stone, cement, firebrick, tar, pitch, and roofing materials were imported into Dantzig in 1905 in large quantities both from the interior and by sea; 2,018 tons of asphalt, 782 tons of firebrick, 216 tons of fireclay goods, 182 tons of stone, 605 tons of tar, and 100 tons of pitch coming from the United Kingdom. Most of the cement for building, brought by sea, came from Pomerania, which sent 15,703 tons; most of the stone came from Sweden and Norway, which sent 50,038 tons.

Building in Coventry is brisk. Since the beginning of last year much ground in the city has been covered with houses, and hundreds are in course of erection. On all sides land is being rapidly developed and the new dwellings occupied as soon as habitable.

Scottish Building Trade.—The twelfth annual general meeting of the Scottish Building Trades Federation was held in Edinburgh on September 7th, Mr. Patrick Knox (president) occupying the chair. Reports were presented as to the state of trade in the different places. These indicated that the building trade was in a very depressed condition generally. Office-bearers for the ensuing year were elected, Mr. Patrick Knox, of Edinburgh, being re-elected president. It was decided that the headquarters of the Federation should be permanently fixed in Edinburgh. The date of the half-yearly meeting of the executive was fixed for April next year, and the next annual meeting it was decided should be held in Dundee in September next.

Rapid Reconstruction of a Brick Chimney.—A very rapid piece of reconstruction work has been done on a brick chimney which was damaged by lightning at Elizabeth, N.J. The chimney was 90ft. high, of radial brick construction. The base was square, and the upper 65ft. was built circular, and had on the top a cast-iron ring. This iron ring was struck by lightning and split. A jagged hole was also torn out of the side of the chimney about 40ft. from the top. Repairs were at once commenced, and the upper portion of the stack was quickly taken down. Five days after the damage had been committed the bricks for the renewal arrived, and reconstruction was commenced. In three days more the work was completed and steam was raised in the boilers. The stack was struck on July 4th, and on July 13th the reconstruction was completed.

A Crane Accident.—On September 7th an inquest was held on the body of a man named Bryce who was killed by a crane accident at the works of his employers, Messrs. George Jones, Ltd., of Lionel Street, Birmingham. The accident was due to the breaking of the crane hook. A cast-iron plate weighing 59cwts. was being hoisted by the crane (a 20-ton electric travelling one), and after being raised about 2ft. from the ground the hook gave way and the plate fell on three men, one of whom, Bryce, died from the result of the injuries he received. At the inquest the foreman ironmoulder of the works said that the ordinary weight lifted by the hook was a 50-cwt. ladle, but 12 tons could be attached to it with safety. The plate in question had been lifted with the hook a few weeks previously. The hook had been in use for about 15 years, but had not been used for any specially heavy work since 1894. Mr. Henry Lea, M.I.C.E., gave evidence to the effect that he had examined the hook and found that in the lowest part, where there was the greatest tensile stress, a patch of crystallised iron existed, which would much lessen the lifting capacity of the hook. Such crystallisation might have existed when the hook was made, or it might have developed as a result of vibration. In reply to the coroner, witness said it was a very good precaution to put hooks periodically in a furnace. The jury returned a verdict of accidental death.

Current Rates of Wages in Large Centres.

Towns.	Masons.	Bricklayers.	Carpenters and Joiners.	Plasterers.	Slaters.	Plumbers.	Painters.	Labourers.
	d.	d.	d.	d.	d.	d.	d.	d.
Aberdeen - -	8	—	8	8	8	8	8	4½–5½
Accrington -	9	9	8½	9	7½	8½	—	5–5½
Ashton - under Lyne - -	9½	10	9	10	8½	9	8	5½–6½
Barnsley - -	9	9	8½	9	8½	8	8	6½
Barrow-in-Furness - -	9	9	8¾	9	9	8¼	8¼	6–6½
Bath - -	7½	7½	7½	7½	7½	6½ 7½	6½	5–5½
Belfast - -	8½	8½	8½	8¾	8	8½	8	19s.wk
Birkenhead -	9½–10	9½	9½	9½	9	9½	8½	5–6½
Birmingham -	10–10¾	9½	9½	10	9	9½	8½	6½–7
Blackburn -	9½	10	9	9	9	9	8	5½–6½
Blackpool -	9¾	9½	8½	9½	8½	9	8½	5½–6
Bolton - -	9½	10	9½	10½	9	9	8½	6½–7
Bournemouth -	8½	8	8	8	8	8	7½	5½
Bradord - -	9	9	8½	8½	9	9	8	6–6½
Brighton - -	9	8	8	8	8	9	7	5½
Bristol - -	9	9	9	9	9	9	8½	6–6½
Burnley - -	—	—	8½	—	—	—	—	—
Burton-on-Trent	8½	8½	8½	—	—	—	—	5¾–6
Bury - - -	9½	10	9½	9	9	9	8½	5–6½
Cambridge -	8½	8	8	8½	8	8½	6½	5–5½
Cardiff - -	9	9	9	9	9	9	8½	5½
Carlisle - -	8½	8½	8	8	9	8	8	5–5½
Chatham - -	9	9	8½	9	10	8½	7	5½
Cheltenham	8–8½	8	8	7¾	—	8	7½	5
Chester - -	9	9	8½	9	9	8½	7½	5–5¾
Coatbridge and Airdrie - -	9½	9½	9	9½	9	8½	9	6
Colchester -	8	8	8	9	8.	9	6 6½	5–5½
Cork - - -	7⅔	7⅔	7⅔	7⅔	7⅔	8	8	3⅝
Coventry - -	9¼	8¾	9	8¾	8¾	9	8	6
Crewe - -	8½	8	7	9	8	8	7	5
Darlington -	9	9	8½	9	9½	8	7½	6
Darwen - -	9½	9½	9	9	9	9	8¼	6
Derby - -	9	9	8½	9	9	8½	7½	5½–6
Dublin - -	8–8½	8½	8–8½	8	8	8½	7½	4¼–4½
Dudley - -	8½	8	8	8½	8½	9	7	5½
Dundee - -	8–8½	10	9	8½	8½	8½	8½	5¼–5½
Eastbourne -	8½	8	8	9	pce.	8	7½	5½
Edinburgh -	8½	9½	9	—	—	9	—	—
Exeter - -	8	8	7½	7½	7½	7½	6½	5
Glasgow - -	—	9½	9½	9½	9	9	9	5½–6
Gloucester -	7½	8	8	7½	7½	8	7½	5
Greenock - -	9½	10	9	9½	9½	9	9	5½
Grimsby - -	—	9	8	9	pce.	—	7½	6–7
Halifax - -	9	9	8¼	8½	8½	8½	7½	6
Hartlepools -	9½–10	10	9¼	9½	—	—	—	7–7½
Hastings and St. Leonards.	8	8	8	8	—	8	7	5½–6
Huddersfield -	9	9	11	8½	9	7½ 8	7½	6
Hull - - -	9¼–9¾	9	9	9	9	9	8	6½–7
Ipswich - -	8	8	8	9	9	8	7½	5–5½
Keighley - -	8½	8½	8	7½	8½	7½	7½	6
Lancaster -	9½	10	8½	9	9	8	8½	5½–6
Leeds - -	9½	9½	9½	9	8½	9	8	6½–7
Leicester - -	9	9	9	10	9	9	8	6–6½
Leigh - -	9½	9½	9½	9	8½	9	8	6–6½
Lincoln - -	8½	8	8	9	8	8	7½	5–6
Liverpool -	9½–10	9½	9½	9½	9½	9½	8½	5–6
London - -	10½	10½	10½	11	—	11	—	—
Londonderry -	7	7	7	7	6½	7	7½	15s.wk.
Macclesfield -	8	8	8	7¾	6½	7½	7½	5
Manchester -	9½–10	10	9½	10	9	9½	8¾	5½–7
Merthyr Tydfil	8½	8½	8	8½	8	8	7½	5½
Middlesbrough	9	9½	9¼	9½	9½	9	8	6¼–6¾
Newcastle -	9½	9	9½	9½	9½	9	8½	6
Newport(Mon.)	8½	8½	7½	8½	8½	8½	7½ 8	5½
Northampton -	8½	8½	8½	8½	—	8½	7½ 8	5½
North Shields -	10	10	10	10½	9½	8¼	9	6½–7
Norwich - -	8	8	8	8	7½	8	6½	5
Nottingham -	9½	9	9	10	9	9	8½	6½–7
Oldham - -	9½	10	9½	9	8½	9	8½	5½–7
Oxford - -	8½	8	8	8	8	8	7	5½
Paisley - -	9	9½	9	9	9	9½	9	6
Perth - -	8	10	8	8	8	8	7½	5½–6
Plymouth -	8	8	8	8	8	8	7	5
Portsmouth -	8½	8½	8	8½	pce.	7½	6½ 7	6
Preston - -	9½	10	9	8½	8½	8½	8½	5½–6
Rochdale - -	9½	10	9	9	8¼	9	8½	5½–6½
Rotherham -	9½	9½	8½	8½	8	8½	7½	6
St. Helens -	9	9	9	9	9	8½	8¼	5½–6
Scarborough -	8½	8½	8	8¼	33s. wk.	8	7½	6
Sheffield - -	9½	9½	9	9	9	9	7½	5½–6½
Southampton -	7½	8	8	8	pce	8	7	5
Southport -	9	9	8¾	9	9	9	8½	6
South Shields -	9½	—	9½	—	9½	8½–1/16	9	6
Stockport -	9½	9½	9	10	8½	8½	8	4¼–7
Stockton - on - Tees - -	9	9½	9¼	9½	9½	9	8	6¼–6½
Sunderland -	9½	10	9¼	10	10	8½	9	6½–7
Swansea - -	8½	—	8½	8½	—	8½	7½	5½
Torquay - -	7	7	7½	7	7	7	7	4½–5
Wakefield -	9	8½	8	8½	8	7½	7½	6
Walsall - -	9	8½	8½	8½	8½	8½	7	5¾–6½
Warrington -	8¾	9¼	9¼	9½	8½	9¼	8	5½–6½
West Bromwich	9½–10	9	8½	9	pce.	8¼	7	6–6½
Wigan - -	9½	10	9	9	8½	9	8½	5½–7
Wolverhampton	9	9	9	8½	8½	9	7½	6–6½
Worcester -	8½	8½	8½	8½	8½	8½	7	5½
Yarmouth -	7	7½	7½	A	7½	5½–7	6	4–4½

A. Done by bricklayer.

Current Market Prices.

FORAGE.

		£ s. d.	£ s. d.
Beans	per qr.	1 14 0	1 16 0
Clover, best...	per load	4 4 0	4 15 0
Hay, good	do.	3 17 6	4 2 6
Sainfoin mixture	do.	4 0 0	4 7 6
Straw...	do.	1 8 0	1 14 0

MISCELLANEOUS.

		£ s. d.	£ s. d.
Bricks Stocks, d/d to job	per 1,000	1 15 0	—
Do. Flettons on rail ...	do.	1 5 0	—
Do. Pressed Wire Cuts, d/d to job ...	do.	1 17 0	—
Do. Blue brindled wire cuts	do.	1 2 0	—
Do. do. wire cuts ...	do.	1 6 0	—
Do. do. pressed facings	do.	1 17 6	—
Coke Breeze, into carts at gasworks ...	per load	0 2 0	—
Do. d/d to job	do.	0 4 0	—
Sand	per yard	0 7 6	—
Ballast	do.	0 6 6	—
Granite Chippings ...	do.	0 10 6	—
Do. do. ¼in. ...	do.	0 11 6	—
Do. Broken, 1½in. ...	do.	0 15 6	—
Do. do. 2in. ...	do.	0 15 0	—
Do. do. 2½in ...	do.	0 14 6	—
Do. Kerb, Norwegian 6×12 and 12×6 in river	per foot	0 1 2	—
Do. do. do. circular	do.	0 1 5	—
Do. do. do. 12×8 in river	do.	0 1 5	—
Do. do. do. circular	do.	0 1 8	—
Do. do. Guernsey 6×12 in river	do.	0 1 4	—
Do. do. do. circular	do.	0 1 6	—
Do. do. do. 12×6 do.	do.	0 1 6	—
Do. do. do. do.	do.	0 1 8	—
Do. do. do. 18×8 do.	do.	0 1 8	—
Do. do. do. do.	do.	0 1 10	—
Do. Pitchings, Norwegian, 3×6	per ton	1 8 0	—
Do. do. do. 3×7	do.	1 10 0	—
Do. do. do. 3×5	do.	1 9 0	—
Do. do. do. 4×5	do.	1 8 0	—
Do. do do. 4×4	do.	1 13 0	—
Do. do. do. 4×6	do.	1 5 0	—
Do. do. do. 5×6	do.	1 4 0	—
Do, do. do. 5×7	do.	1 4 0	—
Do. do. do. Special, 4×6	do.	1 11 0	—
Do. do. do. do. 5×7	do.	1 18 0	—
Do. do. Guernsey, 3×6	do.	1 10 0	—
Do. do. do. 3×7 & 3×9	do.	1 8 6	—
Do. do. do. 3×5	do.	1 10 0	—
Do. do. do. 4×5	do.	1 10 0	—
Do. do. do. 4×4	do.	1 13 0	—
Do. do. do. 4×6	do.	1 9 0	—
Do. do. do. 4×7	do.	1 6 6	—
Do. do. do. 5×6	do.	1 6 0	—
Do. do. do. 5×7	do.	1 5 0	—
Do. do. Specials add.	do.	0 6 0	—
Glass, English Sheet, in crates of stock sizes, 15oz., 2nds	per sq. ft.	0 0 3½	—
Do. do. do. do. 3rds.	do.	0 0 2½	—
Do. do. do. 21 oz. 2nds	do.	0 0 5	—
Do. do. do. do. 3rds	do.	0 0 3½	—
Do. do. do. 26 oz. 2nds	do.	0 0 6	—
Do. do. do. do. 3rds	do.	0 0 4¼	—
Do. do do. 32 oz. 2nds	do.	0 0 8	—
Do. do. do. do. 3rds	do.	0 0 6	—
Do. English patent plain rolled plate in stock crates ⅛	do.	0 0 2	—
Do. do. do. 3/16	do.	0 0 2¼	—
Do. do. do. ¼	do.	0 0 2½	—
Do. Atter (Abo.) do. & White, Inf. 5th, 3×8	do.	8 10 0	—
Do. do. (do.) Yellow, unsorted, 3×9	do.	9 10 0	—
Do. Constantza, White, 3rd, 3×11	do.	9 10 0	—
Cement	per ton	1 12 0	—
Lime	do.	1 4 0	
Castor Oil, French ...	per cwt.	1 10 0	1 2 0
Colza Oil, English ...	do.	1 9 9	—
Copperas	per ton	2 0 0	—
Lard Oil	per cwt.	2 15 0	2 17 0
Lead, white, ground, carbonate	per ton	16 0 0	—
Do. red	do.	15 0 0	19 0 0
Linseed Oil, barrels ...	per cwt.	0 19 0	—
Petroleum, American ...	per gal.	0 0 6⅜	0 0 6½
Do. Russian ...	do.	0 0 6	0 0 6⅛
Pitch	per barrel	0 9 0	—
Shellac, orange	per cwt.	10 19 0	—
Soda, crystals	per ton	3 2 6	3 5 0
Tallow, Town	per cwt.	1 12 0	—
Tar, Stockholm	per barrel	1 5 0	—
Turpentine	per cwt.	2 5 10½	—

METALS.

		£ s. d.	£ s. d.
Standard Copper	per ton	86 10 0	87 0 0
Do. Strong sheets ...	do.	86 10 0	87 0 0
Lead, soft foreign	do.	18 5 0	18 10 0
Do. English	do.	18 10 0	19 0 0
Do. pipes...	do.	21 5 0	21 10 0
Do. sheets	do.	20 15 0	21 0 0
Galvanised Corrugated sheets	per ton	12 15 0	12 17 6
Spelter G.M.	do.	27 10 0	27 15 0
Angles, Scotland	do.	6 15 0	7 0 0
Bars, do.	do.	7 15 0	8 0 0
Marked bars, Staffs. ...	do.	8 10 0	8 12 6
Common bars, do. ...	do.	6 5 0	6 10 0
Angles, M'boro.	do.	6 7 6	6 10 0
Joists. M'boro	per ton	6 5 0	6 7 6
Angles, Midlands	do.	6 12 6	6 15 0
Joists do.	do.	6 17 6	7 0 0
Girder plates, Midlands ...	do.	7 7 6	7 10 0
Angles, Foreign, c.i.f. Thames	do.	6 7 6	6 10 0
Tees do. do. do.	do.	6 10 0	6 12 6
Joists, do. do. do.	do.	6 2 6	6 4 0
Channels do. do. do.	do.	6 7 6	6 8 6
Plates do. do. do.	do.	6 17 6	7 2 6
Tin, Foreign	do.	184 10 0	185 0 0
Do. English ingots ...	do.	184 0 0	185 0 0
Zinc, sheets, Silesian ...	do.	28 0 0	30 0 0

TIMBER.

SOFT WOODS.

		£ s. d.	£ s. d.
Fir, Dantzic and Memel	per load	2 17 6	5 5 0
Pine, Quebec, Yellow ...	do.	3 12 6	6 0 0
Do. Pitch, American ...	do.	3 9 0	5 0 0
Laths, log, Dantzic	per cu. fath.	4 0 0	6 0 0
Deals, Archangel, Yellow 2nd, 4×9	per std.	16 5 0	—
Do. do. do. do. 3rd, 3×9	do.	11 0 0	—
Do. do. do. do. do.	do.	11 0 0	—
Do. Asbacka, Yellow, 4th, 3×9	do.	10 16 0	—
Do. Blankaholm, White, 1st, 3×9	do.	8 15 0	—
Do. Gefle, Yellow, Inf. 5th, 3×4	do.	7 10 0	—
Do. Mo, Yellow, 4th, 3×7	do.	9 15 0	—
Do. do. do. do. 2½×7	do.	10 5 0	—
Do. Rafso, Yellow. 4th, 3×11	do.	7 15 0	—
Do. do. do. unsorted, 3×4½	do.	9 0 0	—
Do. Montreal, dry Yellow Pine, 1st, 3×9	do.	23 5 0	—
Do. St. Petersburg, White, 3rd, 3×11	do.	8 15 0	—
Do. Petschora, Yellow, 2nd, 3×9	do.	15 5 0	—
Do. do. do. 3rd, 3×11	do.	10 5 0	—
Do. Wartsala, Yellow, 1st & 2nd, 2½×7	do.	10 0 0	—
Battens, Borga, Yellow, unsorted, 2×4	do.	10 0 0	—
Do. do. White, unsorted, 2×4	do.	9 0 0	—
Do. St. Petersburg, Yellow, 3rd, 2½×6½	do.	8 5 0	—
Do. do. White, 3rd, 2½×6	do.	7 15 0	—
Do. do. do. do. 2×6	do.	8 5 0	—
Do. Gamleby, unsorted 2×7	do.	9 5 0	—
Do. Gefle, Yellow, Inf. 5th, 2×4	do.	8 15 0	—
Do. Ingramport (N.S.), Yellow unsorted, 2×7	do.	7 5 0	—
Do. do. do. do. 2×8	do.	7 10 0	—
Do. Fredriksstad, White (planed) 1×10	do.	7 10 0	—
Do. do. Mixed Yellow (planed), 1×9	do.	9 0 0	—
Do. Christiania, Yellow (planed) 1st, 1×9	do.	13 5 0	—
Do. do. do. (do.) 2nd, 1×9	do.	10 15 0	—
Do. do. do. (do.) 3rd, 1×9	do.	9 10 0	—
Do. Mesane, Yellow, 1st, 1½×7	do.	14 5 0	—
Do. Riga, Yellow, unsorted, 2×7	do.	0 9 0	—
Do. Sando, White, 1st & 2nd, 2×4	do.	9 0 0	—
Do. Wartsala, Yellow, 1st & 2nd, 2×4	do.	9 15 0	—
Do. Wyburg, Yellow, 1st & 2nd, 2×4	do.	10 0 0	—
Flooring Boards, Fredriksstad, 1×7	do.	0 8 6	—
Do. do. Mixed Yellow, 1×6	do.	0 9 6	—
Do. do. do. do 1×5½	do.	0 9 0	—
Do. Gothenburg, Dry Yellow, 3rd, 1×7	do.	0 10 3	—
Do. do. do. do. 1¼×7	do.	0 12 9	—

HARD WOODS.

		£ s. d.	£ s. d.
Ash, Quebec	per load	4 0 0	7 0 0
Birch, New Brunswick ...	do.	2 15 0	4 15 0
Do. Quebec	do.	2 5 0	5 0 0
Box, Turkey	per ton	6 0 0	20 0 0
Cedar, Cuba	per ft. sup.	0 0 4½	0 0 6
Do. Honduras	do.	0 0 4½	0 0 5½
Do, Tobasco	do.	0 0 5⅝	—
Elm, Quebec	per load	4 0 0	8 5 0
Jarrah, planks	per ft. cu.	0 2 6	0 3 0
Mahogany, Average Price for Cargo, Honduras ...	per ft. sup.	0 0 4¼	0 0 5½
Do. Tobasco ...	do.	0 0 4	0 0 5½
Do. Cuba ...	do.	0 0 4½	0 0 5½
Do. African ...	do.	0 0 3¼	0 0 5
Do. Lagos ...	do.	0 0 3¼	0 0 5
Oak, Wainscot	per log	2 5 0	6 0 0
Teak, Indian, logs ...	per load	9 0 0	19 5 0
Do. do. planks ...	do.	12 0 0	20 5 0
Whitewood, American, logs	per ft. cu.	0 1 3	0 1 6
Do. do. planks and boards ...	do.	0 1	0 3 6

Builders' Current Price List of Specialities

This list is not intended to promote undercutting, and prices are subject to discounts for a quantity and for cash. Readers are advised to write for these discounts. Where prices for goods are standardised and fluctuation takes place in trade discounts, our prices have the discounts deducted. In some cases it is difficult for firms to quote prices, and we have stated where they will be pleased to send catalogues and quotations immediately on receipt of applications.

Goods.	Description.	Merchants or Manufacturers.	Address.	Size.	Weight.	Quantity. per	Price		
							On Rail.	Dlvrd. at London Termini.	Dlvrd. to Buyer
Baths:									
Iron	Rolled edge, white vitreous enamelled	Doulton and Co., Ltd.	Lambeth, London	5ft. 6in. inside	—	each	£4 7s. 6d.	—	—
Bathroom Suites	Complete as advertised	Standard Sanitary Manufacturing Co.	22, Holborn Viaduct, London	—	—	—	—	—	£18 18s.
Blinds:									
"Japa"	Sanitary	Japa Blinds, Ltd.	55, Barbican, London, E.C.	All sizes	72 long 36 wide	—	—	2s. 6d. to 16s. doz.	Free.
Boilers:									
Saville	Wrought-iron for hot-water heating and supply	Hartley & Sugden, Ltd.	Halifax	30×13 to 72×30	3 cwt. to 17 cwt.	each	£9 5s. to £52	Free in Great Britain.	
Bricks:									
Blue	Staffordshire pressed	Hathern Station Brick and Terra Cotta Co., Ltd.	Loughborough	9×4½×2⅝	3·5 tons	1000	£2 15s.	£3 13s.	—
Facing	Blue and brindled	G. Woolliscroft & Sons, Ltd.	Hanley, Staffs.	9×4½×3	3·75 tons	1000	35s. to 37s. 6d.	£4 3s. to £3 5s. 6d.	—
Facing	Red terra-cotta	G. Woolliscroft & Sons, Ltd.	Hanley, Staffs.	9×4½×3	3·75 tons	1000	£2 10s.	£3 18s.	—
Stocks	Sand stocks	Gibbs Brothers	Loughborough	9×4½×2⅝	2·12 tons	1000	£2	£2 15s.	—
Casements and Sashes:									
Metal Casements	Iron, steel, and bronze	George Wragge, Ltd.	London and Manchester	Registered sections	—	each	From 15s.	16s.	—
Metal Sashes	Ditto	Ditto	Ditto	Ditto	—	ft. super.	From 6d.	—	—
Castings:									
Iron	Plain and Ornamental	Walter Macfarlane & Co.	Saracen Foundry, Glasgow	—	—	—	Prices on application.		
Cement, Lime, &c.:									
Cement	Portland	Associated Portland Cement Mnfrs. (1900), Ltd.	Dixon House, 72, Fenchurch Street, E.C.	—	—	—	Prices on application.		
Lime	—	Associated Portland Cement Mnfrs. (1900), Ltd.	Dixon House, 72, Fenchurch Street, E.C.	—	—	—	Prices on application.		
Chimney-Pieces:									
Marble	—	J. & H. Patteson	7, Bayley Street, Bedford Sq., London, and Oxford Street, Manchester	—	—	—	Prices on application.		
Chimney Pots	"Notlor" patent self-flanching and weathering	Notley & Taylor	Finsbury Pavement House, E.C.	9×9 and 14×9 flues	—	—	—	From 3s. 6d.	—
Closets:									
Cisterns, Seats, &c.	For houses	Adamsez, Ltd.	Scotswood-on-Tyne	—	—	set with fittings.	£2 to £10	—	—
Latrines	For schools and workmen	Adamsez, Ltd.	Scotswood-on-Tone	—	—	stall	30s. to 70s.	—	—
"Simplicitas"	—	Doulton & Co., Ltd.	Lambeth, London	—	—	each	£1 15s.	—	—
Columns	Cast-iron	Measures Bros., Ltd.	53B, Southwark Street, London, S.E.	stock patterns	—	ton	£7	£7	—
Compoboard	Swedish	Messers, Ltd.	79½, Gracechurch Street, E.C.	4ft.×8 to 18ft.×⅜in. and ½in.	1 ton	2,000ft. super.	Prices on application.		
Concrete:									
Armoured	Floors and roofs	Trussed Concrete Steel Co.	Caxton House, Westminster	—	—	sq. yard	—	—	8s.*
Conduits:									
"Simplex" steel	Screwed wireduct	Simplex Steel Conduit Co., Ltd.	Garrison Lane, Birmingham	½ to 2 diam.	20lbs. to 140lbs.	100ft.	—	—	12s. 8d. to £3 3s.
Door Furniture:									
Door Springs	With silent check	Robert Adams (patentee)	3 & 5 Emerald Street, London, W.C.	For medium doors	—	each	D.A. 46s. S.A. 42s.	D.A. 46s. S.A. 42s.	—
Sliding Door Fittings	Top and bottom rollers and guide rails	John Bousfield	Bar Ironworks, York	various	—	each	—	rollers from 6s. 6d.	—
Elevators:									
"Otis"	Electric and hydraulic	Otis Elevator Co. Ltd.	4, Queen Victoria Street, London	—	—	—	Prices on application.		
Enamels:									
"Sanaline"	Pure white or colours	Aspinal's Enamel, Ltd.	New Cross, London	—	—	gallon	—	—	18s.
Faience:									
White and coloured	For elevations	Alfred Whitehead	Prudential Build'gs, Leeds	—	—	sq. yard	74s. 6d.	79s.	—
Fans:									
Fans, Blowers, and Motors	Belt, electric or steam driven	Matthews & Yates, Ltd.	Cyclone Works, Swinton, Manchester	All sizes	—	—	Prices on application.		
Felt:									
Ruberoid Sacking Felt	High-grade inodorous felt	Robert W. Blackwell & Co., Ltd.	59, City Road, London, E.C.	36×72	44lbs.	roll, 24sq. yds.	—	—	13s. 6d.
Fencing:									
Iron	"Greenhill" patent automatic railing	Hill & Smith	Brierley Hill Iron Works, Staffs.	3½ft. high ⅝ verticals	40lbs. yard	yard	4s. 5d.	4s. 9d.	—
Fireproofing (See also Partitions):									
Terrawode Brick-wood	Fireproof floors	Jabez Thompson & Sons	Northwich, Cheshire	4ins. thick	—	sq. yard	6s.	7s.	—
Columbian	Reinforced concrete floors and roofs	Columbian Fireproofing Co.	37, King William Street, London	—	—	—	Prices on application.		
Steel Sheeting	For partitions, reinforced concrete, damp course, &c.	The Fireproof Co., Ltd.	10, York Build'gs, Adelphi, W.C.	All sizes	All weights	sq. yard	from 1s. 3d.	from 1s. 3d.	plus rail
Expanded Steel	Reinforcement for every description of concrete work	New Expanded Metal Co.	York Mansion, York, St., Westminster, S.W.	Up to 16ft. ×8ft.	2lbs to 30 lbs.	sq. yard	5d. to 4s. 9d.	Price list on application.	
Floors and Roofs	Steel concrete	Homan & Rodgers	17, Gracechurch Street	—	—	sq. yard	—	—	7s.*
Floors and Roofs	Reinforced concrete	Trussed Concrete Steel Co.	Caxton House, Westminster	—	—	sq. yard	—	—	8s.*
Floors and Roofs	Reinforced concrete	Potter & Co., Ltd.	66, Victoria St., London, S.W.	—	—	sq. yard	—	—	From 6s.*
Floors:									
Columbian	Concrete fireproof floors and roofs	Columbian Fireproofing Co.	37, King William Street, London	—	—	—	Prices on application.		
Euboeolith	Patent flooring	Euboeolith Patent Flooring	3, Victoria St., Westminster	—	—	yd. super.	5s. to 6s.	—	—

* Erected.

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Builders' Current Price-List of Specialities—*(continued).*

Goods.	Description.	Merchants or Manufacturers.	Address.	Size.	Weight.	Quantity per	Price.		
							On Rail.	Dlvrd. at London Termini.	Dlvrd. to Buyer.
Galvanised Iron:									
Sheets	Corrugated	Baldwins, Ltd.	5, Fenchurch St., London, E.C.	5ft. to 9 ft. × 2ft. × 22 or 24 G.	—	ton	—	£14 10s.	—
Sheets	Flat	Baldwins, Ltd.	5, Fenchurch St., London, E.C.	72 × 24 to 36 × 20 or 24 G.	—	ton	—	£15	—
Buildings	Of every description	Baldwins, Ltd.	5, Fenchurch St., London, E.C.	—	—	—	Prices on application.		
Gas Generators:									
Acetylene	Five-light portable	Strode & Co.	48, Osnaburgh Street, London.	15ins. diameter, 24ins. high.	—	each	—	£3	—
Glass:									
Stained & Embossed	Leaded lights, embossed and brilliant cut-glass	Young & Martin, Ltd.	Stratford, E.	—	—	—	Prices on application.		
Stained	Memorial & other windows	E. E. Oldacre & Co.	Stirling Place, Hove	—	—	ft. super.	Prices on application.		
Guards, Wire:									
Straight Lattice	Half mesh	Richard Johnson, Clapham, & Morris, Ltd.	Manchester	6ft. × 3ft.	14lbs.	sq. ft.	5d.	5½d.	5¾d.
Hooks:									
Hat and Coat	"Schola" pattern for schools, &c.	Brookes & Co., Ltd.	4, Cateaton Street, Manchester.	—	—	—	Prices on application.		
Joinery:									
Panelling	High-class 1-in. Austrian oak panelling.	Elliott's Moulding & Joinery Co., Ltd.	Newbury	3ft. to 7ft. high.	ft. super.	2s.	2s. 1d.	—	—
Joists:									
Steel	Broad flange beams	H. J. Skelton & Co.	71, Finsbury Pavement, London, E.C.	—	—	ton	—	£6 18s.	—
Steel	English and foreign	Columbian Fireproofing Co.	37, King William Street London.	—	—	—	Prices on application.		
Steel	Belgian and German	Measures Bros., Ltd.	53B, Southwark Street, London, S.E.	3 to 20 deep	—	ton	£6 17s. 5d. basis sections.	£6 17s. 6d. basis sections.	--
Laundry Machinery:									
Finishing Machines	For Shirts, Collars, & Cuffs	W. Summerscales & Sons, Ltd.	Keighley, Yorks	12ins. to 42ins.	—	each	£30 to £50	£30 10s. to £51 10s.	--
Lavatories:									
Glazed Ware	For schools, workmen, and private houses.	Adamsez, Ltd.	Scotswood-on-Tyne	—	—	set, with fittings	£1 10s. to £4	—	—
Leaded Lights	All descriptions	E. E. Oldacre & Co.	Stirling Place, Hove	—	—	ft. super.	Prices on application.		
Lifts:									
Electric	All other types	A. Smith & Stevens	Battersea, London	All sizes.	All weights.	—	Prices on application.		
Hand-power	All kinds, for all purposes	George Johnson	227, St. John's Hill, London, S.W.	—	—	—	Prices on application.		
"The Premier"	Dinner and service lift to raise ¾ cwt.	The Lift & Hoist Co.	Premier Iron Works, Prince Street, Deptford, S.E.	Cage *inside* 2ft. wide, 1ft. 6 deep. 2ft. 6 high.	—	—	—	£9 10s.	—
Lighting and Heating:	Electric light and gas-fittings, &c.	Young & Marten, Ltd.	Stratford, E.	—	—	—	Prices on application.		
Lightning Conductors	Copper tape	Joseph Lewis	5 & 6, Great Winchester Street, London, E.C.	$\frac{3}{4} \times \frac{1}{8}$ and upwards.	—	foot run	from 1s.	—	—
Locks:									
Coin Collecting	Bright brass or bronzed	New Century Co.	235, High Holborn, London, W.C.	14ins. × 4¼ins. × 1¼ins.	—	each	—	—	35s.
Kaye's Patent	Four lever mortice, iron and brass.	Joseph Kaye & Sons, Ltd.	93, High Holborn, London, W.C.	—	—	each	—	—	7s. 6d. 10s. 6d
"C. and B."	Registered mortice Nos. 1, 2, and 3.	Colledge & Bridgen	Midland Works, Wolverhampton.	6 inch.	—	dozen	—	—	£3 6s. £2 5s., £1 9s.
Mantelpieces:									
White Wood	With overmantel	The Hardware Trading Co.	12, New Oxford Street, London, W.C.	Opening 38 × 38	72ins.	each	£2	—	—
Marble, Mosaic, and Stone Work:									
Glass Mosaic	Coloured art	The Cloisonné Glass Co.	40, Berners Street, W.	—	—	sq. ft.	—	From 3s. upwards.	—
	Plain or design	J. & H. Patteson	7, Bayley Street, Bedford Square, London, and Oxford Street, Manchester.	—	—	—	Prices on application.		
Motor Wagons	Steam	St. Pancras Ironworks Co. Ltd.	171, St. Pancras Road, London, N.W.	—	4 tons 19 cwt.	each	—	From £530.	—
Paint:									
"Japonika," Enamel	Elastic, impervious, covers 90yds. sup. per gal.	John Line & Sons, Ltd.	Alfred Pl., Tottenham Court Rd., London, W.C.	—	—	gallon	18s.	—	—
Anti-corrosive, &c.	"Bitumastic" solution and enamel	Wailes, Dove & Co., Ltd.	Newcastle-on-Tyne, London, Liverpool, Cardiff, Birmingham, and Glasgow	—	—	—	Prices on application.		
Partitions:									
Dovetail Corrugated Steel Sheeting	For partitions, reinforced concrete, &c.	The Fireproof Co., Ltd.	10, York Buildings, Adelphi, W.C.	All sizes	All weights	sq. yard	From 1s. 3d.	From 1s. 3d.	1s. 3d. plus rail
Partitions	"Kulm" slabs	H. W. Cullum & Co.	Craven House, Kingsway, London, W.C.	—	—	sq. yard	Prices on application.		
Patent Plaster	Hollow interlocking blocks	Havelock Patent Plaster Partition Co.	63, Finsbury Pavement, E.C.	29 × 17	70lbs.	super. yard.	3s. 6d.	4s. 6d.	6s. *
Plaster	Partition slabs	Jabez Thompson & Sons	Northwich, Cheshire	12 × 12 × 2	—	sq. yard	3s. 6d.	4s.	—
Porous Brick	Porous terra-cotta blocks	Hempstead Patent Brick Co.	Hemel Hempstead	9 × 12 × 1½	—	sq. yard	2s.	2s. 4d.	—
Terrawode Brickwood	Partition bricks	Jabez Thompson & Sons	Northwich, Cheshire	9 × 4½ × 3	2 tons	1000 sq. ft.	£3 5s.	£4 9s.	—
School	——	John Stones	"Rosside," Ulverston	—	—	—	Prices on application.		
Pavement Lights	Prismatic	St. Pancras Ironworks Co.,	171, St. Pancras Road, London, N.W.	—	—	per ft. super.	—	From 4s. 6d.	—
Photo Prints, Copies, &c.:									
"True to scale"	(Dorel system)	L	13, Railway Approach, London Bridge, S.E.	Imperial	—	2 copies	—	—	2s. 3d. p. free
True scale	Dorel and photo-litho methods	Vincent, Brooks, Day & Son, Ltd.	48, Parker Street, Kingsway, London, W.C.	—	—	—	Prices on application.		
All Kinds	On any material	London Drawing and Tracing Office.	98, Gray's Inn Road	—	—	—	Prices on application.		

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Builders' Current Price-List of Specialities—*(continued).*

Goods.	Description.	Merchants or Manufacturers.	Address.	Size.	Weight	Quantity. per	Price.		
							On Rail,	Dlvrd. at London Termini.	Dlvrd. to Buyr.
Pipes:									
Columbian - - -	Armoured cement for water and sewage conveyance	Columbian Fireproofing Co.	37, King William Street, London	—	—	—	Prices	on applica	tion.
Iron Soil - - -	Large assortment of fittings stocked	Burn Brothers - - -	Rotunda Works, 3, Blackfriars Rd., London, S.E.	2ins. to 6ins.	L.C.C. & heavy	—	Prices	on applica	tion.
Pipe joint paste - -	"Wisconsin" Graphite -	G. F. Hopkins & Co - -	112, Westminster Bridge Road, London, S.E.	—	—	1 lb. to 60 lbs.	1s. 1d. to 6½d.	—	—
Plaster:									
Fibrous, &c. - -	For relief decoration -	G. & A. Brown, Ltd. -	167, Hammersmith Road, W.	—	—	—	Prices	on applica	tion.
Keene's & Parian -	——	Associated Portland Cement Mnfrs. (1900), Ltd.	Dixon House, 72, Fenchurch Street, E.C.	—	—	—	Prices	on applica	tion.
"Pytho" - - -	For interior plastering -	Plaster, Brick, and Stone Co., Ltd.	Wall Grange, near Leek, Staffs.	—	1 ton	—	37s. 6d.	42s. 2d.	—
Rainwater Heads and Pipes:									
Rainwater Heads -	Cast lead and iron - -	George Wragge, Ltd. -	London and Manchester -	stock designs	—	each	From 16s. 6d.	17s. 6d.	—
Roofs:									
Ruberoid Roofing -	High-grade prepared roofing	Robert W. Blackwell & Co., Ltd.	59, City Rd., London, E.C.	36×72	40lbs. to 100lbs.	216 sq. ft.	—	½ ply, 17s. 4d.; 2 ply, £1 6s. 6d.	1 ply, 20s. 6d.; 3 ply, 34r. 6d.
Steel - - - -	Principals and corrugated iron	E. F. Blakeley & Co. -	Vauxhall Ironworks, Liverpool	—	—	ft. super.	—	From 6d. upwards.*	—
Sanitary:									
Engineers' Appliances	Baths, lavatories, closets, pipes, cisterns, pumps, &c.	Young & Marten, Ltd. -	Stratford, E. - -	—	—	—	Prices	on applica	tion.
Syphons and Tanks -	Automatic flushing - -	Adamsez, Ltd. - - -	Scotswood-on-Tyne - -	—	—	each	£1 to £3	—	—
Waste Preventers -	"Paisley," painted - -	Doulton & Co., Ltd. - -	Lambeth, London - -	2 gallon	—	each	£1 3s. 6d.	—	—
Waste Preventers -	"Well," painted - -	Doulton & Co., Ltd. - -	Lambeth, London - -	2 gallon	—	each	16s.	—	—
Scaffolding:									
Putlogs - - -	Hewn birch - - -	Vigers Bros. - - -	67-68, King William Street, E.C.	—	—	dozen	5s. 3d. in docks	—	—
Shutters:									
Revolving - - -	No. 7 convex wood lath -	Clark, Bunnett & Co., Ltd.	New Cross Road, London, S.E.	—	—	ft. super.	1s. 6d.	—	—
Signs - - - -	Anything and Everything -	H. B. Torode - - -	22, Henrietta St., Strand	L.C.C. regulation size	—	—	Prices	on applica	tion.
Sinks:									
Glazed Ware - -	"Krator," "Helios," "Belfast," and "Edinburgh"	Adamsez, Ltd. - - -	Scotswood-on-Tyne -	—	—	each	10s. to £5	—	—
Slates and Slating:									
"Arfon" Slates -	Unfading green - - -	Pearson Bros. & Campbell	18, Water St., Liverpool -	—	—	—	Prices	on applica	tion.
Buttermere or Cumberland & Westmoreland Green Slates	Light sea green, olive, and dark	Buttermere Green Slate and Stone Works	Keswick - - - -	30 to 12 long	—	ton	£4 5s.	£5	—
Slating and Tiling -	All kinds—green slating speciality	Roberts, Adlard & Co. -	London, Faversham, Brighton, &c.	as required	—	1 000	Prices	on applica	tion.
Slates and Slating -	Portmadoc, French, and American	Young & Marten, Ltd. -	Stratford, E. - - -	—	—	—	Prices	on applica	tion
Sound-Proofing:									
Deafening Quilt -	Cabots' double ply - -	Arthur L. Gibson & Co. .	19/21, Tower St., Upper St. Martin's Lane, London, W.C.	—	120 lbs.	bale, 500 sq. ft.	36s. 6d.	—	—
Springs:									
Door Checks - - -	"Blount" - - - -	Charles Winn & Co. - -	Birmingham - -	—	—	—	Prices	on applica	tion
Stone:									
Bramley Fall - -	Sandstone, light and grey -	B. Whitaker & Sons, Ltd.	Horsforth, near Leeds -	any sizes	14ft. to 1 ton	cube ft.	10d.	1s. 9d.	—
Granite - - -	Architectural and monumental	Kirkpatrick Brothers -	Trafford Park, Manchester	—	—	—	Prices	on applica	tion
Dark-Bed Hopton Wood	Hard limestone, colour grey	J. Hodson & Son, Ltd. -	Nottingham - - - -	random blocks	—	foot cube	1s. 2d.	2s.	—
Yorkshire - - -	Sandstone, various colours	J. Hodson & Son, Ltd. -	Nottingham - - -	random slabs	14ft. cube to ton	foot cube	From 2s.	From 2s. 10d.	From 3s.
Staircases:									
Spiral - - -	——	St. Pancras Ironworks Co., Ltd.	171, St. Pancras Road, London, N.W.	From 3ft. 6ins. diam.	—	per ft. rise	—	From 13s.	—
Terra-cotta:									
Window Heads -	Buff or red - - - -	Walwyn T. Chapman -	Cleethorpes - - -	3×9 4½×10	1 cwt.	each	5s.	—	—
Tiles:									
Coloured Enamelled	Best quality in brown, blue, green, &c.	Carter & Co. - - -	Encaustic Tile Works, Poole.	usual sizes	1 ton	55 yds. sup.	10s. 6d. per yd.	11s. per yd. sup.	11s. 2d. per yd.
Tessellated - -	Best quality any plain pattern	Carter & Co. - - -	Encaustic Tile Works, Poole.	usual sizes	2 tons	80 yds. sup.	5s. per yd. sup.	5s. 4d. per yd.	5s. 6d. per yd.
Decorative - - -	Floor - - - - -	Craven, Dunnill & Co., Ltd.	Jackfield, R.S.O., Shropshire	every size	56 lbs.	sq. yard	from 3s. 6d.	4s. 6d.	4s. 6d.
Ditto - - -	Wall - - - - -	Craven, Dunnill & Co., Ltd.	Jackfield, R.S.O., Shropshire	—	40 lbs.	—	from 5s. 6d.	6s. 4d.	6s. 4d.
Ditto - - -	Mosaic - - - -	Craven, Dunnill & Co., Ltd.	Jackfield, R.S.O., Shropshire	—	48 lbs.	—	from 13s. 9d.	15s.	15s.
Ditto - - -	Faience - - - -	Craven, Dunnill & Co., Ltd.	Jackfield: R.S.O., Shropshire	—	170 lbs.	—	from £1 3s.	£1 5s.	£1 5s.
"Opalite" - -	Opal glass, with Shelmerdine backing	Wm. Griffiths - - -	126, Hamilton Ho., Bishopsgate St., Without, E.C.	9×3 and 6×6	—	sq. yard	—	—	10s. 6d.†
Wall - - - -	Patent undercut back -	T. & R. Boote, Ltd. - -	Burslem - - - - -	6×6	50 lbs.	sq. yard	6s.	6s. 6d.	6s. 9d.‡
"Durolite" - -	Glass tiles, with patent fireproof backing to prevent surface cracking	Durolite Ltd. - - -	36, Camomile Street, London, E.C., and St. Helens, Lancashire	white and tinted 6×6 and 9×3 marbled 12×6	—	sq. yard	—	—	white† 10s. 0d. tinted† 11s. 6d. mrbls.† 12s. 6d.
Timber:									
Planks - - -	Dry Mahogany and Oak -	James W. Southern & Son	Store Street Saw Mills, Manchester.	—	—	—	—	—	—
Tracing Cloth:									
"Ivorine" - - -	Pure white - -	Norton & Gregory, Ltd. -	Castle Lane, Westminster	30ins. × 24yds.	—	roll	—	—	22s. 6d.
"Koh-i-noor" - -	——	L. & C. Hardmuth - -	12, Golden Lane, London, E.C.	30, 36, 40, 42	—	roll of 24 yds.	Prices	on applica	tion.
"Triumph" Brand -	Blue - - - - -	Norton & Gregory, Ltd. -	Castle Lane, Westminster	30ins. × 20yds.	—	roll	—	—	12s. 6d
Urinals:									
Glazed Ware - -	Circular slab and T-backs	Adamsez, Ltd. - - -	Scotswood-on-Tyne - -	—	—	stall, with fittings	£3 to £15	—	—
Ventilators:									
"Acme" & Spherical	Exhausts and intakes -	Acme Ventilating & Heating Co.	35, Tarleton Street, Liverpool	6ins. to 24 diam. tube	—	each	—	—	17s. 6d. to £15.
Boyle's Patent - -	Latest "air-pump" ventilators (design No. 175)	Robert Boyle & Son - -	London and Glasgow -	12ins. to 54ins. diam.	—	each	—	—	25s. to £18 18s.
Vices:									
"Lightning" - -	Instantaneous action - -	C. Nurse & Co. - - -	181-183, Walworth Road, London, S.E.	jaws 9 ins. opening 12	50 lbs.	each	17s.	—	—

* Erected. † Approximate price fixed, complete, in London. ‡ Executed.

This List is not intended to promote undercutting. Readers should write for discounts for quantity and for cash.

THE BUILDERS' JOURNAL

AND ARCHITECTURAL ENGINEER.

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Byres.

THE architectural profession is one which has perforce to take a good deal of interest in subjects which may be considered to lie outside the wide range of its technicalities. The hospital architect has to know something of the treatment of disease; and of late much attention has been drawn to the treatment of consumptives as vitally affecting the planning of sanatoria. The subject of hygiene is perhaps more closely connected with architectural design than other branches of general knowledge, and the opinions of the medical profession are therefore always worthy of the attention of architects. An interesting outcome of the treatment of those suffering from tuberculosis or consumption is suggested in the latest medical theories on the subject, and a book by Dr. W. Pickett Turner, M.D., on the origin and extinction of this disease puts forward a proposal which may have considerable influence upon the architectural design of buildings other than hospitals or sanatoria. It may be familiar to our readers that some time ago Professor Koch expressed grave doubts as to tuberculosis among cows being of the same form as that from which humanity suffers; he did not think, therefore, that the disease could be communicated by animals to men. This theory was thoroughly investigated and disposed of, and it appears that tuberculosis is communicable. Dr. Turner, reasoning on such a basis, assumes that we derive the germs of consumption chiefly from two sources—namely, the flesh (beef) and the milk of the cow, both of which form a large part of human food. The bacilli in milk or beef may be killed by cooking; milk may be Pasteurised or passed through a germ-proof filter. So far, so good, but unfortunately, supposing we eliminate beef as a serious cause from the fact that it is almost invariably cooked, it is too much to expect that all milk will be sterilised. Dr. Turner's remedy cuts at the root of the matter by suggesting that bovine tuberculosis is preventable. He explains the manner in which the disease can be dealt with, and this is very simple. All we have to do is to provide the cow with those conditions which, in the bovine or human species, make the body fit to defy the tubercle bacillus. Dr. Turner believes that the most important of these conditions is an abundant supply of sunlight. He thinks that cowhouses should be provided with transparent roofs so as to admit the sun's rays, and that they should be properly ventilated. We have it on the authority of Dr. C. W. Saleeby, M.D., F.R.S.Edin., that it is not the wild animal, but the housed animal, that suffers from consumption. He says: "This is known to be true of the bovine species, and lately it has been proved to be true of the monkeys and many other animals at the '*Zoo.*' When these were provided with nice warm, cosy, closed cages they died of consumption, one after another; the disease disappeared when they were left to take their luck in the open air—even though its temperature was far below that of their native regions." In view of this it will be readily appreciated that the ordinary type of cowshed is extremely inefficient. Cowsheds or byres are erected on two types; one where the cows are placed in single rows along the length of the building, and the other where they stand in two rows facing or backing on each other. The latter type is, perhaps, the more common, and the cows are placed with either a feeding or dunging passage in the centre. The animals are also usually tied together in pairs. It is obvious that infection can thus be easily communicated from one animal to another. Furthermore, ventilation and lighting are generally very bad, as they are also in stables for horses. It is beginning to be recognised, however, that the horse in its wild state is a native of a dry country and accustomed to an open-air life, and that the nearer we approximate to these natural conditions the better chance there is of keeping the animal in good health. It has not been thought worth while to trouble about the cow, but we now see that it is equally, if not more, important to study these conditions in the planning of byres. It has often been stated that if a plentiful air supply is given, the animals catch colds, but this is a mistake. A small stream of cold air constitutes a draught, which causes colds, but if the whole body is immersed in a quick moving stream of cold air no ill-effects result. It has been proved that it is better that an animal should be cold through the provision of fresh air (as it would be if left out in the open) rather than that it should be kept warm by confinement in the vitiated air of an unventilated, close and noisome stable. Each animal should obtain its supply of fresh air direct, if possible, and not after it has passed along the length of a stable and become tainted by the breath of other animals or the emanations of the stable. For this reason windows should be provided to each stall, and the stall should be single. Again, in regard to the sanitation of the stable, in connection with mangers, paving, and drainage, there is much improvement to be effected; but these various details have all been well worked out for stables for horses, and it only needs to adopt the same measures in stables for cows and bullocks. The architect has not paid sufficient attention to the design of places to receive animals of all kinds, such as markets and abattoirs, and, indeed, the ordinary piggeries upon estates. The principles that have been found advantageous to health dealt with above should be followed in providing accommodation for animals of all kinds.

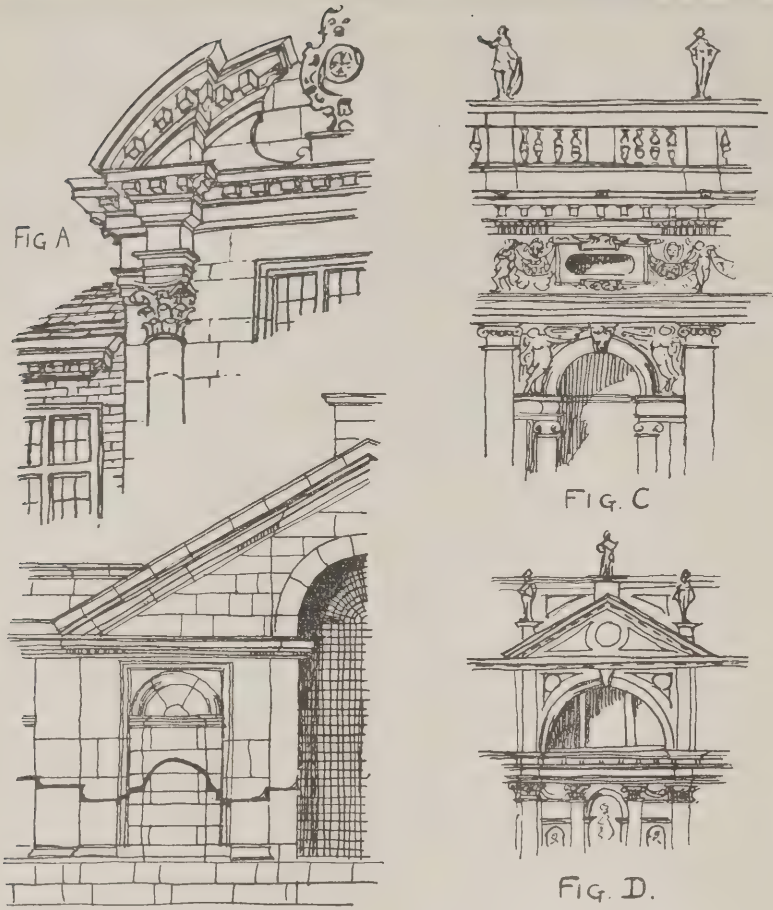
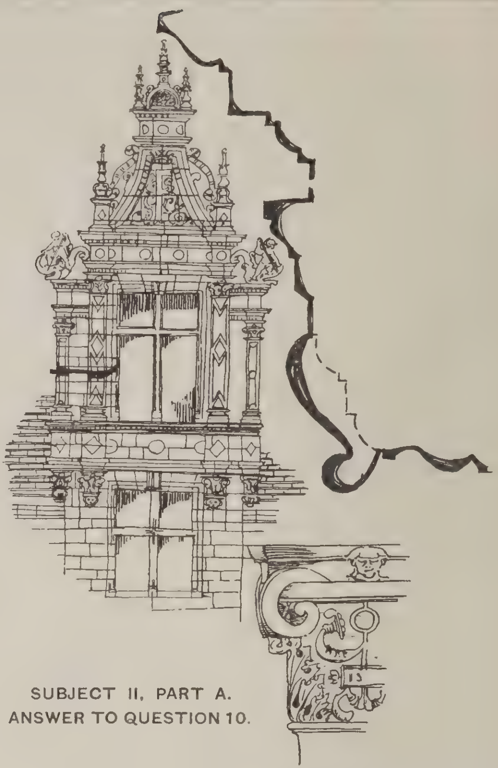


FIG A
FIG. C
FIG. B.
FIG. D.

SUBJECT II, PART A. ANSWERS TO QUESTION 9.



SUBJECT II, PART A. ANSWER TO QUESTION 10.

R.I.B.A. EXAMINATIONS.

Model Answers by A. G. Bond, B.A., A.R.I.B.A.

The Final Examination.

Subject II.—THE PRINCIPAL STYLES OF ARCHITECTURE: THEIR FEATURES, MOULDINGS, AND ORNAMENT.

[*Time of examination, two hours. Maximum number of marks, 75. Every candidate in Division A to answer Question 9.*]

A.—Classic and Renaissance (continued).

9. *Sketch to a large scale various systems of fenestration in a Renaissance building, having entablature and pilaster treatment, in which it is impossible to bring the soffit of the windows below the main architrave of the building.*

There are many solutions to this problem but they can be divided into four main systems, namely:—

i. By raising the level of the main cornice where such a window occurs and treating it with a separate pediment. Fig. A, from St. Catherine's Hall, Cambridge, affords an example of such a treatment.

ii. By omitting the architrave of the main cornice between the pilasters on each side of the window in question. This is also illustrated by Fig. A.

iii. By stopping the main entablature at the window itself. This treatment would only be adopted in the case of very large windows, such as that shown in Fig. B, which is from Greenwich Hospital.

iv. By letting the main entablature run across the window and lighting the upper part of the room by a separate window, either in frieze (as Fig. C, an example from St. Mark's Library, Venice), or above cornice (as Fig. D, which is from St. Maria della Salute, Venice).

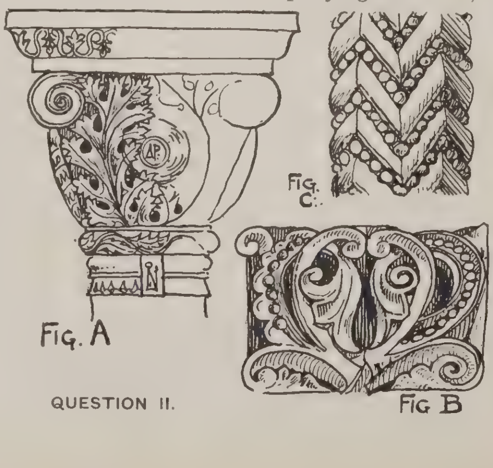
NOTE.—It was not absolutely necessary in answering the above question to give actual examples, but it would always be preferable to do so in such a case.

10. *Sketch to a large scale an enriched dormer window with pilaster treatment of French château type standing above the main cornice of the building. Show mouldings and ornament.*

The example given is a very typical one from the Château de Chambord; it is from the "keep," the main cornice being situated just below the lower window in the illustration. Details of the mouldings comprising the head of the dormer with the entablature immediately above it and of one of the capitals are given.

11. *Sketch to a large scale characteristic examples of Byzantine and Romanesque ornament.*

To a large extent the amount of work put into this question would depend on the time at the candidate's disposal. It would be well therefore to leave such a question until the last. Most candidates would find it impossible to do more than the amount indicated by the accompanying sketches, which comprise a Byzantine capital from Sta. Sophia, Constantinople (Fig. A), and two examples of English Romanesque work (Figs. B and C)—a voussoir from the west doorway of Rochester Cathedral, and part of a shaft from St. Peter's, Northampton.



QUESTION II.

B.—Medieval.

(Every candidate to answer Question 12.)

12. *Sketch, about one-quarter of full-size, three examples of stone or wood bosses of roofs.*

See illustrations: *a* is a wooden boss from the roof of Palgrave Church, Suffolk (a Perpendicular example); *b* is a Decorated example from Ely Cathedral; *c* is a Transitional example from the stone groining of the south aisle of Oxford Cathedral.

13. *Draw, full size, four examples of hood moulds to windows. Give the section of the mouldings and the carved or moulded termination.*

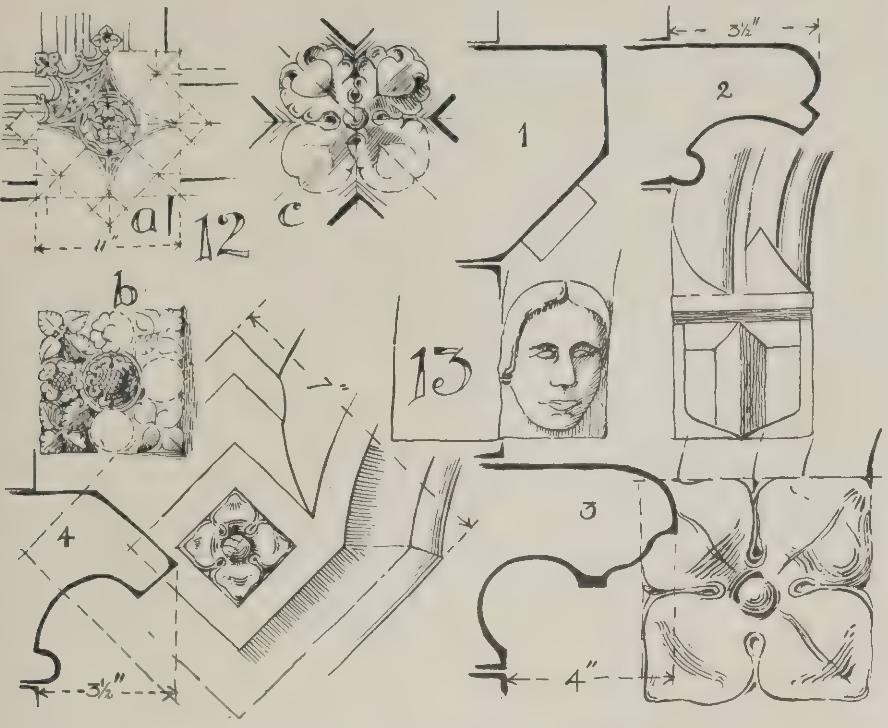
See illustrations: 1 is of Norman date, from Burnley Church, Yorks; 2 is Early English, from Barkby Church, Leics.—an example of the mask ornament which was frequently used in the earliest periods of Gothic; 3 is a Decorated example showing the typical form of the hollow moulding and the wave moulding formed by filleting the Early English form of bowtell (the stop in this case is the four-eaved flower, a common ornament of this period); 4 shows the angular form which was very commonly employed in the Perpendicular period and the most typical form of stop employed throughout the Perpendicular and Tudor periods, consisting of the label moulding returned and mitred four times upon itself so as to form a square.

14. *Draw to ½-in. scale the open timber roof of a church or hall, transverse and part longitudinal section to be given, and some of the principal details full size.*

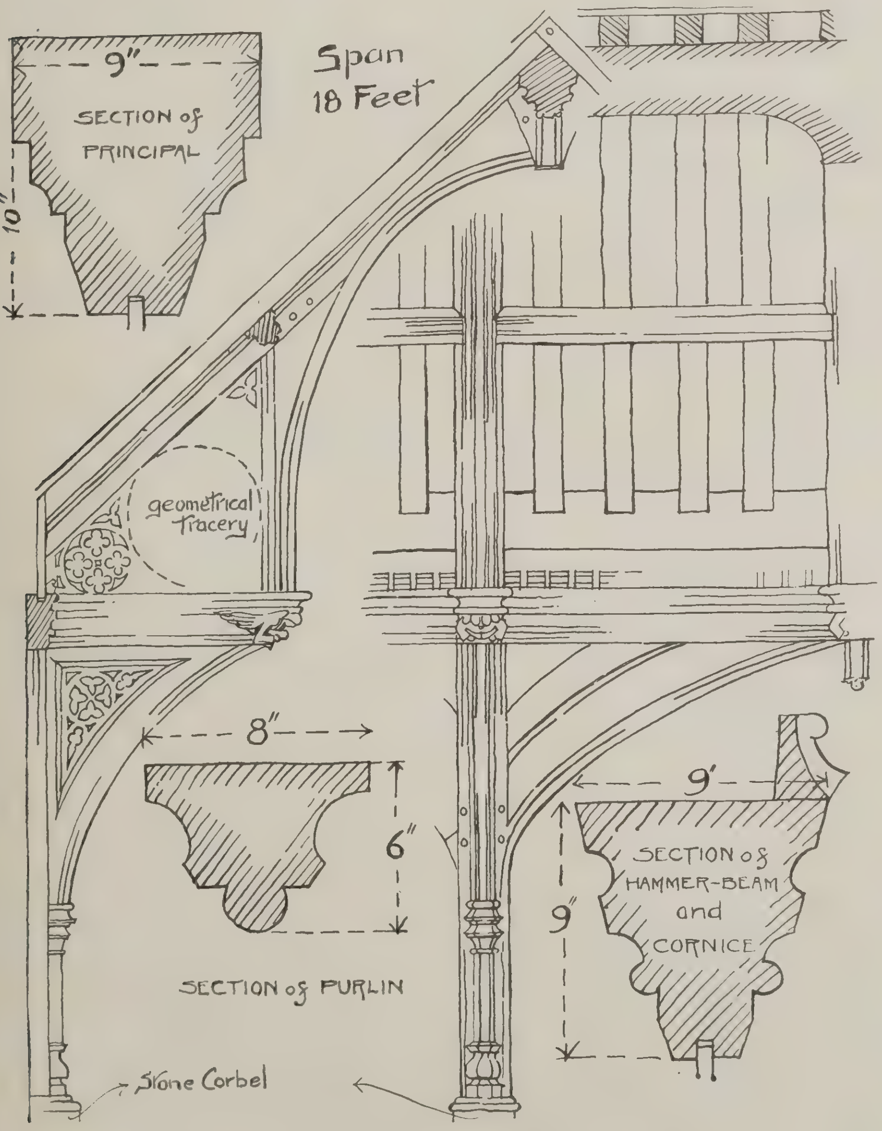
See accompanying illustration of hammer-beam roof truss from the church at Trunch, Norfolk.

(To be continued.)

[*Answers to the questions set in the Intermediate Examination were given in our issues for July 11th, July 25th and August 8th last, and to Subject I. and part of Subject II. of the Final Examination in the issue for September 5th.*]



SUBJECT II. PART B. ANSWERS TO QUESTIONS 12 AND 13.



SUBJECT II., PART B. ANSWER TO QUESTION 14.
R.I.B.A. FINAL EXAMINATION, 1906.

TIMBER CHURCHES IN NORWAY.

At one time there were no fewer than 700 timber churches in Norway, but only 24 now exist—fantastic relics of many centuries ago. The first impression suggests Chinese influence; but, in reality, there has been nothing of the kind, the churches being simply a Norwegian development of the Romanesque basilican plan. There is the usual nave, chancel and apse, but a novel feature is the open passage—the "svalgang"—round about the whole. This is no doubt an adaptation of a similar feature in domestic buildings, and served the purposes of a vestibule and a store for skis, &c., for a far-travelling public in a sparsely settled country. But whence the roof rider and dragons' heads? They also are native. The people who built these churches built viking boats, or had done so before they were converted. Now, they decorated their church gables after the manner of the prows of their ships. To detail and decoration they gave the greatest attention and care; as witness the work to be seen in the richly carved door-posts, the chairs, and other woodwork in their churches—exhibiting Celtic influence in the earliest examples, and Anglo-Saxon and Norman in the later. The construction is very solid. Large round posts are used as main supports, with tongued planks or staves between, from which the term "stave-kirke" arises. All "stave" churches date from 1000 to 1500 A.D.—that is, from the introduction of Christianity to the Reformation. They were built for the Roman Catholic ritual and have but little provision for lighting. Small holes in the clearstory permit a meagre light to filter down. The windows that show are modern, incongruous and unfortunate alterations.

The oldest church still standing is said to be one in Urnaes in Sogn, while the least restored is the church of Borgund in Laerdal: this latter dates from the 11th century, though the passage was added in the 12th. The other churches have been much altered and restored. Thus the church of Lom consists of two, pieced together, and is further disfigured with a spire and windows. The church of Fortun in Sogn has been moved to Fantoft, near Bergen, and much restored, but not always correctly: the "svalgang," with its too open postwork, has lost much of the character of stability and protection. The church of Hitterdal in Telemarken is restless and grotesque, but a notable and bold piece in spite of the very incongruous windows: it was built in the 12th century, and restored in the 50's.

The church of Hopperstad, in Sogn, dates from the 11th century, but was restored in the 60's and looks rather new.

The church of Gol is the one mostly seen by tourists, for it has been removed to Bygdoe, near Christiania, where there is an open-air museum of old Norwegian buildings. It, too, has been much restored, at the expense of King Oscar II.

It is worth noting that there are no "stave" churches outside of Norway. There are, certainly, a few remains in Sweden, just enough to show that both these peoples built on the same lines. But whereas, in Sweden, timber building gave way early to masonry, in Norway the traditions of wood construction have been carried down to the present day. It is true that after the 14th century they forgot, or neglected, to build artistic churches. But they did build dwellings and storehouses that are models of good construction well designed.

Correspondence.

Labour Conditions in London and New York Compared.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—Your notes on the above in last week's issue are excellent. It happens that I have just returned from a month's visit to New York—renewing an acquaintance after an absence of some years. I have had good opportunities for spending much time amongst the handicraftsmen of that city, and I do not think they are called upon to work harder than the average man in London. I have inspected many extensive workshops in New York, and the accommodation provided for the workers in them is distinctly superior to the majority of our own. It is the custom of the workers—an admirable custom—to breakfast before commencing work, which begins at 8 a.m., and, with an hour's recess at noon, is continued till 5 p.m., except on Saturdays, when work finishes at mid-day. The foremen declare that their men get through rather more work in eight hours than our own do in nine, though they generally observe that this is chiefly due to a better system of supervision and to the aid of more labour-saving machines. But in spite of this (I rather doubt its accuracy) 98 per cent. of the representatives of the building trades in New York are Europeans—born and bred—and the best of them are of British or Scandinavian birth.

Particular reference was made in your leader to the navvy, whose recognised pay in New York City is a dollar and a half a day (6s. 3d.). He is, almost without exception, Italian by birth. As to working harder than the navvy here, after extensively watching him I assert that he does not. In the enormous quarries at Carrara, where the same class of men only receive a couple of lira (1s. 7d.) a day of longer hours, I am perfectly sure the toil is more excessive.

True it is that, taking it all round, the purchasing power of a dollar (4s. 2d.) is not nearly so great in New York as it is in London—house rent especially being enormously high. But the actual necessities of life (save clothes) may be procured at about the same rate as in this country.

Strikes are the great drawback to the building trades in New York. If it were not for these, intelligent men have told me they would be infinitely better off there than in the British Isles.—Yours truly,

EXETER. HARRY HEMS.

Girls' Secondary School, Aigburth Vale, Liverpool.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—In your review of the competition for the above you state that according to the conditions of the competition cloakroom accommodation had to be provided for 100 juniors and 300 seniors, and that all the premiated designs wisely compromised the accommodation to 200 for each cloakroom. One naturally supposes that the Education Committee, who published these conditions, knew what they required, and did not intend 100 to mean 200, nor 300 to mean 200. Although one has every confidence in Mr. Frank G. Briggs as an assessor, is his award quite satisfactory to those competitors who, probably thinking there must be some sound reason for giving in the conditions the accommodation required in each cloakroom, worked hard to produce a plan which met those requirements, although fully realising that a more symmetrical plan could be produced by making the cloakrooms accommodate an equal number of children; this they would not do for fear that their drawings might be passed over because they did not conform with the conditions. Those who draft conditions and instructions for competitors cannot be too careful, and it should be clearly stated therein that either the conditions are to be rigidly carried out, or that they are only suggestive to enable competitors to form a general idea of what is required. When the former is the case, assessors should be instructed not to consider any designs which do not conform to the conditions.

If specific conditions are going to be ignored by assessors when making their awards, competitions will become nothing more nor less than chances, instead of fair trials to see who can produce the best solution of a problem.

I am in no way interested in this particular competition, nor do I know anything about it beyond what I have read in your paper, so my growl is not that of a disappointed competitor.—Yours truly,

SIDNEY F. HARRIS, F.R.I.B.A.

NORTHAMPTON.

Notes on Competitions

Premises for Leven Reform Co-Operative Society, Ltd.

Three weeks ago we made some comment on the conditions of the above. The competition closes this week, but it may be interesting to give the following particulars which we have received from a correspondent:—Leven is a small town about eighteen miles across the Firth of Forth from Edinburgh, and about four miles east of Wemyss, which, it will be remembered, had recently an unsatisfactory school competition. Leven's resident population is, roughly, four or five thousand, but there is a large influx of summer visitors, catering for whom is a "staple industry." The buildings recently erected mostly appear to bear the imprint of the same hand, and the same features are also evident in a number of small towns and villages in the vicinity. "It may therefore be easily judged," says our correspondent, "what success an intending competitor is likely to have—the whole county of Fife, indeed, having an unenviable reputation as far as competitions are concerned."

Free Library at Hither Green.

The Lewisham Public Libraries Committee have received designs from twelve local architects for the new library to be erected at Hither Green. The designs are now under consideration, and a report in regard to them may, perhaps, be presented at this week's meeting of the Borough Council.

Burton Police Station.

At the last meeting of the Burton Town Council a discussion took place as to the new police station which is to be erected in the borough. The General Purposes Committee brought forward a report on the matter, and Councillor Rowland, speaking on behalf of the committee, said it was thought better that the work should be put into the hands of an architect rather than be done by the borough engineer and surveyor (who, he might mention, was in agreement with the committee on this point). They also thought it best to leave it to the local architects. If they threw the competition open they would be deluged with plans, and in this connection he mentioned Swadlincote's experience in the matter of its Carnegie library, for which 87 designs had been submitted. It was decided that the committee's recommendation should be carried out.

Standard Colour Card.

Our readers will recollect that some months ago Messrs. Pinchin, Johnson & Co., Ltd., varnish, colour and paint manufacturers, of Billiter Street, E.C., instituted a competition with the object of establishing a Standard Colour Card. The competition was open to everyone, and each competitor was supplied with envelopes containing small colour slips—four slightly differing shades of 60 separate colours. From each set of four shades competitors had to select the one which they considered to be most correctly corresponding to its name—"lemon chrome" or "olive green," for example; and each slip selected was stuck down in its proper place on the card supplied. A standard card was then built up in accordance with the selections made, and the competitors whose cards were nearest to the standard were awarded the several prizes. These awards are as follows (number of votes in brackets):—

First prize (£50), William E. Taylor, Canterbury (42); second prize (£15), J. Standem Adkins, London (41); third prize (£15), Edward Y. Saunders, Barnstaple (41). Winners of £1 each:—C. H. Brightiff, Southampton (40); H. J. Capell, Clapham Common (40); C. H. Durber, Newcastle, Staffs. (40); F. J. Herbert, Newcastle-on-Tyne (40); W. Ward, Sheffield (40); R. J. Black, Ballinasloe (39); L. H. Crumpler, Wareham (39); E. A. Dyson, Tadcaster (39); F. Green, Thames Ditton (39); E. G. Hill, Minehead (39); Miss A. J. Ronald, London (39); L. Shrubsole, Maidstone (39); W. A. Webb, London (39); H. Williams, Altrincham (39). Winners of 8s. 6d. (14 share last 6 prizes of £1):—B. Bishop, Darlington (38); J. S. Cable, London (38); J. M. Davidson, Greenock (38); W. Dicken, Birkenhead (38); S. Edwards, Barnstaple (38); L. Fletcher, Wigan (38); T. Green, Thames Ditton (38); L. Judge, London (38): N. Keighley, Wakefield (38); J. L. Parker, Burton-on-Trent (38); A. G. Rhind, London (38); A. H. N. Rogers, Bolton (38); F. W. Shaw, Whitley Bay (38); W. P. Wyatt, Bognor (38).

Messrs. Pinchin, Johnson hope shortly to be able to send out their Standard Colour Card, which should be of much service.

In Praise of Competitions.

We take the following from the "American Architect" for September 15th, just to hand:—"It is our own belief that competitions are very far from being the unmitigated evil their opponents would like to have them held. A competition always is a success from the winner's standpoint, and there never was, and probably never will be, a competition so well and fairly managed as not to be declared a failure by some, if not by all, of the defeated contestants. Very much is made by opponents of the system of the vast aggregated cost of the time and labour wasted in a large public competition, as if such waste were peculiar to architectural competition, instead of being the one common element in every field of human endeavour. . . . .

The aggregate loss of a number of real-estate agents all trying to sell the same piece of property is also large, just as is that caused by the futile manœuvring of many lawyers, each trying to secure the same client. If the lawyer, the manufacturer, the architect, the real-estate broker, object to the burden that bears more or less equally on all labouring men, the remedy is entirely in their own hands. It is wholly by their own volition that they enter competitions; each, if he prefer it, can sit quietly in his office and do only such work as comes to him through and because of his acquired reputation—if he has any."

Suburban Houses, Bristol.

A competition among Bristol architects for designs of suburban houses costing from £700 to £1,000 the pair was instituted recently by the Corporation. The awards have just been made as follows:—First premium (£15 15s.), Messrs. Rowley and Norton; second premium (£10 10s.), Messrs. La Trobe and Weston; third premium (£5 5s.), Mr. P. Hartland Thomas.

List of Competitions Open.

Date of Delivery	Competition.
Sept. 28	COTTAGE HOMES AT CLEADON and receiving house at workhouse, for Guardians of South Shields Union. Particulars from J. W. Coulson, Union Offices, South Shields.
Sept. 28	SEWAGE DISPOSAL SCHEME FOR ELLESMERE. Premium of £20. Particulars from R. E. Lloyd, clerk to Urban District Council, Ellesmere.
Sept. 29	REBUILDING OF HENSHAW'S BLIND ASYLUM AT MANCHESTER. Limited to Manchester architects. Premiums £100, £50 and £25. Assessor, Mr. John Holden, F.R.I.B.A.
Sept. (last week)	PREMISES AT LEVEN, for Reform Co-operative Society, Ltd. Particulars from D. C. Wilson, secretary.
Oct 1	ALPHABET COMPETITION. Prizes of £20, £10 and £5. For particulars see "Architectural Review."
Oct. 20	SEWERAGE SCHEME FOR HIGHBRIDGE, Somerset. Premium £20. Particulars from W. C. Shier, Surveyor to the U.D.C., Highbridge.
Oct. 22	SCHOOL AT GAYWOOD, King's Lynn. Particulars from Secretary, County Education Office, 57, London Street, Norwich.
Oct. 31	BOURSE AT CAIRO.—Premiums of £E250 and £E100. International competition. Designs to be submitted to the "Corporation des Agents de Change," Cairo, Egypt.
Dec. 14	FOUNDLING HOSPITAL, MONTEVIDEO.—Four selected designs in preliminary competition to be awarded £212 each; first premium of £742 in final competition. Particulars from Consulate-General for Uruguay, 5 & 6, Clement's Inn, London, W.C.
No date	LIBRARY AT FRIBOURG, Switzerland (International competition.) Particulars from "La Direction des Travaux Publics," Fribourg.

NEW CYCLE WORKS.

Among the most recent contracts for constructional work entrusted to the St. Pancras Ironwork Co., Ltd., is that in connection with new offices and works at Redditch which have been built for the Enfield Cycle Co., Ltd. Here there is a total floor space of upwards of three acres. The east block, measuring about 300ft. in length, is devoted to the general offices and covers an area of about 10,000 sq. ft., the first floor being occupied by offices, board-room, show-room and sale department. The north side of the building is allotted to the machine shop, 214ft. by 50ft., adjoining which are frame stores, rough stores, and the view-room and finish stores—on the ground floor, with an extensive building shop on the first floor. In the centre portion the plating and polishing shops occupy the ground floor, and the enamelling and cleaning shop the first floor, covering an area of about 9,000 sq. ft. The first floor of the south wing is the largest clear area, free from walls; it is covered by 66 north light trusses in four rows, these being entirely supported by columns and providing a clear area of 22,000 sq. ft. for stores and finishing shop. The ground floor of the south wing is occupied by the stock room, 150ft. by 50ft. Along the gable ends, running from north to south wings, is a continuous balcony and bridge about 150ft. in length, from which each wing of the building is accessible from the offices. There are nine flights of staircases. Altogether the building has involved the use of between 300 and 400 tons of metal (including 172 steel trusses) and 26 timber trusses.

The work has been carried out from plans by, and under the supervision of, Mr. Francis F. Baylis, architect, of Redditch, the building contractors being Messrs. C. G. Huins & Sons, of Pool Place, Redditch.

Views and Reviews.

Mitchell's Building Construction.

The elementary course of Mitchell's "Building Construction" has now reached its seventh edition, and the advanced course its fifth. These two new editions of the work have been published at the same time, and consequently are better related to each other than before. It is evident that the books are popular. There are probably two reasons for this: first, their comparative cheapness; and, secondly, their use as text-books by the large classes at the Regent Street Polytechnic, where Mr. Mitchell is lecturer on building construction, and also headmaster of the Technical School. In former issues we have somewhat severely criticised these two books as new editions of them appeared, but, as is only natural with such a subject as building construction, the books could not be regarded as wholly bad; there is a good deal in them that can be praised, and that undoubtedly makes them worth their small cost. It is the unthankful duty of the critic, however, to find fault, and he does not feel himself relieved of his task with the new editions now before him. Primarily the deficiencies are traceable to the fact that the books have been compiled (as too many text-books are) to meet the requirements of the South Kensington examinations. As each set of papers is issued, any question that an examiner chooses to ask, if not directly answered in a text-book, seems to lead book-compilers to insert a paragraph to meet it in their next edition. In this way books grow by a steady accretion of heterogeneous items, without scheme or system. If the student knows sufficient practical construction to enable him to gain a good start in life, it matters very little whether an examiner this year or next asks the meaning of some term seldom used in the building trade or belonging to some small district. It is far more important that the student should have a sound practical knowledge than that he should lose marks by not being able to answer catch questions. The authors of what presume to be standard text-books are too often thus inclined to pursue the shadow and miss the substance. Too frequently, also, authors are teachers in schools, out of touch with current practice, and their time is so fully occupied that they cannot keep up to date or extend their knowledge. Only very few men, of course, would be able to master all the branches of building construction, and it is too much to expect Mr. Mitchell to possess a specialist's knowledge of applied mechanics and structural engineering, chemistry and physics of building operations, and all the many crafts and professions allied to architecture. It is true Mr. Mitchell has had the assistance of two of his colleagues at the Polytechnic to revise the chemical and electrical portions of his work, but this does not go far enough. In order to secure efficiency in this respect, it would be necessary for them to become part authors.

Defects are by no means so numerous in the elementary course, which consists more or less of plain, straightforward descriptions of simple things, without extended discussion of the theory and underlying principles of construction, and we can unhesitatingly recommend the elementary volume as a primer for students; but we cannot recommend the advanced course, which presumably aims at giving the student a thorough knowledge of building construction, to serve him in his future career. It is valuable as a supplementary work for consultation, but it is by no means all-sufficient for the student. In many ways it gives him a glimpse of the obvious, but it more often than not, in our opinion, sets the wrong point of view before him. It appears to be so thorough that he would be misled into supposing that it contained the whole truth, whereas often the information is wrong, or is beside the mark. In particular, the information about building materials and applied mechanics is deficient. There has been considerable improvement of recent years in constructional knowledge, and it is to be regretted that the book should not have kept pace with this advance. This is perhaps only to be expected, for it is against human nature and the interests of the publisher for a book to be entirely rewritten. That is, however, what is required to be done with Mitchell's "Building Construction," notwithstanding the attempts that have been made in this edition to bring it up to date by including the specifications of the Engineering Standards Committee, a chapter on reinforced concrete construction (which, however, is next to being useless), and the extensions in many other directions. The work, undoubtedly, should be purchased by students, but it should be regarded as supplementary to other standard books on the various branches of building construction.

"Building Construction and Drawing," by Charles F. Mitchell, assisted by George A. Mitchell. First Stage (or Elementary Course), 7th edition, price 3s.; Stages 2, 3 and Honours (Advanced and Honours Courses), 5tn edition, price 5s. 6d, London: B. T. Batsford, 94, High Holborn, W.C.

Birmingham's great electrical scheme is practically completed. The total outlay on the new power station and other developments is something like £400,000. The new power station in Summer Lane is one of the largest buildings of its kind in the country. The buildings stand on between four and five acres of ground, and the Birmingham Town Hall could with ease be placed in the engine-room. The work of erecting the new station has taken about two years.

PECULIARITIES OF WOODS THE JOINER USES.

By W. Young.

A careful, methodical mechanic can invariably save himself much unnecessary time, trouble and hard work by simply making ordinary use of the knowledge that experience has taught him of the nature of the wood he is handling—indeed, there can be no surer method of distinguishing the good from the inferior workman than by noting how they separately watch their material during the progress of their work. A careful workman, provided always sufficient time is allowed, will arrange the various details and adapt the grains of his panels and wider portions of his work so as to bring out to the greatest possible advantage all the natural perfections of the wood.

It is, in the first place, of the greatest importance that the workman who has the selecting and cutting of the material required for joinery work should be not only a joiner, and a good one at that, but should also possess a thorough knowledge of timbers, a qualification not possessed by all joiners. The slightly-increased remuneration paid such a man is more than recouped.

The loss occasioned by a careless selection results in great waste of material and men's time, ofttimes occasioning the necessity of casting out much of the material when a considerable amount of labour has been bestowed upon it before it reaches the hands of the joiner, and yet the latter will have to bear the brunt.

A considerable responsibility, therefore, rests upon the cutter out, as besides avoidance of sap, defective knots, shakes of various sorts, there are the grains of the wood to be carefully matched in cutting off for polished or stained work. **The neglect of such matching** often causes rejection of finished work by architects. In painted work, of course, matching of grains is not necessary, but for all hard wood work the grains should be so arranged as to be in the same position as the natural growth of the tree. At times in some wood it is almost impossible to detect with the eye the run of the grain, especially in wood without figure, but the joiner can readily discover it by trying with his plane on the face. It is customary with joiners when planing up their stuff to put on it when planed **the face mark,** but it is only few who put the mark determining the run of the grain, although the one mark is almost as necessary as the other. Some wood of course will smooth either way, but none so quickly or so easily as the way of grain, and it is in making use of this knowledge the good joiner will save himself much time and trouble. In fact, it is almost incredible what amount of time, consequently money, can be saved by ordinary attention being bestowed on these details, trifling to the inexperienced, especially considering the fact that builders are so frequent in their complaints as to the excessive cost over their estimates for their joiner's work. It is a great pity, even from the purely economic view of the matter, that a stricter observance of these details is not more often insisted on.

Although the occupation of a joiner cannot be classed under the head of dangerous trades, his life is a short one, the average being not more than 45 years; and in the case of the joiner continually in a shop much less, a fact easily proved by referring to death statistics published annually by the various trades unions in the woodworking industries. Doubtless this mortality is due mainly, if not entirely, to the nature of the calling. The diseases from which joiners suffer most—especially such as are constantly working on hard woods—are consumption and asthma, both of which are contracted through **inhalation of the fine dust** arising from and kept in circulation by the use of glass paper, noticeable more particularly with hand-rail hands, and especially with mahogany rails. A joiner working on such is scarcely ever free from symptoms of colds, being, from the nature of his work, compelled to bend closely over same, contracting the muscles of the chest, and thereby accentuating the evils arising from the inhalation of the dust, which in some cases is undoubtedly poisonous, and more especially so from the best qualities of mahogany, such as Spanish or Cuba, the pores of which are filled with a white chalky substance: this matter is not found in mahogany of the common sort.

Teak is another of the hard woods from which a joiner is liable to suffer, and to him it is one of the most objectionable of woods, containing, as it does, such a quantity of grit and iron, making it very hard and costly to work, taking at least double the time of any other of the hard woods, never repaying the cost of labour bestowed, besides the enormous wear it entails on the joiner's tools, the up-keep of which is a serious item to him. Another and a more serious objection is that, owing to a poisonous acid contained in teak, it is only on very rare occasions the joiner comes out of his job without some poisoned wound caused by splinters or cuts, and there is no doubt that this acid is of a very virulent nature. It is owing to its presence that teak is so largely used in good-class stable fittings, as it is well known that horses leave it severely alone after one or two attempts at gnawing. Men who are constantly engaged in working it are at times subject to **a dangerous skin disease,** and cases are by no means uncommon where men have become so permeated with the complaint that the finger nails have rotted away and paralysis has set in, supposed to be due only to the constant handling of this wood.

Walnut is, I believe, one of if not the most favourite of the hard woods with the joiner, expensive, doubtless, from all points, but it is doubtful if there is any wood which so well repays the cost of labour bestowed upon it when finished.

English oak, now very difficult to obtain owing to what amounts to the almost criminal neglect of its cultivation, is a wood not much in favour with the joiner. It entails much hard work in preparing and finishing; it is generally more or less damp, consequently strips or roughs up in the smoothing, and, owing to the great care a joiner has to keep tools from rusting, it never will become with him a favourite wood. Even with all the pains possible taken to clean up, the finish to him is never satisfactory. Riga wainscot, on the contrary, does not rust the tools nor strip in the cleaning up, and although the cost of the material exceeds either Austrian or American wainscot, it far exceeds both in appearance and value when finished.

Coming to woods of a softer description and in more general use, Archangel, Petersburg and Onega are the principal and preferable of the yellow deals, and Christiania of the white deals, and among the pines, American yellow. The last-named has now been raised to such a prohibitive price as to become almost as scarce in a joiner's shop as some hard woods; but, doubtless, of all soft woods it is the best—clean, fairly free from tendency to shakes, and few knots. It is easily distinguished by short dark, hair-like lines running in same direction as the grain. It is very easy to work, but requires great care, being so easily bruised and damaged when finished. For interior framings, panels, mouldings, &c., it would be difficult to surpass it; but the American does not mean the English joiner to partake of the luxury unless well paid for. That which would be saved in labour from the ease with which it is worked is more than lost in first cost.

Archangel, Petersburg, &c., are doubtless the most suited for all joiner's work requiring strength and durability for external joinery, in particular frames, jambs, windows, &c.; but here again prices for the best qualities are so high that inferior qualities of same are used and Swedish goods generally given to the joiner, much to his annoyance, so much time being often spent in making defects good and getting rid of sap that would more than repay for the extra £4 or £5 per standard asked for best qualities.

American white or bass wood is not a very satisfactory wood to the joiner unless specially selected, as there appear to be two distinct classes, one soft and easily worked, and the other cross-grained, tough and almost as difficult to work as some of the hard woods; but the selected well repays for labour bestowed. Very much of the furniture now sold as satin walnut is nothing more than stained bass wood.

Oregon, or "Horrible" Pine so named by the joiner, is a most objectionable wood to work, and is doubtless the most unsatisfactory to look at when finished, for no matter what are the pains taken, and care bestowed, the grains being so different in texture, "very hard and very soft," an even surface is never obtained, and the joiner is thankful it is a wood very deservedly ostracised by the builder.

Kauri pine should, to my thinking, be placed amongst the hard woods, and doubtless would be, except for the fact that, as regards its first cost, it is less than best qualities of Archangel or Petersburg; but considered from the labour point of view it is worth at least double either of these woods. It is utterly impossible to mortise without boring, or to scribe by hand pressure on the tools. It can certainly be got up to a very nice finish and will take either walnut or a mahogany stain, but it must not be given to the joiner with expectancy. Labour will come out at the same price as on yellow deal.

Pitch Pine is another of the woods a joiner does not desire. It is difficult to work; cloggy to the tools and to the glass papers, considerably more costly in labour than yellow deal; when thoroughly dry very hard and brittle; and splinters invariably result in gatherings and festers to manipulators.

There are very many woods too numerous to mention used by the joiner, but for the soft woods the writer would ask, Archangel or Petersburg yellow best quality, American yellow pine and selected American white or bass wood, and Christiania white deal: for hard woods, Spanish or Cuba mahogany, Persian or Virginia black walnut, Riga wainscot, and Kauri pine.

THE SCHLOSS, LIMBURG-ON-THE-LAHN. DRAWN BY WALTER MILLARD.

THE AGE OF IRON.

It is one of Ruskin's luminous generalisations—points of permanent light in the tempestuous expanse of his life's literary work—that Britain possesses in a high degree one art, and one only, that of working iron. It may indeed be put broadly that the use of iron is the one line of material workmanship in which the English-speaking race is creatively original. In architecture proper we have created nothing: we have improved on no successful style of the past, and produced no vitally good combination. With all our wealth we rather fall behind past ages in respect of ambition to build; but we have really done a new thing in our structures of glass and iron. If it be asked what is characteristically British in the way of architecture we can but point to our railway stations. The answer is not exactly calculated to cheer the native lover of architecture; but it is a datum to be recorded like another; and it brings out the force of Ruskin's proposition.

It is worth while, once in a way, to contemplate the work of our hands—the Babylon we have builded in Scotland.

The Forth Bridge

is not merely a prodigy of copious and patient labour, or a costly joint-stock undertaking, or a unique complex of mechanical calculation—it is a great visible and permanent mark on the face of Nature, always with our favourite material, in a land and an age in which great visible and permanent creations have been singularly few, considering the available resources.

This lack of enduring impressiveness in the ordinary run of our public works has hitherto been the great difference between our polity and that of the ancient Empire which is so often compared with ours. The Romans were stupendous builders. A few fragments convey to the appreciative sense as vivid an idea as could a reconstruction in the mind's eye of the face of the ancient world. The ruin of a bath in a town in an out-of-the-way province, as was Roman Britain, reveals an amount of deliberate labour greater absolutely (to say nothing of the relative opportunities) than goes to the construction of almost any sort of public building in these days. The secret lies finally, of course, in the profound difference between the political and economic conditions then and now—the difference between a world of Imperial military administration and slave labour on the one hand, and a government by the people and a life of competitive but non-military industrialism on the other. Freedom has revolutionised values, and the giving to each man an imprescriptible estate in his own labour has meant thus far a restriction of the general estate in great tangible works.

But the Forth Bridge is at least one work vast as any Roman aqueduct, and far transcending in its difficulty the simple skill which Roman energy propelled to its tremendous undertakings. It will stand to show for many a day—a worthy monument of the age of iron, alike in its visible entity and its social function of bringing together a nation's provinces.

Nevertheless, it has to be confessed that the extremities of the great bridge, with their gaunt stone supports, need all the dignity of the central towers to relieve their æsthetic poverty. Looking at them, one recurs to the question raised about the locomotive—If it had been invented by the Italians of the Renaissance what would it have been like? If the Forth Bridge could have been built by Hadrian or Trajan, or in the Middle Ages, what would have been the aspect of those scraggy extremities? In the one case as in the other there is but one easy answer—they would have been much more beautiful.—Extract from an article in the "Dundee Advertiser."

MARISCHAL COLLEGE, ABERDEEN.

To-morrow His Majesty the King will open the fine block of granite building known as Marischal College, Aberdeen—an extension of the University. This is a most important work. The design throughout is noteworthy, while in point of size the building comes next to the Palace of the Escurial, near Madrid, which is the largest granite building in the world. Marischal College has a frontage of 400ft. facing Broad Street, and a general height of 60ft. It accommodates the administrative offices of the University, the science library, and lecture-rooms for law, education, and modern languages, and lecture-rooms, laboratories, and museums for agriculture, geology, medicine, physiology, and comparative psychology. It is built entirely of light-grey Aberdeen granite, which looks almost pure white when seen in sunshine. There is a long series of powerful-looking buttresses, very severe and restrained till they reach the top storey of the building, when they burst into a rich array of pinnacles and pierced and fretted battlements. Crowning the whole is a great tower.

The architect of the building is Mr. A. Marshall Mackenzie, A.R.S.A., F.R.I.B.A., the contractors being Messrs. D. Macandrew & Co., of Aberdeen. Mr. George Reid acted as clerk of works, and Mr. A. Dawson as the architect's surveyor.

The total cost of the building has been over £200,000, and, with the exception of £46,000 granted by the Government, the whole of this large sum has been raised by voluntary subscriptions.

Prof. Patrick Geddes, of Dundee, describes the building thus: "The tamely conventional modern Perpendicular college has been reorganised as far as might be by a master hand. Porch and staircase, vestibule and ante-chamber lead through long perspectives as of a cathedral into the noble aula walled with rose-coloured granite blocks and pointed with gold, and upon the former tower he has piled another hundred feet of four-square precipice, from which there leaps and crystallises a spiry fretted crown of glittering pinnacles. Here is one of these rare points of the world where we may see the beginnings of a fresh phase of architecture, for here, and perhaps for the first time, a neo-megalithic builder has struck a new note of emotion, and risen from sternness or solemnity into hope or cheer."

The following is taken from an Aberdeen paper, giving a reporter's interview with a representative of the builders in regard to the arrangements for the opening dinner:—

> The seating of such a multitude of people? Oh! here you are. We have 4,500 Austrian bentwood chairs, by Thonet Brothers, the celebrated makers. These have been supplied by Davidson Brothers, cabinetmakers, Union Street, and were imported direct to Aberdeen via Hamburg. They made two or three shiploads, so much space did they require. "Splendid chairs these; you can't break them." And so saying Mr. Smith seized one of the chairs and threw it high in the air—they are quite light—and when it fell on the floor it immediately rebounded, as if it were of indiarubber, and suffered no damage whatever.

Our Plates

New Dining Hall, Wellington College.

This design was submitted to the college authorities last year as one of four competing designs. As the plan shows, it comprises a dining hall with master's dining room and common room, matron's department, kitchens and all servants' offices on the ground floor, the basement being planned to give matron's linen and store rooms, stewards' offices and store-rooms, a large servants' hall, wine and beer cellars, cold-storage rooms, lavatories, etc. On the first and second floors are masters' billiard-room and guests' bedrooms, matron's rooms and maid-servants' bedrooms, tea-rooms for boys, bath-rooms, lavatories, etc. The design has been purposely assimilated in materials and general treatment to the character of the older buildings of the college. The intended materials were red bricks and Portland stone, with green Westmoreland slates for the roof. The colonnade or covered way which extends across the front and joins on the west with the Combermere block, shown on the right-hand side of the view (built some years ago from the design of Sir A. Blomfield and Sons), was one of the stipulated features of the scheme. The designs were judged by a committee of the governing body, without a professional assessor, and the competition (which was limited to Messrs. Charles J. Blomfield, T. W. Cutler, Sidney R. J. Smith and Edward Warren) was decided in favour of the first-named gentleman, whose design, also that of Mr. Warren, was exhibited this year at the Royal Academy. Mr. Blomfield has already been responsible for various buildings for the college.

CHINESE CARPENTERS.

Naturally pre-eminent among the skilled craftsmen of China, the carpenter stills maintains the leadership. Though almost invariably wedded to the use of the tools of his ancestors and to their methods, judged by results he is more efficient in his line than most foreign-trained fitters and machinists are in theirs, though a constant diminution of the difference is in progress. In judging the performance of the native workmen, it is almost impossible to avoid the popular bias that addiction to their own methods and tools invariably bespeaks fatuous conservatism. Though this is in many cases true, it will often be found on careful observation that what has passed for a stubborn blindness to the virtue of innovation is in reality a keener perception of comparative merits than the judge himself was aware. This is particularly true of Chinese carpenters. While most of their commonest tools differ in some radical way from our own, it is never safe to assume the superiority of the Western product. Their small axe, for example, is a beautifully balanced tool, and they are remarkably adept in the use of it, being able to work as true a surface therewith as can be obtained with an adze in the hands of the white man. On heavy work it is customary for two to hew together on opposite sides, striking alternative blows. Both hands are used and the recover is over the shoulder, alternative right and left. There is a freedom of swing with an accuracy of delivery which is a delight to watch, and the rapidity of blows is almost bewildering.—Mr. Barrett Smith in the "Engineering Magazine."

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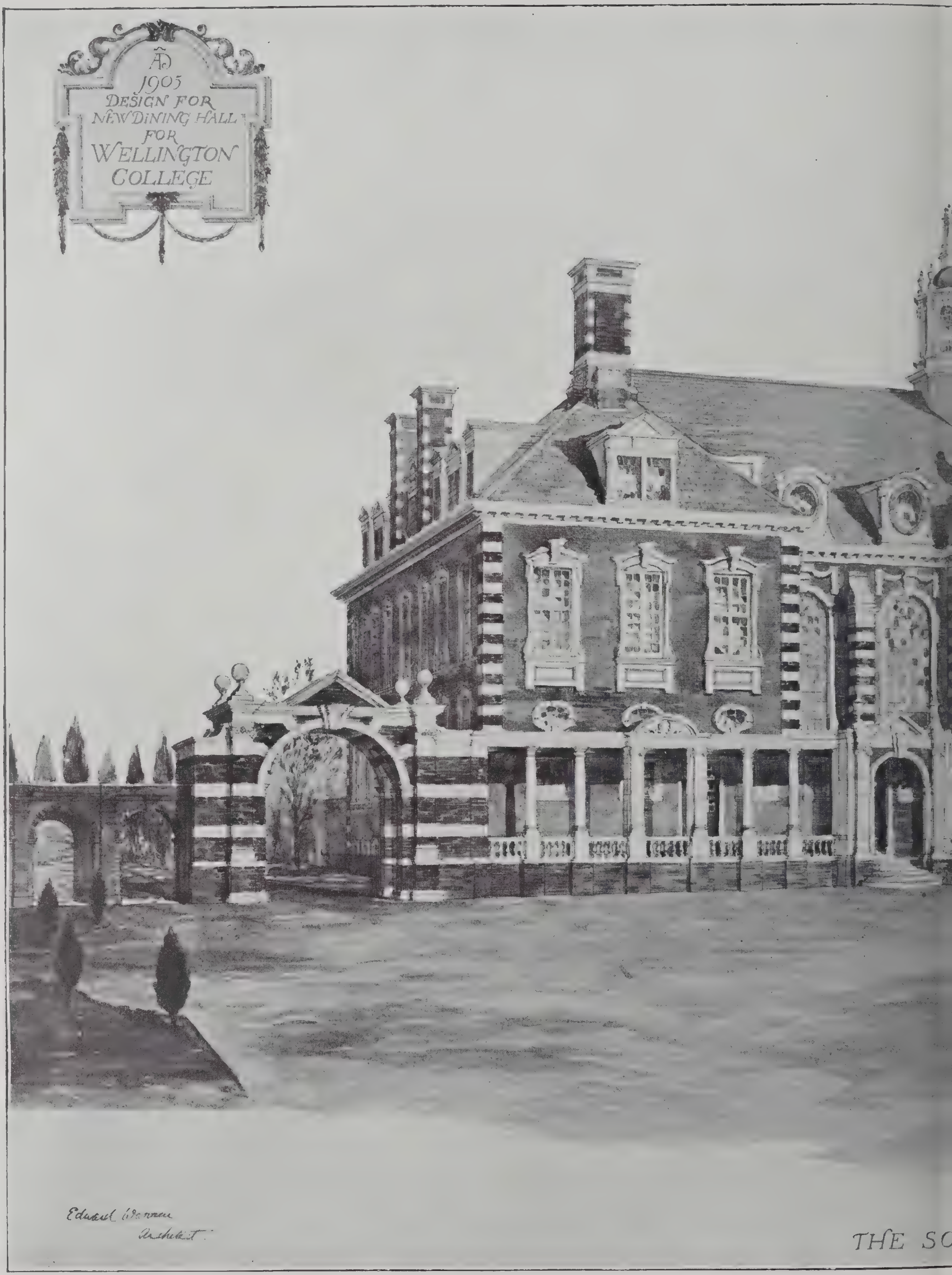
Supplement to
THE BUILDERS' JOURNAL AND ARCHITECTURAL ENGINEER,
Wednesday, September 26th, 1906.



FRONT.

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Enquiries Answered.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional, or legal matters.

Correspondents are particularly requested to be as brief as possible.

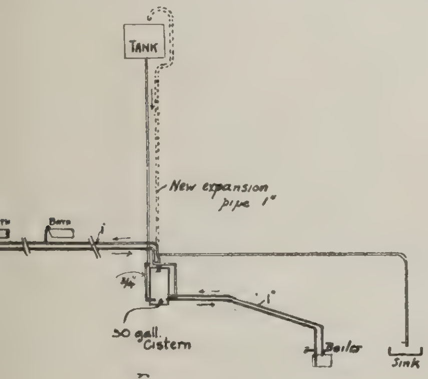
The querist's name and address must always be given, not necessarily for publication.

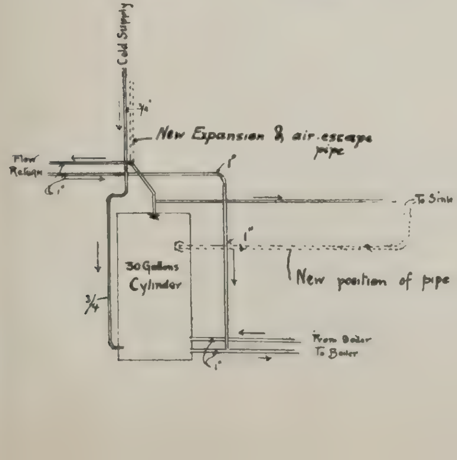
Defective Hot Water System.

PIETERMARITZBURG—NATAL writes:—"The accompanying diagram shows a heating apparatus which does not work properly. At times there is an abundant supply of hot water, which sometimes flows up the flow pipe and at other times flows up the return pipe. The boiler holds about two gallons, with the return pipe carried down in and to near the bottom of the boiler, the flow being taken off the top. Some days no hot water is obtainable, not even the cylinder becoming hot, although a large fire is used, and one might suppose, from the position of the pipes, that a short circulation should take place through the cylinder without passing through the whole system. In order to prevent the water filling up the return pipe, the cold supply has been reduced from 1″ to ¾″ before it enters the bottom of the cylinder. Another expedient has been resorted to in taking a branch off the return pipe just before it enters the boiler through the wall to the outside, and fixing a tap on same, so as to draw the cold water off as soon as the fire is lighted, and thus, if possible, induce the hot water to rise up the flow pipe, but neither when this is closed or open does the system work properly. The pipes are 1″, and the total length from boiler to highest point is about 70ft., with a 30 gallon cylinder. Can you suggest a remedy to put the system in working order?"

As the circulation is completely stopped at times, there must be a piece of wood, rag, cork, &c., that occasionally jams in one of the pipes, and is only dislodged by an accidental knock on the pipe, or by a sudden rush of water when a tap is opened quickly, or by some similar action, or the cooling of the hot metal. The remedy for this is to disconnect all the pipes, to see that all are clear, by drawing through them a wire with a small scraper and a mop at one end, examining and washing the cylinder, emptying it through the various nozzles, and coupling up again carefully. Or the cylinder may have become air-bound by the bubbles that escape from all heated water; the best remedy for this is to fit an expansion and air-escape pipe from the flow pipe, as shown by the dotted lines. This pipe must be led up to a greater height than the water-level in the main cistern and then turned down over it, so that nothing can settle in the pipe and all the water of expansion can run into the cistern. Or, if there be a branch on the side of the cylinder, say 6ins. from the top, the pipe to the sink tap had better be connected to it. Then, if one of the bath taps be opened for a minute or two three or four times a day, the air should escape from the top of the cylinder. If the end of the cylinder be at all dished down, or if the pipe and its coupling project down into the cylinder, there will be trouble with air, and a dome top with its nozzle completely outside is the best cure. If new pipes cannot be fitted at once, a temporary cure for the days when the apparatus will not work can be had by tying up the ball valve of the main cistern, and then opening the drain cock on the return pipe near the boiler and all the other pipes until the cylinder is empty. Rapping the cylinder should tell where the water-level is, and also help to dislodge the rag, &c., that plugs the pipe. Then the drain cock must be shut, and the ball valve untied, when water will again flow into the cistern, driving out the air through the open taps until water reaches them, when you will close them, and the cork will start on another voyage. There is no need to draw the fire for this; but if anyone is reckless or nervous, it had better be drawn. The reversal of current in the pipes is quite usual; whenever a tap is opened, water flows to it from all pipes that lead to it, and the flow due to heat is stopped for the time. When the tap is closed the water again flows, but in the direction it then finds easiest. The proportion of water in boiler to water in cylinder is small for English practice, but may suit in warmer Natal. Your proportion is 1 to 15, whilst here 1 to 10 is more usual. You will not gain much by putting in a larger boiler with the same proportion of heating surface to water contents. The heating surface, and especially that of the fire, must be in proportion to the total quantity of water in boiler, pipes, and cylinder. A small, round or conical, vertical boiler is the best; and if the cylinder can be put in one of the bathrooms there will be less strain on it, and the air-bubbles will escape better, while the flow to the taps will be as quick as when it is lower down, for it is the height of the main cistern that gives the driving pressure. There is no need to reconnect the pipe to sink (as shown by dotted lines) if the expansion and air pipe be fitted.

INGENIEUR.





Eating Away of Leadwork.

H. writes: "The lead cames on the inside of the windows of a billiard-room erected last year are covered with a white powdery substance, which partly dissolves with the condensed water on the inside of the panes, and is said to be oxide of lead. This is rapidly eating the lead away. The walls are panelled in oak to within 2ft. of the cornice, and the ceiling has exposed oak joists and beams. The plaster on the upper parts of the walls and on the ceiling is 'Granite Plaster,' as supplied by the Granite Silicon Plaster Co., of London. The lead glazing is fixed in iron casements set in stone mullions and transomes, and the oxidation is worse at the windows where there are opening casements, and shows only slightly at two small fixed lights in an ingle-nook. Enquirer has had experience of lead oxidising from the acid of oak where the two were in contact, but never had a case of this sort. Any information as to the probable cause will be gladly received."

It is quite possible that your lead casements are perishing from the action of rainwater and condensation water upon the lead. Soft water containing much oxygen often exercises considerable effect upon new lead. An oxide of lead is formed which is partly soluble in water. It is impossible, from the slight details given, to say whether this is causing the trouble in your case; but, if so, you will, I think, find that the white oxide will shortly cease to be produced. The manufacture of lead casements is in the hands of a very few firms, and is a highly technical business. I should, therefore, suggest that you call in the advice of a manufacturing firm having special experience in this class of work.

F. S. I.

Sketching near Blackpool.

BARNSLEY.—JUNIOR writes: "Can you give particulars of any sketching in the vicinity of Blackpool? I should like to make use of two or three days of a short holiday for this purpose."

There is very little architectural work in this district. Near the village of Upholland are the remains of a Benedictine priory, consisting of a high ivy-clad wall with five square windows in it. There are traces of arches built into a house close by. The church has nave, aisles and chancel, and a massive low tower; on the south side are some good windows, and inside are some brasses, a circular tower arch and oak benches, dated 1635, and some old glass. Orrel Hall, now a farmhouse, is of Elizabethan date.

H.Y.M.

Old Architecture Around High Wycombe.

HIGH WYCOMBE.—SCALE writes: "Which are the best examples of old work around High Wycombe, Bucks—say within a radius of about 20 miles—suitable for measuring and study?"

High Wycombe is not a good centre for the study of architecture. Although many interesting buildings fall within the 20 mile radius prescribed, those most suitable for useful study are on the extreme limit. Oxford is so situated, and furnishes well-known examples of every period, which it is needless to particularise. Other places which should be visited are Wing Church, with its Saxon apse and groined crypt, said to be 7th century work; Stewkley and Hemel Hempstead, fine Norman churches; Dunstable Priory, Norman nave and west portal, 13th century west front, 14th century tower; Leighton Buzzard, 13th century church with fine central tower and stone spire; Haddenham, 13th century church, near which the remains of Notley Abbey are incorporated in a farmhouse; Aylesbury, 13th century church spoiled externally by restoration; High Wycombe Church, with a 13th century south porch with good carved caps, &c.; Dorchester, Oxon, priory church very rich in 14th century work; Chesham, small cruciform 14th century church; St. Albans, abbey church containing work of all periods, abbey gatehouse, now grammar school; Tottern Church with good oak roof, *circa* 1500. Of domestic work there are Dinton Hall, *temp.* Henry VII.; Ockwells Manor, near Maidenhead, a fine 16th century timber house; Chequers Court, near the Kimbles (*circa* 1566); Hartwell House, near Aylesbury (Jacobean); Lucas Almhouses, at Wokingham, a charming brick building; Wotton House, near Aylesbury, late 17th century. There are other fine houses, but as tourists do not frequent Bucks and the local gentry have not abandoned their seats to farmers, as in so many other counties, access to most of the historic houses is difficult. E. G.

Roman Remains near Colchester.

WISBECH.—E. S. writes: "I know a field on Mersea Island, near Colchester, where there are known to be some Roman remains buried. About 60 years ago excavations were made and some arches and walling were found. The arches were not disturbed, but some of the walling was pulled down and the materials used in a garden wall now standing. There are several Roman remains on the island, and this particular field is generally supposed to have been the site of some important place. (1) Are Roman remains worth anything and would they pay for digging up? (2) If dug up, would the lord of the manor or anyone like that claim them? (3) If you are not in a position to supply the information asked for, to whom could I apply? Would the curator of the Colchester Museum do?"

(1.) Roman antiquities in England usually consist of the more solid parts of buildings which were almost totally destroyed by the uncivilised hordes which swept over Britain when the Roman dominion came to an end. The most valuable remains consist, as a rule, of tessellated pavements, and are of great interest when *in situ*; but I have never heard of a case in which a money profit has accrued when they have been unearthed. (2.) It is hardly likely that the lord of the manor will have a legal right to anything you may dig up, but I have known a case in which the Crown claimed important remains as "treasure-trove." (3.) The curator of your local museum would, no doubt, give you some hints, but the county archæological or antiquarian society would probably take a greater interest in the matter. F. S. I.

R.I.B.A. Intermediate Examination.

SOUTH SHIELDS.—C. writes: "Where can I get tuition for the above examination about South Shields, Newcastle, or Sunderland? I want names of private tutors or any colleges teaching same."

Armstrong College, Newcastle-on-Tyne.

Connection to Sewer.

TEAK writes:—"In a district where the building authority is a rural district council it is proposed to build two cottages. As the sewer at present ends a considerable distance from the site, which is by the roadside, I should be glad to know the greatest distance a builder can be compelled to lay a drain in order to make a connection to a public sewer. There is ample space available for cesspools in the rear. Also, would the council be bound to extend the sewer to within a reasonable distance of the site? From where would the measurements for the above distances be taken as regards the cottages?"

By the Public Health Act, 1875, section 16, the local authority are empowered to make a sewer, such as you suggest, if they think well. Section 21 of the same Act gives the property owner (under certain conditions) the right to connect his drains to the sewer. Section 23 further empowers the local authority to enforce such a connection, provided that the "sewer is not more than one hundred feet from such house." This section also gives the local authority power to construct a new sewer, should they consider it necessary, and to apportion its cost among the owners who benefit. F. S. I.

Prospects for Carpenter in New Zealand.

BLACKBURN.—J. V. J. writes: "What prospects are there for a carpenter and joiner in New Zealand?"

Employment is brisk with almost all the building trades in New Zealand. We advise our correspondent to consult the Emigrants' Information Office, 31, Broadway, Westminster.

Book on Farm Buildings.

SLEAFORD writes: "Is there a book on farm buildings, from an architect's point of view, showing the construction of detail? I already have the book on farm buildings by A. D. Clarke, but this is not what I want."

The only other works are: Professor J. Scott's "Farm Buildings," J. B. Denton's "Farm Homesteads," and H. Stephens's "Farm Buildings."

Foreign Architectural Publications.

LONDON, W.—BOOKS writes: "What is the cost of single copies of the "Berliner Architekturwelt," and where can it be obtained in London? Is there a somewhat similar publication in Austria? If so, can I get it in London? Is there a somewhat similar publication in France? Please also give names, cost, publishers, &c., of any books of photographs, drawings, &c., of Renaissance and modern Parisian buildings and details."

The "Berliner Architekturwelt" is published monthly by Ernst Wasmuth, Markgrafenstrasse 35, Berlin, W. 8, price 24 marks per year (about 2s. a copy). There is no similar publication that we know of in Austria, though there is the "Architektonische Runschau." In France there is "La Construction Moderne," published at 13, Rue Bonaparte, Paris, weekly, price 75 centimes (yearly subscription abroad 35 francs). We do not know whether you can obtain copies of these papers anywhere in London, though some can be seen at the Patent Office, Chancery Lane, as also the following:—"Schweizerische Bauzeitung," 5, Dianastrasse, Zurich II., weekly (foreign subscription 25 francs a year); "Deutsche Bauzeitung," Königgrätzerstrasse 104, Berlin, S.W., II., twice weekly (foreign subscription 24 marks a year); "Atlas zur Zeitschrift für Bauwesen," Wilhelmstrasse 90, Berlin (this is splendidly produced: it can be had in London from Williams and Norgate, 14, Henrietta Street); and "Allgemeine Bauzeitung," Andreasgrasse 1, Vienna VII., 1, quarterly (foreign subscription 20 marks a year). With reference to the desired book of photographs, drawings, &c., of modern Parisian buildings, very possibly there has been such a publication, but we cannot give you any precise title or particulars.

Current Market Prices.

FORAGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	14	0	1	16	0
Clover, best...	per load	4	4	0	4	15	0
Hay, good	do.	3	17	6	4	2	6
Sainfoin mixture	do.	4	0	0	4	7	6
Straw...	do.	1	8	0	1	14	0

METALS.

		£	s.	d.	£	s.	d.
Standard Copper	per ton	88	0	0	88	10	0
Do. Strong sheets ...	do.	88	0	0	89	0	0
Lead, soft foreign... ...	do.	18	7	6	18	10	0
Do. English	do.	18	10	0	18	15	0
Do. pipes...	do.	21	5	0	21	10	0
Do. sheets	do.	20	15	0	21	0	0
Galvanised Corrugated sheets	do.	12	12	6	12	15	0
Spelter G.M.	do.	27	10	0	27	15	0
Angles, Scotland	do.	6	15	0	6	17	6
Bars, do.	do.	7	15	0	8	0	0
Marked bars, Staffs. ...	do.	8	10	0	8	12	6
Common bars, do. ...	do.	6	7	6	6	10	0
Angles, M'boro.	do.	6	7	6	6	10	0
Joists. M'boro	do.	6	5	0	6	7	6
Angles, Midlands	do.	6	12	6	6	15	0
Joists do.	do.	6	15	0	6	17	6
Girder plates, Midlands ...	do.	7	7	6	7	10	0
Angles, Foreign, c.i.f. Thames	do.	6	7	6	6	10	0
Tees do. do. do.	do.	6	10	0	6	12	6
Joists, do. do. do.	do.	6	3	6	6	5	0
Channels do. do. do.	do.	6	7	6	6	10	0
Plates do. do. do.	do.	6	17	6	7	2	6
Tin, Foreign	do.	184	0	0	184	10	0
Do. English ingots ...	do.	184	10	0	184	15	0
Zinc, sheets, Silesian, f.o.b.	do.	32	0	0	32	10	0
Do. do. V.M. do.	do.	32	10	0	35	0	0

TIMBER.

		£	s.	d.	
Deals, Archangel, Yellow dry 2nd, 3×9	per std.	14	10	0	—
Do. Abo, Yellow, 1st & 2nd, 2½×7	do.	10	0	0	—
Do. Ljusne, Yellow, 3rd, 3×9	do.	14	15	0	—
Do. Fredrikshamn, Yellow, 1st & 2nd, 3×4½	do.	8	0	0	—
Do. Norrkoping, Yellow, unsorted, 2½×7	do.	9	5	0	—
Do. Riga, White, 1st & 2nd, 3×11	do.	10	0	0	—
Do. Quebec, Spruce 5th, 3×9	do.	7	15	0	—
Do. St. Petersburg, Yellow, 3rd, 3×11	do.	8	10	0	—
Do. do. do. do. 3×9	do.	8	10	0	—
Do. Skelleftea, Yellow, 1st, 3×3	do.	9	5	0	—
Do. do. do. 2nd, 2½×7	do.	10	0	0	—
Do. do. do. do. 3×3	do.	8	10	0	—
Do. do. do. 5th, 3×9	do.	9	10	0	—
Do. Skonvik, Yellow, unsorted, 3×5½	do.	9	0	0	—
Do. do. do. do. 3×4½	do.	10	0	0	—
Do. Sornas, Yellow, unsorted, 2½×7	do.	9	10	0	—
Do. Ubeaborg, Yellow, 1st & 2nd, 4×9	do.	10	5	0	—
Do. do. do. do. 2½×8	do.	9	10	0	—
Battens, Abo, Yellow, 1st & 2nd, 2×7	do.	9	5	0	—
Do. Blankaholm, Yellow, 1st, 2½×6	do.	8	15	0	—
Do. Batskarsnas, Yellow, 1st, 2×9	do.	10	10	0	—
Do. Ljuene, Yellow, 3rd, 2×9	do.	14	15	0	—
Do. Mesane, Yellow, 3rd, 2×9	do.	11	5	0	—
Do. do. do. do. 2×11	do.	11	5	0	—
Do. Norrkoping, Yellow, unsorted, 2×3½	do.	8	15	0	—
Do. do do. do. 1×7	do.	9	5	0	—
Do. St. Petersburg, Yellow, 3rd, 2×5	do.	9	0	0	—
Do. do. do. do. 2×4	do.	9	15	0	—
Do. do. do. do. 1×5	do.	8	10	0	—
Do. do. do. do. 1×4	do.	8	0	0	—
Do. do. White, 3rd, 2½×6½	do.	7	15	0	—
Do. do. do. do. 2×6	do.	8	0	0	—
Do. do. do. do. 2×4	do.	8	15	0	—
Do. Skelleftea, Yellow 1st, 2½×4	do.	9	15	0	—
Do. do. do. do. 2×3	do.	9	15	0	—
Do. do. do. 2nd, 2½×4	do.	9	10	0	—
Do. Sornas, Yellow, unsorted, 2×6	do.	8	15	0	—
Do. do. do. do. 2×4	do.	9	15	0	—
Do. Wyburg, Yellow, 1st & 2nd, 2×4	do.	10	0	0	—
Flooring Boards, Gothenburg, Yellow, 3rd, 1¼×7 ...	do.	0	13	0	—
Do. do. do. do. 1×7	do.	0	10	9	—
Do. Johannedal, White, 1st & 2nd, 1×6	do.	0	10	3	—
Do. Mon, Yellow, 2nd, 1×6	do.	0	11	3	—
Do. Skonvik, Yellow, 1st, 1×6	do.	0	11	3	—
Do. do. do. 2nd, 1×6	do.	0	10	6	—
Do. do. do. 3rd, 1×7	do.	0	8		

The Labour Market

Board of Trade Returns for August.

Owing to our last week's issue having had to go to press before the publication of the Board of Trade labour returns, we were unable to include the usual notes under this heading in our "Contractors' Supplement." The Board of Trade reports for August are as follows:—

Employment in the building trades continued dull during August, but was on the whole better than a month ago and a year ago.

In London

employment was better than a month ago, but not so good as a year ago. Returns received from 37 London employers show that in the last week of August 7,841 workpeople were paid wages, as compared with 7,035 a month ago, and 8,607 in August, 1905.

From Trade Union returns relating to carpenters and joiners it appears that the percentage of unemployed in London at the end of August was 5·5, as compared with 7·8 a month ago, and 5·5 a year ago. With plumbers the percentage for August was 7·5, for July 14·3, and for a year ago 8·7—a considerable improvement being shown as compared with a month ago. With bricklayers a slight decline was shown, but with all other branches, particularly with builders' labourers, a marked improvement took place as compared with July.

The Provinces.

Returns from 68 Employers' Associations in towns outside London show that in these towns employment was slack generally, and showed little change compared with a month ago and a year ago. The Trade Unions report that employment with bricklayers and masons was dull, and showed a decline as compared with a month ago. With carpenters and joiners it was still slack, but better than a month ago and a year ago. The percentage unemployed of Trade Union carpenters and joiners in the whole of the United Kingdom was 5·1, as compared with 5·3 a month ago and 6·5 a year ago; with plumbers the percentage was 7·5, as compared with 8·9 a month ago and a year ago. With slaters, plasterers and builders' labourers there was a slight improvement as compared with a month ago; with painters little change was shown.

In the Northern Counties

employment on the whole was quiet, and about the same as a month ago and a year ago. With painters a slight falling-off was reported. In the Wear district employment with plasterers continued bad.

In Yorkshire

employment on the whole continued quiet. Some improvement was shown, however, at Sheffield, Rotherham, and Leeds.

In Lancashire and Cheshire

employment was reported as fair in most branches. With carpenters and joiners and painters it was slack.

As regards the Midlands and Eastern Counties,

in Derbyshire employment was quiet, and about the same as a month ago; in Nottingham and the Leicester district it improved, except with bricklayers. In Norfolk a decline was reported, and employment continued generally slack throughout the Eastern Counties.

As regards the Southern and South-Western Counties,

employment with stonemasons in the Plymouth district improved somewhat, but with painters a decline was shown. At Bristol it continued dull. There was a general improvement in the South Wales district.

In Scotland

there was an improvement with bricklayers at Greenock and Paisley, and with masons at Edinburgh and Dundee.

In Ireland

at Belfast, Dublin, and Cork employment was dull, and worse than a month and a year ago.

THE ROTHERHITHE TUNNEL.

A highly interesting visit was paid last Wednesday by the members of the Society of Engineers to the Rotherhithe Tunnel, now in progress of construction for the London County Council. The work consists of a carriage and footway tunnel with approaches, commencing in Lower Road, Rotherhithe, and terminating in Commercial Road, Stepney. The total length is 6,883ft., of which 2,020ft. is open approach, 1,122ft. cut and cover, and the remaining 3,741ft. tunnel, lined with cast iron and concrete. There are four vertical shafts, one on each bank of the river near the water's edge and one at each end of the iron-lined tunnel further inland. These shafts vary from 70ft. to 100ft. in depth, and are each 50ft. in diameter inside, the sides consisting of two steel skins, 5ft. apart, with the intervening space filled with concrete.

The tunnel proper

is circular in section, the outside diameter of the cast-iron lining being 30ft., with a thickness of metal of 2ins. under the river and 1¾ins. elsewhere. The lining is put together in rings each 2ft. 6ins. wide, and composed of 16 segments with a key-piece. The rings are held together by means of bolts through the internal flanges, which have a depth of 14ins. When the work is completed these flanges will be hidden by the concrete lining, which will have an internal diameter of 27ft. The faces of the iron at the joints are all machined for a width of 12ins. and the segments fit metal to metal. The remaining 2ins. at the internal edge of the flanges are recessed for caulking with lead and rust cement. The tunnel is being constructed by

the shield system

under compressed air. A small pilot tunnel, 12ft. 6ins. external diameter, was first driven across the river and it is being followed by the main tunnel. The strata met with are known as the Woolwich and Reading beds, and consist chiefly of clay with beds of sand and shells, overlaying a bed of marl or rock of a chalky nature. Below the last occur a compact bed of pebbles and a thick bed of sand.

The cut and cover portion of the work consists of a brick barrel 1ft. 10½ins. thick, surrounded with concrete. The internal diameter of the brickwork is 27ft., the same as the concrete lining in the iron tunnel.

On the open approach the section consists of concrete retaining walls with battering face, surmounted by a brick parapet. A concrete invert fills the space between the footings of the side walls, and upon this the roadway is to be placed. The tunnel faces on each side of the river are built of red Aberdeen granite surmounted with a massive granite parapet, the surface of the whole being polished. Both the cut and cover portion of the tunnel and the open approaches are made water-tight with asphalt.

Present Condition of Work.

At the present time the approaches and cut and cover portion on the south side of the river are nearly completed. All the shafts have been sunk and the tunnel has been driven rather more than halfway across the river. The contract was let to Messrs. Price and Reeves early in 1904, and the work is expected to be completed in 1909. The total cost will be about £1,000,000.

The engineer-in-chief is Mr. Maurice Fitzmaurice, C.M.G., M.I.C.E., chief engineer to the London County Council, the resident engineers being Mr. E. H. Tabor, M.I.C.E., assisted by Mr. A. G. Drury, A.M.I.C.E.

Obituary.

Mr. J. H. Davies, senior member of the firm of Messrs. John H. Davies & Sons, architects, Chester, died recently, aged 75.

Bankruptcies.

Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—adjudication.

DURING THE WEEK ending Sept. 21st twenty-three failures in the building and timber trades in England and Wales were gazetted.

F. MUNNS, builder, Leagrave. R.O., Sept. 11.

T. R. AXCELL, builder, Southend-on-Sea. R.O. Sept. 14.

R. J. WRIGHT & Co., builders, Hitchin. R.O., Sept. 11

A. COATES, painter and decorator, Shildon. R.O., Sept. 13.

F. W. PHILPOTT, builder, Canterbury. Liabilities, £365; assets, £229.

LONGCAKE & CLEMINSON, plumbers and glaziers, Leeds. Adj., Sept. 11.

E. CHAMBERS, joiner, Nottingham. Liabilities, £333; assets, £10. P.E., Oct. 5.

J. MITCHIE, builder, Ballater. Liabilities, £692; assets, £322· deficiency, £422.

J. PHILLIPS, builder and contractor, Cardiff. Gross liabilities, £355; £305 to rank; deficiency, £292.

G. P. GILLHESPY, builder, Boldon Colliery. P.E., Newcastle-on-Tyne C.C., Oct. 18, at 11. R.O., Sept. 12.

T. WHALLEY, painter, Darwen. First meeting, O.R.'s, Preston, Sept. 26, at 12. P.E.. Blackburn C.C., Oct. 3, at 9.45.

C. FREEMAN, painter, Barnsley. First meeting, O.R.'s, Barnsley, Sept. 26, at 10. P.E., Barnsley C.C., Sept. 26, at 10.30. R.O., Sept. 13.

A. COX, journeyman joiner, Burnley. First meeting, O.R.'s, Preston, Sept. 26, at 11.30. P.E., Church Institute, Burnley, Oct. 26, at 10.45.

G. E. BATES, builder and contractor, Sheffield. First meeting, O.R.'s, Sheffield, Sept. 26, at 12. P.E., Sheffield C.C., Oct. 4, at 2. R.O., Sept. 10.

E. D. MULLIS & Co., builders' merchants, Loughborough. Unsecured creditors, £2,595; creditor partly secured, £4,925; deficiency, £3,615.

J. L. DUNN, builder and contractor, Sunderland. First meeting, O.R.'s, Sunderland, Sept. 26, at 3. P.E., Sunderland C.C., Oct. 4, at 11.15. R.O., Sept. 10.

I. WATKIN, painter and paperhanger, Chester. First meeting, Crypt Chambers, Chester, Sept. 27, at 11.30. P.E., The Castle, Chester, Oct. 30, at 11. R.O., Sept. 13.

ALDRIDGE & SON, builders and contractors, Willesden Green. R.O., Sept. 1. First meeting, London Bankruptcy Court, Sept. 13, at 12.30. P.E., same, Oct. 17, at 11.30.

J. WHITEHEAD & Co., brick, lime and cement merchants, East Dulwich and Peckham. R.O., Aug. 30. First meeting, London Bankruptcy Court, Sept. 14, at 11. P.E., same Oct. 30, at 12.

A New Town Hall at Sutton Coldfield, Birmingham, has been erected from designs by Mr. Arthur R. Mayston, A.R.I.B.A., of London. The building was opened last week. It is Georgian in style, harmonising with the existing buildings in the town. The total cost has been about £12,000.

Notes and News

The New Block of Admiralty buildings facing the Horse Guards Parade will shortly be ready for occupation.

The "Mauretania," launched at Wallsend-on-Tyne last Thursday, was built in a slipway glazed on Mellowes' patent "Eclipse" system.

A New Market-Hall for Haverfordwest is to be built, at a cost of £5,000, from designs (selected in competition) by Mr. Preece James, architect, of Tenby.

Institute of British Decorators.—The first gold medal of this institute has been awarded to Sir William Richmond, more particularly for his work at St. Paul's Cathedral.

An Abridged Edition of the "Burlington Magazine" is to be issued, price 1s., a fortnight after the publication of each number. The first appearance of the 1s. "Burlington" will be on October 15th.

The Public Library at North Islington, the first of five to be built in the borough, was opened on Thursday last. It is on the "open access" system, and has cost £9,000. Mr. Henry T. Hare was the architect.

A New Ward Block has been added to the Borough Isolation Hospital, Coppett's Road, Muswell Hill. It consists of two large wards, with accommodation for 24 patients. Mr. E. J. Lovegrove, the borough surveyor, was responsible for the work, which has cost £13,000.

The New Weights and Measures Office of the City of London was opened on Wednesday last by the Lord Mayor. The building is in Whitecross Street, and has been erected at a cost of about £6,000, from designs by Mr. Sydney Perks, F.R.I.B.A., the City surveyor.

Changes of Address.—Mr. E. W. Mountford, F.R.I.B.A., is moving his office from 17, Buckingham Street, Strand, to Norwich House, Southampton Street, Bloomsbury—three doors from Museum Station, Central London Railway.—Mr. W. D. Caröe is moving his offices from 8a, Whitehall Place to 3, Great College Street, Westminster.

The Bradford City Architect's Department.—A meeting of architects in Bradford was held last week (Mr. T. C. Hope in the chair) to discuss the report on the City Architect's Department and the alleged saving effected by the department as compared with what the cost would have been if the work had been done by outside architects. Strong disapproval with the department was expressed. (See p. 140 of our issue for last week.)

The National Association of Master House Painters will hold its fourteenth annual convention in Leeds from October 9th to 12th. An interesting feature of the meeting will be the presence of a deputation from La Chambre Syndicate des Entrepreneurs de Peinture et Vitrerie, of Paris. The Association carries on an important educational work of its own, on which it has already spent more than £1,800. A national competition for apprentices exists, and between £70 and £80 are offered in prizes, whilst a School of Decorative Painting has been established at Manchester, with travelling and other scholarships, for the benefit of youths seeking instruction in the higher branches of the trade.

The L.C.C. Central School of Arts and Crafts, at 316, Regent Street, opened its eleventh session on Monday. The instruction is adapted to the needs of those engaged in the different departments of building work and the curriculum provides instruction in a wide range of artistic handicrafts. The inclusive fee for the whole curriculum is £1 1s. per session, and apprentices, learners and improvers are admitted free. The principal of the school is Prof. W. R. Lethaby. The architectural section is directed by Mr. Halsey Ricardo and Mr. Sidney B. Caulfield; structural mechanics by Mr. E. Sprague; building construction by Mr. F. Herbert Mansford; and architectural modelling and ornament by Mr. Richard Garbe and Mr. D. McGill.

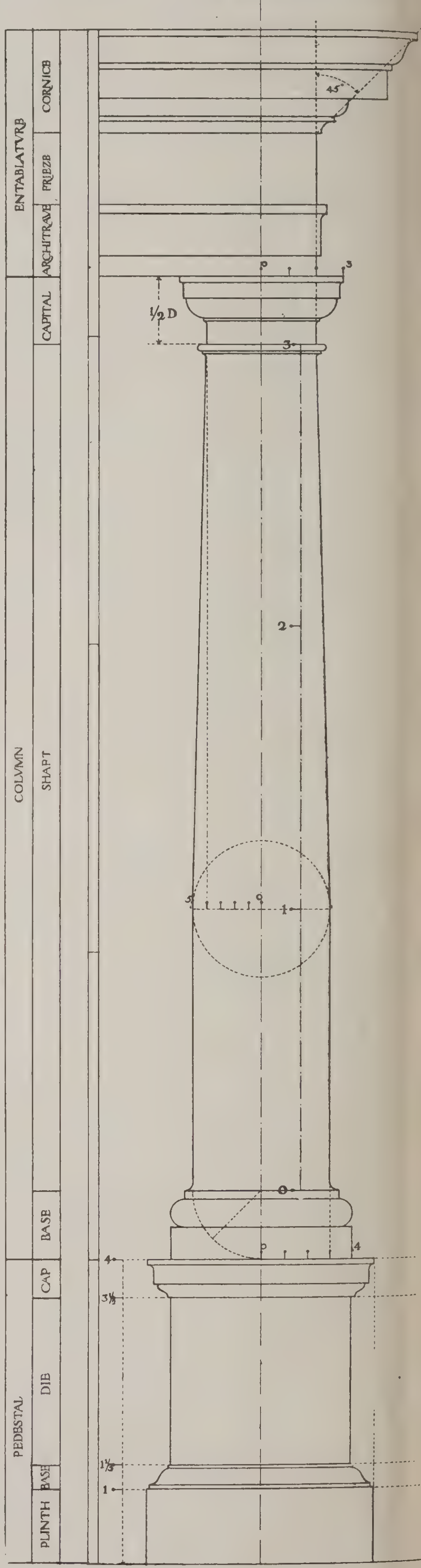
Holyrood Restoration.—Under the direction of the Office of Works, the partition in Queen Mary's audience chamber, in Holyrood Palace, which used to disfigure the south end of the apartment, has been removed. It was erected during the occupation of Charles I. As a result of the change, visitors are now able to see the chamber practically as it was at the famous interview of John Knox with Queen Mary. The ceiling bears 16 panels, which are an interesting study in heraldry, and, until the partition was removed, the design could not be fully traced. In the south wall there has been opened up a deep recess, which is supposed to have been Queen Mary's private oratory. A rich ceiling has been disclosed in a wonderful state of preservation.

A Note on Thomas Hardy.—In a "Real Conversation" with Mr. William Archer, Mr. Thomas Hardy, the novelist, has said that when he was an architect's pupil, he used to be sent round to sketch village churches as a preliminary to their restoration—which mostly meant destruction. "I feel very remorseful now," he says, "but, after all, it wasn't my fault—I was only obeying orders." It is this remorse, perhaps, that has tempted Mr. Hardy to propose that a tower be added to Holy Trinity Church, Dorchester, and present the rector with a design for it. Mr. Hardy, at sixteen, was articled to an ecclesiastical architect in the very place he is seeking to beautify. His time up, he migrated to London, where he worked first under the late Sir Arthur Blomfield (with whom he had a good grounding in Gothic), following afterwards in the wake of Scott, Butterfield, Street, and the other Gothicists. Forty-three years ago he won the Tite prize, and also an Institute essay prize "On Coloured Brick and Terra-Cotta Architecture." After that he began to drift from architecture into literature.

THE ORDERS.

We very much regret that, owing to a defect in machining, a large number of copies of our issue for last week had blotches on the illustration of "The Orders" accompanying the "Practical Notes for Architectural Draughtsmen," by Mr. Alfred W. S. Cross and Mr. Alan E. Munby. In view of this, we have considered it advisable to reprint the block in the present issue, so that those readers who are following this important new series of articles, and whose copies of last week's issue are defective, may be able to carefully study this first plate.

THE ORDERS



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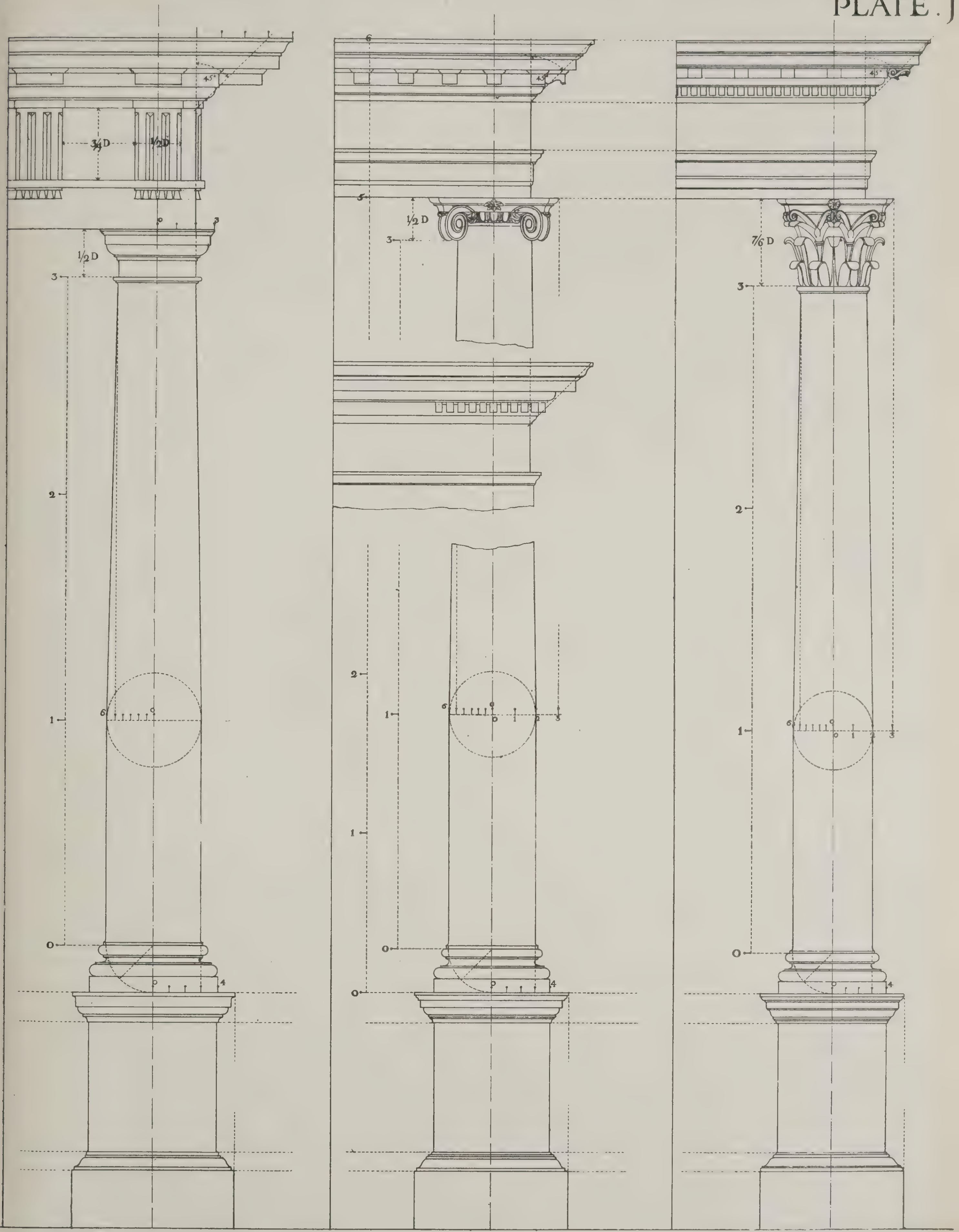

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THE ORDERS AND THEIR APPLICATION. BY ALFRED W. S. CROSS, M.A., F.R.I.B.A., AND ALAN E. MUNBY, M.A.

Complete List of Contracts Open.

WITH a few exceptions, news of Contracts Open are not repeated after they have been published once in these columns, so that readers will find particulars in our previous issues of other contracts that still remain open.

Unless expressly stated to the contrary, all deposits required for bills of quantities, &c., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair-wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

Sept. 27. Castle Caereinion.—*Erection of a new cattle building*, at the Farm, Castle Caereinion. Plans and specifications may be seen at the Farm aforesaid. Tenders to be endorsed "Tender for Building," and sent in to T. Gittins, Pool Quay, not later than Sept. 27.

Sept. 27. Ryde.—*Alterations and additions for the Isle of Wight County Education Committee, at the Ryde School of Science and Art.* Plans and specifications may be seen at the County Education Offices, Newport, or at the office of the architect, 5, St. Thomas's Street, Ryde, where all information may be obtained. Sealed tenders, endorsed "Ryde School of Science and Art," must reach F. G. Flux, secretary, County Education Offices, Newport, I.W., not later than 12 noon on Sept. 27.

Sept. 27. Stillington.—*Erection of a new elementary school*, with out offices, boundary walls, playgrounds, &c., at Stillington, near Easingwold. Contractors desirous of tendering are required to send in their names to W. H. Brierley, county architect, 13, Lendal, York, on or before Sept. 27. Sole tenders only will be entertained.

Sept, 28. West Bromwich.—*Erection of smithy* at the Walsall and West Bromwich District Schools, West Bromwich. Plans and specifications and conditions of contract may be seen at the offices of J. W. Allen, architect, High Street, West Bromwich. Tenders, under seal and marked, "Tenders for Smithy," must be sent to H. Ward, clerk, West Bromwich, on or before Sept. 28. Forms of tender may be obtained at the office of J. W. Allen No other forms will be received, The tenders will be opened on Oct. 1.

Sept. 28. Ashford.—*Supply and fixing complete of approximately* 1,284-*ft. run of all oak park fencing* 6ft. high out of ground at its Warren Lane Hospital site, for the U.D.C. Plan and specification may be seen, forms of tender and other information obtained on application to W. Terrill, surveyor, North Street, Ashford, Kent. Sealed tenders, endorsed "Hospital Fencing," to be sent to J. Creery, clerk to the Council, 11, Bank Street, not later than 5 p.m. on Sept. 28.

Sept. 29. Penzance.—*Seamen's Institute at Green Street, The Quay, Penzance.* The drawings and specifications may be seen at the offices of the architect, O. Caldwell, Penzance, to whom tenders are to be sent on or before Sept. 29.

Sept. 29. Belfast.—*Building of a wing, and for the execution of sundry improvements to the Parochial House, Ballygawley*, Co. Tyrone, for the Rev. Peter M'Shane, P.P. Plans and specification relating to the work may be seen at the Parochial House, Ballygawley, or at the offices of J. V. Brennan, architect, Belfast Bank Chambers, Belfast, to whom sealed tenders are to be delivered not later than Sept. 29.

Sept. 29. Gowerton.—*Erection of additions and alterations at the Gowerton County School*, Gowerton. Fair wages clause. Plans and specifications of the work may be seen and copies of the bill of quantities obtained by those desirous of tendering at the Gowerton Police Station, and of T. Mansel Franklen, clerk of the County Council, Glamorgan County Offices, Westgate Street, Cardiff. Sealed tenders, together with the names and addresses of two substantial sureties, are to be delivered to the Clerk of the Council not later than Sept. 29, marked outside, "Tender for Gowerton School Additions."

Sept. 29. Stourton.—*Providing and erecting 490 yards of creosoted redwood fencing, 6ft. high, round the new sewage disposal works at Stourton. Also separate tenders for about 9 yards of iron fencing, 5ft. high, including fixing at the works.* for the U.D.C. of Rothwell. Plans and specifications can be seen and particulars obtained at the offices of E. J. Silcock, M.I.C.E., engineer, 10, Park Row, Leeds. Sealed tenders, endorsed "Stourton Fencing" or "Iron Fencing" must be delivered to W. Dodgson, clerk to the Council, Council Offices, Rothwell, near Leeds, not later than Sept. 29.

Oct. 1. Cardigan.—*Rebuilding of Nos. 12 and 13 High Street*, for Mr. E. Mathias, Draper, to whom tenders must be delivered not later than Oct. 1. Plans and specifications may be seen at the offices of L. Lewis, architect, 13, High Street, Cardigan.

Oct. 1. Stratford-on-Avon.—*Alterations and additions at rear of Town Hall.*—Drawings may be seen, quantities and form of tender obtained on payment of a deposit of £1. Tenders, sealed and endorsed "Town Hall Alterations," are to be delivered to R. Dixon, A.M.I.C.E., borough surveyor, Municipal Offices, Stratford-on-Avon, not later than Oct. 1.

Oct. 1. Beverley.—*Erection of extensions to the East Riding of Yorkshire County Council offices*, Beverley. Plans and specifications are to be seen at the offices of B. S. Jacobs, F.R.I.B.A., Bowlalley Lane, Hull, and bills of quantities obtained on payment of £1 1s. Tenders to be sent into J. J. Bickersteth, clerk to the East Riding County Council, Beverley, at or before 10 a.m. on Oct. 1.

Oct. 1. Warleggan.—*Proposed new cloak room, &c.*, at the Warleggan Council School, according to plans and specifications which may be seen at the School or at the office of B. C, Andrew, architect to the committee, Biddick's Court, St. Austell. Forms upon which all tenders must be made may be obtained at the School or from the architect. Sealed endorsed tenders must be sent to F. R. Pascoe, secretary, Education Office, Truro, on or before Oct. 1.

Oct. 1. Treverbyn.—*Proposed extension of girls' cloak room, &c.*, to the Treverbyn Council school according to plans and specifications which may be seen at the school or at the office of B. C. Andrew, architect to the committee, Biddick's Court, St. Austell. Forms upon which all tenders must be made may be obtained at the school or from the architect. Sealed endorsed tenders must be sent to F. R. Pascoe, secretary, education Office, Truro, on or before Oct. 1.

Oct. 1. St. Blazey.—*Proposed new cloakroom, w.c.*, &c., at the St. Blazey Boys' Council School according to plans and specifications which may be seen at the school or at the office of B. C. Andrew, architect to the Committee, Biddick's Court, St. Austell. Forms, upon which all tenders must be made, may be obtained at the school or from the architect. Sealed endorsed tenders must be sent to F. R. Pascoe, secretary, Education Office, Truro, on or before Oct. 1.

Oct. 2. Christiania, (Norway).—*Supply and erection of a signal and point lever box at Hundalen station* on the Ofoten railway (one of the Norwegian State Railways). Tenders through agent residing in Norway to be delivered not later than Oct. 2. Apply, 10 kr. deposit, "Driftsbestyrerens Kontor, Narvik."

Oct. 2. Blackrock.—*Execution of the following works* in connection with the new Assembly Room, Town Hall, Blackrock, for the U.D.C. (*a*) Overhauling and repairing roof. (*b*) Extension and repair of present ceiling and plaster work. (*c*) Construction of platform. Tenders for each of the several works to be on separate forms. Plans and specifications can be seen, and full particulars obtained, at the Town Hall, Blackrock. Materials must be, as far as possible, of Irish manufacture. Fair wages clause. Tenders (which are to be on prescribed forms) must be lodged with R. Finlay Heron, town clerk, Town Hall, Blackrock, County Dublin, on or before 4 o'clock p.m., Oct. 2. Contractors, when tendering, to give the names of two sureties, who are willing, if required, to join in a bond of £100 for the proper execution of the work.

Oct. 3. Devizes.—*Erection of shedding*, and the whole of the other necessary works in connection with the show yard for the meeting of the Wiltshire Agricultural Association, to be held at Devizes in 1907. Specifications of the work required and forms of tender may be obtained of the Secretary of the Association, Market Lavington, Devizes, on payment of one guinea, which amount will be refunded upon receipt of a bona fide tender. Tenders to be delivered by 10 a.m. on Oct. 3, sealed and endorsed "Tender for Shedding," to the Secretary.

Oct. 3. Weymouth.—*Constructing and maintaining retaining wall about 510 feet in length, of ferro-concrete work (Hennebique's system) on the north side of the Pile Pier within the borough, filling in and levelling up between the existing pier and the intended wall, new fences, Portland stone coping, and other works* appertaining thereto. Plans, specification, and condition of contract may be seen and form of tender obtained on application at the office of W. Barlow Morgan, borough engineer, Municipal offices, Weymouth. The contractor whose tender is accepted will be required to enter into a bond with a Guarantee Assurance Company to be approved by the Council for the due performance of the contract. Tenders, enclosed in the Official envelope, sealed and endorsed "Retaining Wall Pile Pier," to be delivered to H. A. Huxtable, town clerk, Municipal Offices, Weymouth, on Oct. 3 next, by 10,30 a.m.

Oct. 4. Burry Port.—*Erection of a lecture hall*, adjoining the English Congregational church. Plans and specification may be seen at the offices of T. Davies, secretary, Cloth Mart, Burry Port. Tenders, to be endorsed "Tender for Lecture Hall," to be forwarded by post to the secretary not later than Oct. 4.

Oct. 4. Swansea.—*Erection of four dwelling houses at Port Tennant, Swansea*, for the Swansea Harbour Trust. Drawings and specifications can be inspected at the office of the Trustees' engineer, A. O. Schenk, M.I.C.E., and forms of tenders obtained of T. Strick, clerk at the Harbour Offices, Swansea. Tenders marked outside "Tender for Dwelling-Houses" should be delivered to theClerk not later than 10 a.m.Oct.4.

Oct. 4. Salford.—*Additions and alterations to the Town Hall Building*, Duke Street, Broughton. Forms of tender and copies of bills of quantities may be obtained and plans, &c., seen at the Borough Engineer's Office, Town Hall, Salford. Tenders, endorsed "Broughton Town Hall Extension," and addressed to the Chairman of the Town Halls and Markets Committee, Town Hall, Salford, must be delivered to L. C. Evans, town clerk, Town Hall, Salford, not later than 9 a.m. on Oct. 3.

Oct. 4. Levenshulme.—*Erection of new Technical School*, at the rear of the Chapel Street Council School, Chapel Street, Levenshulme. Specifications, bills of quantities, and further particulars may be obtained on application to the architect, Mr. Henry Littler, 16, Ribblesdale Place, Preston, on payment of £3 3s., which will be returned on receipt of a *bonâ fide* tender. Tenders, endorsed "Tender for new Technical School," to be sent on or before Oct. 4, to J. Ogden Hardicker, clerk, Northern Assurance Buildings, Albert Square, Manchester.

Oct. 4. Swadlincote.—*Erection of lock-up shop and public conveniences*, and for the pulling down and removal of existing public conveniences and shops in Midland Road, Swadlincote, for the U.D.C. Drawing and specifications may be seen, and quantities and forms of tender obtained of A. J. Mason, A.M.I.C.E., town engineer and surveyor, Swadlincote, on depositing £1 1s. Tenders, enclosed in the envelopes provided, are to be delivered at the clerk's office, Belmont Street, Swadlincote, not later than 10 a.m. on Oct. 4.

Oct. 5. London, N.E.—*Erection of a two-storey school, manual training centre, cookery centre, caretaker's cottage, &c.*, on the Aldersbrook School site, Ingatestone-road, in the Urban District of Wanstead, Essex. Drawings and specifications may be inspected, and copies of the bills of quantities obtained at the offices of C. H. Bressy, architect, 70 and 71, Bishopsgate Street Within, E.C., upon payment of a deposit of £2. The contractor whose tender is accepted will be required to obtain the bond of an approved guarantee society in an amount equal to 25 per cent. of the amount of tender as security for the due performance of the contract. Sealed tenders, endorsed "Aldersbrook School Tender," and addressed to the Chairman, W.L.A.S.C. Council Offices, Wanstead, N.E., must be delivered before 6 p.m. on Oct. 5.

Oct. 6. East Meon.—*Two cottage dwelling houses to be erected at East Meon* for the Trustees of the Forbes Almshouses, East Meon, Petersfield. Plans and specifications may be seen at the Church Institute between the hours of 9 a.m. and 4 p.m. during the fortnight commencing Sept. 21, on application to H. Coles, churchwarden. All tenders must be sent to Bucknall & Comper, architects, 123, Knights Hill Road, West Norwood, London, S.E., by Oct. 6.

Oct. 6. St. Dennis, Cornwall.—*Erection and completion of a New Bible Christian Chapel* at Enniscaven, St. Dennis, Cornwall. Plans and Specifications may be seen on application to J. Docking, Enniscaven. For further particulars apply at the office of F. C. Jury, architect, No. 1, Alma Villas, Tregonissey Road, St. Austell. Tenders, sealed and endorsed "New Chapel Tenders," must be sent to the Rev. T. Spillett, The Manse, St. Columb, on or before Oct. 6.

Oct. 6. Deal.—*Erection of a new school*, to accommodate 240 infants, together with boundary walls and other site works, at Deal. The drawings and specification may be inspected at the office of Chas. L. Crowther, architect, Queen Street, Deal, from whom also a copy of the bills of quantities may be obtained upon payment of a deposit of £1 1s. Tenders on the form and in the envelope supplied, to be delivered to F. C. Brown, clerk to the Committee, High Street, Deal, not later than Oct. 6.

Oct. 8. Carrick-on-Shannon.—*New Crown Post Office* at Carrick-on-Shannon County Leitrim. Tenders will be received up to but not later than 10 a.m. on Oct. 8, by H. Williams, Secretary, Office of Public Works, Dublin. The plans and specification can be seen at the Post Office, Carrick-on-Shannon. Forms of tender and bills of quantities will be supplied on deposit of £1, The separate envelopes containing the tender and the bill of quantities must be endorsed. The accuracy of the quantities is not guaranteed,

Oct. 9. Dublin.—*Erection and completion of a gymnasium* at the Royal Hibernian Military School, Phœnix Park. Tenders will be received up to but not later than 10 a.m. on Oct. 9. The plans and specification can be seen of H. Williams, secretary, Office of Public Works, Dublin. Forms of tender and bills of quantities will be supplied on deposit of £1. The separate envelopes containing the tender and the bill of quantities must be endorsed.

Oct. 11. London, S.E.—*Carrying out of extensions and alterations of the Council's baths and washhouses*, Kennington Road. Plans can be seen and specifications and bill of quantities obtained on deposit of a sum of £1 1s., at the offices of the borough engineer, H. C. J. Edwards, C.E., 345, Kennington Road, S.E., between the hours of 10 a.m. and 12 noon and 2 p.m. and 4 p.m. (Saturdays excepted). Sealed tenders, endorsed "Tenders for Building Work, Kennington Baths," to be delivered to H. J. Smith, town clerk, Town Hall, Kennington Green, S.E., not later than 12 o'clock noon on Oct. 11.

Oct. 12. Newport.—*Erection of new infirmary buildings* adjoining the workhouse for the Guardians of the Newport(Salop)Union. Plans and specifications can be seen, and bills of quantities and forms of tender obtained, on application to Fleeming & Son, architects, Bank Chambers, Wellington, Salop. The sum of £1 1s. will be charged for copy of bills of quantities. Tenders must be delivered to R. P. Liddle, clerk to the Guardians, Newport, not later than 9 o'clock a.m. on Oct. 12.

Oct. 13. London, W.—*Pulling down of the existing brick-arched carriageway bridge* over the canal. and the construction and erection of a new brick, concrete, and steel carriageway bridge (30ft. span), a new tollkeeper's office, and the execution of certain works appurtenant thereto, all in and about Warwick Avenue. Contract No. 1.—Building constructional works, &c. Contract No. 2.—Steelwork, &c. Contract No. 3.—Nos. 1 and 2 together. Forms of tender, general conditions, specifications, and bills of quantities will be furnished upon application to E. B. B. Newton, Assoc.M.Inst.C.E., F.S.I., borough surveyor, Paddington, W., after payment to the Borough Accountant of £1 for a set containing one copy for each document. Further particulars may be obtained, and the drawings seen, on application at the Borough Surveyor's Office between the hours of 10 a.m. and 4 p.m. (Saturdays, 10 a.m. and 1 p.m.), or on written inquiry to the Borough Surveyor and the receipt by him of stamped addressed envelope for reply. Tenders must be sent in sealed and endorsed "Reconstruction of Warwick Avenue Bridge," "No. 1, Building Constructional Works," "No. 2, Steelwork," or "No. 3, Nos. 1 and 2 together," directed to the Town Clerk, and delivered at his office, Town Hall, Paddington, W., not later than Oct. 13, after which no tender will be received.

Oct. 12. West Lynn.—*Erection of a new school at West Lynn.* Builders desirous of tendering should send in their names not later than Sept. 21, to W. O. Milne, architect, 77, Chancery Lane, London, W.C., from whom bills of quantities can be obtained on and after Monday, Oct. 1st. Plans and specifications can be inspected at the existing school by arrangement with the Schoolmaster. A deposit of £1 1s. will be required, which will be returned on receipt of a *bona fide* tender. Tenders must be delivered by 12 noon, on Oct. 12, addressed to "The Secretary, Norfolk Education Committee, 57, London Street, Norwich," and endorsed "Tender for West Lynn School."

Oct. 15. Coventry.—*Erection of buildings* at Foleshill Works, for the Corporation of Coventry, comprising: Retort House, 220ft. × 130ft., by average height of 45ft.; Coal Stores, 100ft. × 70ft × 32ft. high; Coal-breaker Pit, 42ft × 17ft. × 25ft. deep; Two Chimneys, each 82ft. high; 350 yards of Sunk Dock for single line of railway, Stokers' Mess Rooms, Lavatories, &c. The drawings may be seen and specifications, with form of tender and bill of quantities obtained on and after Oct. 1, and on payment of £1 1s. Sealed tenders, addressed to the Chairman of the Gas Committee, Gasworks, Coventry, endorsed "Tender for Retort House and Coal Stores," &c., must be delivered not later than 9 a.m., Oct. 15.

Oct. 20. Stafford.—*New High School for Girls, Stafford.* Builders desiring to tender for the work should apply to G. Balfour, director of education, County Education Offices, Stafford, on or before Oct. 20. Quantities will be supplied, for which a deposit of £2 2s. will be charged.

No Date. Sherborne.—*Building a new boarding-house,* upon the Bradford Road, Sherborne, for the Directors of the Sherborne Ladies' College. Plans and specifications can be seen and quantities obtained upon application to John Harding & Son, architects, 58, High Street, Salisbury. Tenders are to be sent to E. W. Bartlett, secretary, The Abbey Close, Sherborne.

ENGINEERING.

Sept. 27. Bamford.—*Providing and laying of about 1,300yds. of 3-in. cast-iron pipes,* together with the construction of a brick collecting chamber, and other works connected therewith, at Bamford, Derbyshire, for the Chapel-en-le-Frith R.D.C. Drawings may be seen and bills of quantities, specification, and form of tender obtained on application to Swann & Brady, Council's engineers, Town Hall, Chapel-en-le-Frith, Stockport, on payment of £1. Tenders to be delivered on or before noon, Sept. 27, endorsed "Tenders Bamford Water," and addressed to J. B. Boycott, clerk to the Council, Chapel-en-le-Frith. The successful contractor must (if required) provide security for the due fulfilment of the contract.

Sept. 28. Dudley.—*New Lancashire boiler,* to be supplied and fitted at the Dudley Union Workhouse in accordance with specification to be obtained from G. W. Coster, clerk to the Guardians, Union Offices, Dudley, upon deposit of £1 1s. The proposed site can be seen upon application to the Master of the Workhouse. Tenders to be sent so as to reach Mr. Coster by 10 o'clock a.m. on Sept. 28.

Sept. 28. South Shields.—*Warming and ventilation, on the Plenum system,* of a block of four school departments, accommodating a total of 1,950 scholars, to be erected on the site of the Mowbray Council School, South Shields, subject to the approval of the plans for the same by the Board of Education and the Local Government Board. The plans may be inspected and further particulars will be supplied at the offices of Henry Grieves, A.R.I.B.A., architect, Albany Chambers, King Street, South Shields, to whom draft schemes and estimates must be delivered not later than Sept. 28.

Sept. 28. Pewsey.—*Sinking of a well, 10 ft. internal diameter and 90 ft. deep, and for sinking from the bottom of such well a bore hole 12 ins. internal diameter and a further 11 ft. deep,* together with other work in connection therewith at Pewsey for the R.D.C. The drawing and specification for the above may be seen of S. B. Dixon, clerk to the Pewsey R.D.C., Pewsey, from 10 a.m. to 5 p.m. each day except Saturdays. Copies of specification and form of tender and schedule may be obtained from Fairbank and Son, C.E., engineers, Lendal Chambers, York, on payment of £3 3s. Sealed tenders, endorsed "Tender for Well and Bore Hole, Contract A," must reach S. B. Dixon on or before 10 a.m. on Sept. 28 next.

Sept. 28. Hemel Hempstead.—*Rebuilding of a county bridge and works of widening the main road, embracing alterations to buildings at Two Waters, Hemel Hempstead.* Persons desirous of contracting for the work may see the specifications, agreement, &c., at the County Surveyor's Offices, Hatfield, between the hours of 10 a.m. and 4 p.m., except on Saturday, when they will be on view from 10 a.m. to 12 mid-day. A copy of the specification and schedule of works and prices and a form of tender can be obtained at the county surveyor's Office upon payment of £2. 2s Sealed tenders endorsed "Tenders for New Bridge and Works at Two Waters" must be delivered to U. A. Smith, county surveyor, County Surveyor's Office, Hatfield, not later than Sept. 28. Such security for the due execution of the works as the Council may require must be given by the contractor.

Sept. 29. Blackpool.—*Supply and fixing* of one 800 to 1,000-kw. turbine direct-coupled to one 800-kw. single-phase alternator, and one 500-kw. direct-current tramway generator; also for surface-condensing plant in connection with above, for the Electricity and Tramways Committee of the Blackpool Corporation. Specification and conditions, with form of tender, may be inspected at the Engineer's Office, and may be obtained on payment of £3 3s. Sealed tenders, endorsed "Tender for Turbo-Generators," must be addressed to the Chairman, Electricity and Tramways Committee, West Caroline Street, Blackpool, and be delivered not later than Sept. 29.

Sept. 29. Southport.—Contract No. 1.—Electric motors and pumps. Contract No. 2.—Gas engines and pumps. Contract No. 3.—Revolving sprinklers for filter beds. Contract No. 4.—Screening arrangements for the Corporation of Southport required for their new sewage works at Crossens. The plans may be inspected and particulars obtained on deposit of cheque for £2 at the office of R. P. Hirst, Assoc.M.Inst.C.E., borough engineer, Town Hall, Southport. Tenders, sealed and endorsed "Contracts Nos. 1, 2, 3, or 4," to be delivered to J. Jarratt, town clerk, Town Hall, Southport, on or before 12 noon Sept. 29.

Sept. 30. Zurich.—*Supply and erection of turbines and electric machinery* to the Municipal generating station at Zurich. Tenders will be opened on Sept. 30 at the "Stadtischer Bauvorstand II."

Oct. 1. Dublin.—*Tenders for electrical plant* in good condition, at present in use but no longer required, at the Science and Art Museum and adjoining buildings in Kildare Street, Dublin, will be received up to 12 o'clock noon on Oct 1. Tenders should be addressed to the Secretary, Office of Public Works, Dublin. The plant comprises three Willans patent central-valve compound engines, mounted on same bed-plate as and directly coupled to three Johnson and Phillips Kapp-type half-compounded dynamos, 112 volts by 450 amperes, 450 revolutions, with steam pipes, connections to switchboard, &c.; three positive and one negative slate switchboards, with switches, instruments, &c., and one for connection of dynamos in parallel; five Elihu Thomson meters; one Parker booster for 58 cells; one 58-cell battery and switchboard, with charging and discharging switches, resistance, &c., complete. Contractors to remove the plant and make good after removal at their own cost to the satisfaction of the Board.

Oct. 2. Bangor (Co. Down).—*Construction of a reservoir* and auxiliary works at Ballysallagh Major, near Bangor; also laying a line of 12-in. pipes from the intended reservoir to Bangor urban district boundary. Plans and specification of the intended works may be seen at the office of Messrs. L. L. Macassey & Sons, 7, Chichester Street, Belfast. Quantities for the intended works may be obtained from Mr. S. C. Hunter, Scottish Provident Buildings, Belfast, from whom also a copy of the specification may be had on a deposit of £5 5s., which will be repaid on the return of the same. Tenders, accompanied by priced bills of quantities and specification, to be lodged with James Milliken, town clerk, Bangor, Co. Down, not later than noon on Tuesday. Oct. 2.

Oct. 2. Chipping Campden.—*Provision, laying, and jointing of about 6,800yds. of 5-in. cast-iron pipes, 3,200yds. of 4-in. cast-iron pipes, 2,500yds. of 3-in. cast-iron pipes, and 540yds of 2-in. cast-iron pipes.* Together with all special castings, valves, and hydrants required; also for the construction of service reservoir and other works in accordance with the drawings and specifications prepared by the engineers for the R.D.C. Drawings and specification may be seen and bills of quantity and form of tender obtained at the offices of Willcox & Raikes, engineers, 63, Temple Row, Birmingham, on payment of a deposit of £3 3s. Sealed tenders, in envelopes supplied, endorsed "Moreton-in-the-Marsh Water Supply—Contract No. 1," to be delivered to O. H. New, clerk to the Council, Chipping Campden, not later than 12 o'clock noon on Oct. 2.

Oct. 10. Brussels.—*Construction of a section of the railway from Hannut to Huccorgne on the local railways from Hannut to Vinalmont and Burdinne to Huy.* The estimated cost of the work is 287,500fr. (£11,500), and a deposit of 29,000fr. (£1,160) is required to qualify any tender. Tenders by registered letter will be received at the "Société nationale des chemins de fer vicinaux" offices, 14 Rue de la Science, Brussels, not later than Oct. 9. A copy of the specifications may be obtained on payment of 1fr. from M. Mahieu, Rue du Moulin, No. 3, Waremme.

Oct. 13. London, S.W.—*Supply, delivery, and fixing complete* at the depot, Queen's Road, Wimbledon, of a circular saw bench, band sawing machine, and a 12-h.p. electrical motor for driving same. Particulars may be obtained on application to the Borough Engineer and Surveyor, Town Hall, Wimbledon. Sealed tenders, endorsed "Wood-cutting Machinery," to be delivery at the Town Hall on or before noon on Oct. 13.

Oct. 15. Coventry.—*Manufacture, supply and erection* for the Gas Committee, at their Foleshill Works, of the hydraulic plant:—Two wagon tipping machines, one direct acting hydraulic lift, two 1-ton capstans and snatch heads, one set of high-pressure steam pumps, one accummulator, &c., connecting pipes, valves, &c. Drawings, specification, and form of tender may be obtained on payment of £1 1s. Sealed tenders, addressed to the Chairman of the Gas Comittee, Gasworks, Coventry, endorsed "Tender for Hydraulic Plant," must be delivered not later than 9 a.m., Oct. 15.

Oct. 15. Coventry.—*Manufacture, supply, and erection, at the Foleshill Works* of the Gas Committee, of the following coal-conveying plant: Two gravity bucket conveyors, each about 830ft. long and capacity of 40 tons per hour; two short tray conveyors, each about 36ft. long and similar capacity; one large 4-roll coal breaker of capacity of 60 tons large coal per hour: high-pressure steam engines, for driving the breaker and conveyors; one 15-ton capacity receiving hopper, together with steel work, &c., for carrying breaker, &c. Drawings, specification and form of tender may be obtained of F. W. Stevenson, general manager, Gas Works, Coventry, on payment of £1 1s. Sealed tenders addreised to the Chairman, Gas Works, Coventry, endorsed "Tender for Coal Conveyors," &c., must be delivered not later than 9 a.m on Oct. 1.

Oct. 31. Zagazig.—*Installation of a supply of drinking water in the town of Zagazig,* in accordance with plans and specifications to be seen at the Ministry of the Interior. Tenders made out on stamped paper, obtainable from Lieut.-Col. Western, R.E., C.M.G., Queen Anne's Chambers, Westminster, S.W., and marked "Offre pour les travaux d'installation d'eau à Zagazig," should be addressed to "S. E. le Sous-Sécrétaire d'Etat, Ministère de l'Intérieure, Cairo," where they will be received up to Oct. 31. A deposit of 10 per cent. of the estimate is required to qualify any tender. Conditions of tender, together with lists of the materials and machinery required may be seen at the Commercial Intelligence Branch of the Board of Trade, 73, Basinghall Street, E.C.

Nov. 3. Shanghai.—*Construction and erection of two steel girder bridges across the Soochow Creek to replace the present Garden Bridge and Chekiang Road Bridge.* The Garden Bridge will consist of two spans, each of 171 feet and having a width of 60 feet between the parapets. The Chekiang Road Bridge will be one span of 196ft. with a width of 40ft. between parapets. General conditions, specifications, drawings, forms of tender, and all other information may be obtained at the office of Charles Mayne, M.Inst.C.E., municipal engineer, No. 15, Hankow Road. A charge of Tls. 100 will be made for the specification and set of drawings. Sealed tenders, separately for each bridge, and endorsed "Garden Bridge," or "Chekiang Road Bridge," will be received by W. E. Leveson, secretary, Council Room, Shanghai, not later than noon on Nov. 3.

Nov. 6. Madrid.—*Construction and working of a railway between Ferrol and Betanzos,* in accordance with conditions set forth in the "Gaceta de Madrid" of August 7. A Government subsidy of 3,054,508 pesetas (about £109,284), payable in eight annual instalments, will be granted to the concessionnaire. All materials imported for the construction of the line and for its working during the first 10 years will be exempted from import duties. A deposit of 145,259 pesetes (about £5,196) is required to qualify any tender. Tenders will be opened on Nov. 6 at the Directorate General of Public Works, Madrid.

IRON AND STEEL.

Oct. 8. Kingswinford.—*Supply and delivery on the works, as may be required, of about 715 tons of cast-iron pipes,* varying in size from 16ins. to 27ins. in diameter, for the Kingswinford R.D.C. Plans, detailed drawings, and form of contract may be seen, and specifications, schedules, and bills of quantities obtained at the offices of W. Fiddian, F.S.I., engineer, Old Bank Offices, Stourbridge, on payment of £2 2s. Two sureties will be required for the due performance of the contract. Sealed tenders, endorsed "Tender for Kingswinford Sewerage Contract No. 9," to be sent to G. F. James, clerk to the Council, the Council Offices, Wordsley, Stourbridge, not later than noon Oct. 8.

PAINTING & PLUMBING.

Sept. 27. London, S.W.—*Certain Painting Works at the Infirmary* for the Guardians of the Wandsworth Union. Form of specification and tender can be obtained upon application to F. W. Piper, Clerk Union Offices, St. John's Hill, S.W., and the same must be returned not later than 10 a m. on Sept. 27. Separate tenders must be sent in, endorsed "Tender for Painting Works, Infirmary."

Sept. 27. Northampton.—*Painting and decorating, &c.,* required at the Police Court, Guildhall, Northampton. Conditions of contract can be seen, and specifications and forms of tender obtained on application to A. Fidler, M.Inst.C.E., borough engineer, Guildhall. Sealed tenders, endorsed "Tender for Police Court Painting," are to be delivered to H. Hankinson, town clerk, Guildhall, on or before 12 o'clock noon, on Sept. 27.

Sept. 27. Llantrisant.—*Cleaning, scraping and painting various road, bridle and foot bridges* for the Llantrisant and Llantwit Fardre R.D.C., within the Council's area. Specification may be seen at the office of G. S. Morgan, surveyor, School Street, Pontyclun, from whom schedules of the bridges may be obtained upon payment of £1. Tenders must be delivered to the Clerk of the Council, W. Spickett, solicitor, Pontypridd, before 10 a.m. on Sept. 27.

Sept. 29. Dundee.—*Repainting the Town House buildings.* The specifications may be seen and schedules of quantities and forms of offer obtained at the office of J. Thomson, city architect, 91, Commercial Street, Dundee. Tenders, endorsed "Painting Town House," are to be lodged with W. H. Blyth Martin, town clerk, City Chambers, Dundee, not later than Sept. 29.

Oct. 1. London W.—*Outside painting and repairing works* at the Houseless Poor Wards, 86, East Street Marylebone Road, W., for the Guardians of the Poor. Persons desiring to tender may obtain a specification and form of tender upon application to the Guardians' architect, Mr. A. Saxon Snell, F.R.I.B.A., of 22, Southampton Buildings, Chancery Lane, W.C., and depositing with him a £5 Bank of England note. Tenders to be signed, sealed, and endorsed "Tender for Outside Painting Works, &c., Houseless Poor Wards," and addressed and delivered to H. T. Dudman, Guardians' Office, Northumberland Street, Marylebone Road, W., at or before 10 a.m. on Oct. 1.

Oct. 1. Margate.—*Painting of the external wood and ironwork, and the colouring of the rough-cast work* at the Wingham Pumping Station. Specification can be seen and particulars obtained at the Borough Surveyor's Offices, Municipal Buildings, Margate. Tenders, under cover, endorsed "Painting," to be sent to Edward Brooke, town clerk, Town Clerk's Office, 18. Cecil Square, Margate, not later than 1 o'clock on October 1.

Oct. 1. Stratford-on-Avon.—*Painting and Repairs at Corporation Properties.* Specification of the work may be seen, and form of tender obtained, upon application at the Borough Surveyor's office. Tenders, sealed and endorsed "Painting, etc.," to be sent to R. Dixon, borough surveyor, Municipal Offices, Stratford-upon-Avon, by October 1.

Oct. 3. London, N.—*External and internal cleaning and painting works,* at the Northern Convalescent Fever Hospital, Winchmore Hill, N., in accordance with specification prepared by W. T. Hatch, M.Inst.C.E., M.I.Mech.E., engineer-in-chief. Specification, conditions of contract, bill of quantities, and form of tender may be inspected at the office of the Board, Embankment, E.C., and bills of quantities and forms of tender can then be obtained upon payment of a deposit of £1. Tenders, addressed as noted on the form, must be delivered at the office of the Board not later than 10 a.m. on Oct. 3.

Oct. 1. Hull.—*Painting, &c., at the Relief Station, St. George's Road, Hull*, for the Sculcoates Union. Forms of tender and all particulars can be obtained or will be sent by post, on application to J. H. Wild, solicitor, clerk to the Guardians, Union Offices, Harley Street, Hull. Fair wages clause. Tenders must be sent to Mr. Wild so as to be received not later than 10 o'clock on Oct 1.

Oct. 5. Llanelly.—*Painting and papering required at the Union Workhouse* in accordance with specification, which may be inspected at the office of W. Griffiths, architect, Llanelly. Tenders to be sent in to D. C. Edwards, clerk, Union Offices, Llanelly, on or before Oct. 2.

Oct. 6. Chelmsford.—*Painting and other work* to the new Head Quarters, Springfields, Chelmsford, for the Standing Joint Committee of the Court of Quarter Sessions, &c. Specification can be seen at the office of F. Whitmore, county architect, 73, Duke Street, Chelmsford, any working day, except Saturday, between the hours of ten and four. Sealed Tenders, endorsed "Tender for Painting, etc., New Head Quarters, Springfield," must be addressed and delivered to F. Whitmore, not later than Oct. 6.

Oct. 8. Dublin.—*Painting of the following girder bridges*, for the directors of the Great Northern Railway Co. (Ireland):—1. The Carrickmacross Road Bridge at Dundalk Station. 2. Ardee Road Bridge over Barrack Street branch at Rail Yard, Dundalk. 3. Hill Street Bridge, Dundalk. 4. Underline Bridge on Howth tramway (G.N.R. [I.]), at Howth Station. Parties wishing to tender can see the specification at the office of W. H. Mills, engineer-in chief, Amiens Street Terminus, Dublin, or copy thereof at office of the district engineer, Belfast; and forms of tender can be obtained at either of the above-mentioned places on payment of 1s. each. Tenders, made out separately for each of the four contracts and on the forms supplied by the company, endorsed "Tender for Painting," should be lodged with T. Morrison, secretary, Secretary's Office, Amiens Street Terminus, Dublin, not later than 10 a.m. on Oct. 8.

ROADS AND CARTAGE.

Sept. 27. Royal Leamington Spa.—*Making a short length of roadway*, for the Town Council. Plans and specification may be seen at the office of their engineer, at the Town Hall. Tenders addressed to L. Rawlinson, town clerk, Town Hall, Royal Leamington Spa, and endorsed, "Tender for Road Making," are to be sent in before noon on Sept. 27.

Sept. 29. Walmer.—*Supply of 400 tons, more or less, of quartzite*, broken to pass a 1½-in. ring; also 50 tons fine, free from dust, delivered carriage paid, in trucks, at Walmer or Deal Station, in quantities as required, during the months from November to March inclusive for the U.D.C. Tenders, endorsed "Road Material," to be addressed to the Clerk to the Council, must be delivered at the Council Offices not later than Sept. 29. A sample of the material offered is to accompany each tender.

Sept. 29. Leeds.—*Making asphalt footpaths, covering the existing pitched foundation of the carriageway* with broken granite, and laying channels in Allerton-Drive, Chapeltown, for the Highways Committee. Forms of tender and bills of quantities may be obtained, and copies of the documents forming the contract inspected, on application at the Highways Office, 155, Kirkstall Road. Sealed tenders, endorsed "Tender for Private Street Works," and addressed to the Highways Committee, must be delivered at the Town Clerk's Office, Town Hall, Leeds, not later than 10 a.m. on Sept. 29.

Sept. 29. London, W.—*Supply of fine crushed Thames shingle, granite chippings*, or other material suitable for strewing upon carriageways during frosty weather, to be delivered at such times and in such quantities as may be required by the Council before the end of March, 1907. Printed forms of tender and further particulars may be obtained upon application to E. B. B. Newton, Assoc.M.Inst.C.E., F.S.I., borough surveyor, Town Hall, Paddington, W., between the hours of 10 a.m. and 4 p.m. (Saturdays, 10 a.m. and 1 p.m.) No tender will be considered unless upon the official form. Tenders must be sent in sealed and endorsed "Shingle," directed to A. W. J. Russell, town clerk, Town Hall, Paddington, W., and delivered not later than Sept. 29, after which no tender will be received. Samples of the material proposed to be supplied must be sent with the tender.

Oct. 1. Reigate.—*Supply of about 100 tons of rough Rhenish basalt or Cherbourg quartzite*, delivered carriage paid at the Workhouse, near Earlswood Station (L. B. & S. C. Ry.). Persons tendering must state how soon the material can be delivered, and send samples of same to the Master at the Workhouse, Redhill, Surrey. Tenders to be delivered to F. C. Morrison, 46, High Street, Reigate, Surrey, in sealed envelopes, endorsed outside "Tender for Stone," on or before Oct. 1.

Oct. 1. Frimley.—*Ballasting and metalling of 7¾ miles of roads*, for the U.D.C., in their district. Plans, sections and specifications may be seen, and copies of quantities and form of tender obtained from T. C. Jones, C.E., engineer and surveyor, Municipal Offices, Camberley, on payment of £2 2s. Sealed tenders, giving the names and addresses of two sureties, are to be delivered to F. T. S. Marsh, clerk to the Council, Municipal Offices, Camberley, endorsed "Tender for Reconstruction of Roads," not later than noon on Oct. 1.

Oct. 1. Teddington.—*Following works in connection with the making up of Munster Road*, in the Parish of Teddington, for the U.D.C.:—3,862 sup. yds. of roadway forming and metalling, 1,015 lin. yds. of kerbing, 1,015 lin. yds. of channelling, 2,312 sup. yds. of tarpaving. Plans and specifications may be seen, bills of quantities and forms of tender obtained on payment of £2 2s., on application to M. Hainsworth, surveyor, Elmfield House, Teddington. Tenders will not be considered unless made out on the forms provided. Sealed tenders, endorsed "Private Street Works," must reach G. H. Salmons, clerk, Elmfield House, Teddington, not later than noon on Oct. 1.

Oct. 1. Sandgate.—*Supply of the following highway materials* to be delivered at the cost of the contractor on or before Nov. 30:—60 tons of Guernsey granite, broken to pass a 1-in. gauge, to be delivered into carts at Folkestone Harbour or on rail at Sandgate station, free of all charge for freight, carriage, harbour, or other dues whatsoever; 10 tons of Guernsey granite siftings, broken to pass a ¾-in. gauge, ditto, ditto; 150 tons of Cherbourg quartzite, broken to pass a 2-in. gauge, ditto, ditto; 25 tons of Cherbourg quartzite siftings, broken to pass a ¾-in. gauge, ditto, ditto; 150 cubic yds. (more or less) of dug flints, broken to pass a 2½-in. gauge, and delivered upon roads or into depot as directed; 75 cubic yds. (more or less) of Kentish ragstone, broken to pass a 2½-in. gauge, ditto, ditto. All the stone is to be hand broken, thoroughly screened, free from dust and dirt, and to the entire satisfaction of the Council's surveyor. Tenders may be sent in for all or either of the above items, and samples of each of the items included in any tender must be sent to the Surveyor's office at Sandgate before the date of delivery of the tender. Forms of tender may be obtained upon application to J. S. Atkinson, clerk to the Council, Council Offices, 51, High Street, Sandgate. Tenders must be on the forms supplied, and under cover, marked "Tender for Highway Material," and must reach him not later than Oct. 1. In case any tender shall be accepted, the person or persons who shall have made such tender shall within one week after the acceptance of the tender by the Council execute such contract for the delivery of the material as the Council shall determine.

Oct. 2. Handsworth.—*Street improvement works in Wellington Road* for the U.D.C. All particulars may be obtained on application to H. Richardson, Assoc.M.Inst.C.E., surveyor to the Council. Sealed tenders, endorsed "Wellington Road Improvement," are to be delivered at the office of the Surveyor, Council House, Handsworth, Birmingham, on or before Oct. 2. Fair wages clause.

Oct. 2. London, W.—*Making up of the following roads*:—Wolverton Gardens (portion), King's Road (portion), St. Kilda Road (portion), Lyncroft Gardens, for the Town Council of the Borough of Ealing. The drawings and specification may be seen, and form of tender, together with schedule of quantities and other particulars, obtained from C. Jones, M.Inst. C.E., borough engineer, Town Hall, Ealing, W., any day during office hours, upon payment of a deposit of 10s. 6d. for each road. Sealed tenders, in the envelopes provided, endorsed "Tender for Making-up——," must be delivered to G. E. Brydges, town clerk, Town Clerk's Office, Town Hall, Ealing, W., not later than 9.30 a.m. on Oct. 2.

Oct. 2. Leatherhead.—*Supply of about 1,000 tons of well-broken 1½-in. gauge and 120 tons of ½-in. chippings of Basalt, Quenast, or Enderby granite*, in truck loads at Leatherhead station for the U.D.C. Samples of stone to accompany tender. Tenders are also invited for steam rolling and scarifying. The contractor to supply 10 or 12-ton steam-roller, with driver, flagman, notice boards, stores, water-cart, and fuel. Contractors are to state the rate per day for rolling and the price per square yard for scarifying. Tenders to be submitted, under cover, addressed the Clerk, U.D.C., Council Offices, Leatherhead, on or before Oct. 2nd, at 5 p.m., endorsed "Tender for——."

Oct. 2. Lewisham. S.E.—*Kerbing, channelling, and metalling the roadway and paving the footpaths with artificial stone (in separate contracts) of Saravia Road, Lewisham.* The plans and specifications may be seen and forms of tender obtained at the Town Hall, Catford (Surveyor's Department). Copies of the specification may also be had on payment of the sum of 5s. in each case, which will not be returned. The tenders must be on forms issued by the Council, enclosed in an envelope, sealed and endorsed "Tender for Saravia Road," and must be delivered by 4 o'clock on Oct. 2, at the Town Hall, and placed in the box there provided for the purpose. The works must be proceeded with immediately on acceptance of tender and execution of contract, and the contractor must employ local labour as far as practicable in carrying out the work. Fair wages clause.

Oct. 3. London, S.W.—*New tar-paving and repairs to existing paving at Tooting-bec Asylum*, Tooting, S.W., in accordance with specification prepared by Mr. W. T. Hatch, M.Inst.C.E., M.I.Mech.E., engineer-in-chief. Specification, conditions of contract, and form of tender may be inspected at the office of the Board, Embankment, E.C., and can then be obtained upon payment of a deposit of £1. Tenders, addressed as noted on the form, must be delivered at the office of the Board not later than 10 a.m. on Oct 3.

Oct. 3. London, S.E.—*Supplying and laying cresoted deal blocks* in the roadway in High Road, Lee, from High Street, Lewisham, to Lee Green; also for repaving with the same material a portion of the roadway in Tranquil Vale, Blackheath, particulars of which are set out in the specifications and forms of tender for the Borough of Lewisham. The plans, specifications, and conditions may be seen and forms of tender obtained at the Town Hall, Catford (Surveyor's Department). The tenders must be on forms issued by the Council, enclosed in an envelope, sealed and endorsed "Tender for Wood Paving in——," and must be delivered by 12 o'clock on Oct. 3, at the Town Hall, and placed in the box there provided for the purpose. The contractor must employ local labour as far as practicable in carrying out the work.

Oct. 4. Bromley.—*Works of sewering, levelling, paving, metalling, channelling and making good Hayes Road.* The works will include (about)—Excavation, 3,250 cubic yds.; hardcore, 1,620 cubic yds.: flints (pit), 1,330 cubic yds.; kerb, Norway granite, 1,620 lineal yds.; channel, New Guernsey setts, 260 lineal yds.; channel, secondhand setts, 1,070 lineal yds.; Burgess Hill brick paving, 2,970 super. yds.; 2-in. Hayes gravel margins, 1,460 super. yds. Plans and sections may be seen, and specifications, bills of quanties, and forms of tender obtained, at the office of the Borough Engineer, Bromley, Kent (Municipal Offices, East Street), on payment of £1 1s. at the office of the Clerk of the Bromley Rural District Council, Park House, Beckenham Lane, Bromley, Kent. Tenders, endorsed "Tender for Hayes Road," must be delivered to the Clerk of the Bromley Rural District Council, at Park House aforesaid, not later than Oct. 4.

No date. Wealdstone.—*Construction of about 1,050ft. of road and sewers at Wealdstone.* Specifications, plans, and sections can be seen at the offices of Allen & Hoar, surveyors, 283, West End Lane, N.W.

SANITARY.

Sept. 27. Llantrisant.—*Providing and laying about 450 lineal yards of 6in. diam. stoneware pipe effluent drains*, together with the construction of suitable distributing outlet chambers and other minor works at the Llantrisant Sewer Outfalls upon New Parc Farm, Llantrisant. Drawings and specification may be seen at the office of G. S. Morgan, surveyor, School Street, Pontyclun, from whom bills of quantities and forms of tender may be obtained upon payment of £. Tenders must be delivered to the Clerk of the Council, W. Spickett, solicitor, Pontypridd, before 10 a.m. on Sept. 27.

Sept. 27. Bamford, Derbyshire.—*Providing and laying of about 1,300yds. of 3-in. cast-iron pipes, together with the construction of a brick-collecting chamber and other works connected therewith at Bamford, Derbyshire*, for the Chapel-en-le-Frith. Drawings may be sehn and bills of quantities, specificotion, and for of tender obtained, on application to the Council's engineers, Swann & Brady, Town Hall, Chapel-en-le-Frith, Stockport, on payment of £1. Tenders to be delivered on or before noon, Sept. 27, endorsed "Tenders Bamford Water," and addressed to J. H. Boycott, clerk to the Council, Chapel-en-le-Frith. The successful contractor must (if required) provide security for the due fulfilment of the contract.

Sept. 27. Llantwit.—(a) *Providing and laying about 519 lineal yards of 9-in. diam. and 324 lineal yards of 6-in. diam. stoneware pipe sewers*, to gether with the necessary manholes, flushing chambers, ventilators, and other appurtenant works, at Llantwit Church, Llantwit Fardre. (b) Widening the District Road between Efail Isaf Station and Efail Isaf for a distance of about 16 lineal yards, and constructing the necessary banks, drain, &c., for the Llantrisant and Llantwit Fardre R.D.C. Drawings may be seen at the office of and forms of tender and bills of quantities may be obtained from G. S. Morgan, surveyor, School Street, Pontyclun, on payment of £1 each. Tenders must be delivered to the Clerk of the Council, W. Spickett, solicitor, Pontypridd, before 10 a.m. on Sept. 27.

Sept. 28. Birmingham.—*Construction of private street works*, including road and sewer construction in Mona Road (off Kingston Road) and Green Street (off Garrison Street), for the Public Works Committee. The drawings and specifications of the proposed works may be inspected, and quantities and forms of tender obtained, at the office of Henry E. Stilgoe, M.I.C.E., city engineer and surveyor, Council House, Birmingham, where separate tenders for each road are to be sent on or before Sept. 28 endorsed "Tender for Private Street Works." Fair wages clause.

Sept 29. Durban, Natal.—*Supply and delivery ("free on board") of two miles each of 6-in., 7-in., and 8-in diameter stoneware sewerage pipes*, for the Corporation, from manufacturers only. Specifications can be obtained from W. H. Radford, C.E. Albion Chambers, Nottingham, consulting and representative engineer to the Corporation, on deposit of £1 1s. Sealed and endorsed tenders must be delivered to Webster, Steel & Co., Agents to the Durban Corporation, 5, East India Avenue, Leadenhall Street. E.C., on or before Sept. 29.

Sept. 29. Gosport and Alverstoke.—*Supply of the following materials*, &c., for the year ending Sept. 29, for the Gosport and Alverstone U.D.C. Broken stone for macadamising; kerb, channel and sets; artificial paving stone; stoneware draining pipes; cement and lime; castings; ironmongery. Specifications, forms of tender, &c., may be obtained from the Surveyor to the Council, H, Frost, Town Hall, Gosport, Tenders, sealed and endorsed "Tender for ——," as the case may be, should be delivered, with any necessary samples, at the offices of the Council not later than 12 o'clock noon on Sept. 13. Fair wages clause.

ept. 29. Walmer.—*Construction of 804 yards lin. stoneware sewers*, 8ins., 9ins., and 12ins. in diameter; also 512 yards lin. surface-water drains, 9ins. and 12ins. in diameter, with the necessary manholes, &c., for the U.D.C. The proposed works are to be constructed in accordance with plans, specification, &c., which may be inspected at the Council offices, on application to H W. Barker, engineer and surveyor to the Council, from whom copies of the specification and quantities may be obtained on payment of a deposit of £3 3s. Tenders, sealed and endorsed "Sewerage," must be sent to F. W. Hardman, clerk to the Council, 4 and 5, Park Street, Deal, not later than Sept. 29.

Oct. 1. Hutton.—*Construction of about 400yds. of stoneware sewer* in the parish of Hutton, for the R.D.C. The plans and specifications may be seen of Messrs. Jones, Council's engineers, Parliament Mansions, Victoria Street, Westminster, S.W., where bills of quantities and forms of tender may be obtained upon payment of the sum of £3 3s. Sealed tenders, on the form and in the envelope provided, must be delivered at the office of C. Edgar Lewis, clerk to the Council, New Road, Brentwood, not later than 12 noon on Oct. 1.

Oct. 1. East Grinstead.—*Sewering (sewage and surface water) and contingent works*, for the U.D.C. in Morton Road, Coronation Road (part of), Stockwell Road (part of). The drawings and specification may be seen and the form of tender or other particulars obtained from W. E. Woollam, engineer and surveyor to the Council, during the usual office hours on depositing postal order value £1. Tenders must be sent to E. P. Whitley Hughes, clerk to the Council, endorsed "Tenders for Roads, Sunnyside," on or before October 1. The contractor whose tender is accepted will be required to enter into a bond with two sureties for the proper performance of the works. A separate sum must be submitted in the form of tender for each of the roads mentioned.

Oct. 2. Walsall.—*Construction of detritus tanks, bacteria filters* and other incidental work in connection with Mosspit's Sewage Disposal Works, near Walsall, for the U.D.C. of Brownhills, Plans and specifications may be seen at the offices of the engineers, Willcox & Raikes, 63, Temple Row, Birmingham, from whom bills of quantities and form of tender may be obtained on payment of a deposit of £2 2s. Sealed tenders, in envelopes supplied, endorsed "Mosspits Sewage Disposal Works," to be delivered to T. H. Stanley, clerk to the Brownhills U.D.C., 36, Bridge Street, Walsall, not later than Oct. 2.

Oct. 2. Hove.—*Constructing a brick sewer in Langdale Road, concrete and stoneware pipe sewers* in New Church Road and Wish Road, and other works. Plans, specification, and form of contract may be seen, and bills of quantities and form of tender obtained, at the office of H. Hamilton Scott, borough surveyor, on payment of £5 5s. Tenders, on the forms provided, endorsed, "Tender for Main Drainage Works, Contract No. 2." addressed to H. Endacott, town clerk, Town Hall, Hove, will be eceived up to 6 p.m. on Oct. 2.

Oct. 2. Chipping Campden.—*Provision, laying, and jointing of cast-iron and stoneware pipe sewers, together with manholes and lampholes, construction of pump well, engine house, liquefying tanks*, and other incidental works, in accordance with the drawings and specification prepared by the engineers for the R.D.C. Drawings and specification may be seen and bills of quantities and form of tender obtained at the offices of Willcox and Raikes, engineers, 63, Temple Row, Birmingham, on payment of a deposit of £3 3s. Sealed tenders, in envelopes supplied, endorsed "Moreton-in-the-Marsh Sewerage—Contract No. 1," to be delivered to O. H. New, clerk to the Council, Chipping Campden, not later than 12 o'clock noon on Oct. 2.

Oct. 4. Pressall-with-Hackinsal. — *Trial Borings* for various parts of their district for the R.D.C. Particulars may be obtained from Walter J. Lomax, A.M.I.C.E., engineer, 11, Fold Street, Bolton Sealed tenders endorsed "Pressall Sewerage" to be in the hands of J. Cunning, clerk to the Council, Council Offices, Pressall, near Preston, not later than Oct. 4.

Oct. 4. Weymouth.—*Construction of surface-water sewers* within the district of the Borough of Weymouth and Melcombe Regis for the U.D.C., comprising about—501ft. lin. of 21-in. cast-iron pipe sewers, 700ft. lin. of 18-in. cast-iron pipe sewers, 124ft. lin. of 15-in. cast-iron pipe sewers, 100ft. lin. of 12-in. cast-iron sewers, 1,332ft. lin. of 9-in. cast-iron pipe sewers, 400ft. lin. of 8-in. cast-iron pipe sewers, 10,481ft. lin. of 6-in. cast-iron pipe sewers, with the necessary outlet, flap chamber, overflow weir, manholes, gullies, and other works in connection therewith. Plans, sections, specification, and conditions of contract may be seen and quantities and form of tender obtained on payment of £2 2s. on application at the office of the Borough Engineer, W. Barlow Morgan, Municipal Offices, Weymouth. Tenders, enclosed in the official envelope, sealed and endorsed "Surface-water Drainage," to be delivered to H A. Huxtable, town clerk, Municipal Offices, Weymouth, on Oct. 4 by 12 o'clock noon.

Oct. 6. Skipton.—*Construction of detritus tanks, sedimentation tanks, continuous filters, the laying-out of about 20 acres of land, the construction of a storm-water bed and main*, and other works in connection with the Skipton U.D.C. sewage disposal works The drawings may be seen and a copy of the specification, schedule of quantities, conditions of contract, and form of tender obtained on application to J. Mallinson, Council's engineer, Town Hall, Skipton, on payment of £2 2. Sealed tenders, in envelopes to be supplied, are to be delivered to R. Wilson, clerk to the Council, not later than Oct. 6.

TIMBER.

Oct. 11. Cape Town.—*Supply and delivery of creosoted red deal blocks, also Australian or other hard-wood blocks*, including South African wood blocks. The blocks are to be 5 ins. deep, 3 ins. wide, 9 ins., 8 ins. and 7 ins. long for the Corporation of the City of Cape Town. The total area to be paved with wood is approximately 43,555 superficial yards, including the tramway tracks, it being the intention of the Council to select several kinds of wood for testing purposes. Specifications may be seen and forms of tender and full information obtained upon application at the offices of Davis & Soper, Agents of the Corporation of the City of Cape Town, 54, St. Mary Axe, London, E.C. Tenders, under seal, and endorsed "Tender for the Supply of Wood Blocks," must be delivered to the Agents not later than 4 o'clock p.m., on Oct. 11; and samples not later than 4 o'clock p.m. on Oct. 4. No tender will be considered unless submitted upon the official form.

MISCELLANEOUS.

Sept. 28. Malta.—*Supply of stoneware pipes and "specials."* Tenders are to be accompanied by a deposit of £50, to be made in the office of the Crown Agents by tenderers residing in Great Britain, not having a representative in Malta, and in the Receiver-General's office by local tenderers. Particulars, specifications, &c., may be obtained on application at the office of the Receiver-General, or to the Crown Agents for the Colonies, Whitehall Gardens, London. Tenders will be received at the office of the Receiver-General and Director of Contracts, Valletta, up to 11 a.m. on Sept. 28.

Sept. 30. Egypt.—*Supply to the Egyptian State Railways of 3,500 metric tons of slow setting artificial Portland cement*, divided into four shipments (one of 950 tons and three of 850 tons each). during a period of one year from the date of acceptance of offer. Tenders must reach the general manager, Egyptian State Railways, Cairo, nat later than noon on Sept. 30. A deposit of £E100 is required to qualify any tender. The specification may be seen at the Commercial Intelligence Branch of the Board of Trade. 73, Basinghall Street, London, E.C.; copies may be obtained from Lieut.-Col. Western, R.E., C.M.G., Queen Anne's Chambers Westminster, S.W., on payment of 4s. per copy.

Oct. 2. Leatherhead.—*Supply of the following materials and labour* for the year ending Sept. 30, 1907:—Flints and gravel, team labour, provender, stoneware pipes, cement, disinfectants, ironmongery, brooms, &c., smiths' work for the U.D.C. Specification and forms of tender can be obtained at the office of J. E. Smales, surveyor, Council Offices, Leatherhead. Tenders to be submitted, under cover, addressed to the Clerk, U.D.C., Council Offices, Leatherhead, on or before Oct. 2, at 5 p.m., endorsed "Tender for ——."

TOO LATE FOR CLASSIFICATION.

Sept. 28. Inchmarnoch.—*Erection of teacher's house* at Inchmarnoch Public School, for the Glenmuick and Tullich School Board. Plans and specifications may be seen with J. Simpson, Union Bank, Ballater; or with Jenkins and Marr, C.E. and architects, 16, Bridge Street, Aberdeen, who will receive tenders not later than Sept. 28.

Sept. 29. Huntly.—*Erection of block* of buildings consisting of shops and dwelling-houses on Bogie Street, Huntly, for W. Loggie, Esq. Plans and specifications to be seen with, and offers received by, T. G Archibald, architect, 27, Duke Street, Huntly, up to 1 p.m. on Sept. 29.

Oct. 2. Penalltau.—*Erection of semi-detached villas at Penalltau*, Ystrad-Mynach. Plans and specification can be seen and bills of quantities obtained at the architect's office, Station Road, Bargoed, on payment of £2 2s. Sealed and endorsed tenders to be sent to E. M. Hann, Aberaman, Aberdare, on or before Oct. 2.

Oct. 2. Cardiff.—*Erection of a warehouse in Millicent Street*, Cardiff. Drawings and specification can be seen at the office of J. H. Phillips, F.R.I.B.A., architect, Clive Chambers, Windsor Place, Cardiff, and quantities can be obtained upon payment of £1 1s, Sealed tenders to be delivered to J. H. Phillips on or before Oct. 2.

Oct. 2. Treherbert.—*Alterations and additions to Co-operative shop, Treherbert*, for the Ton Industrial Co-operative Society (Limited). Plans and specification may be seen at the office of W. D. Morgan, M.S.A., architect, Post Office Chambers, Pentre. Sealed and endorsed tenders to be delivered to the Chairman before 5 p.m., Oct. 2

Oct. 2. Exeter.—*Plumber's and builder's work at the Guardians' Office*, New Buildings, Exeter. Specifications may be obtained at the office of R. M. Challice, architect, 14, Bedford Circus, Exeter. Sealed and endorsed tenders must be sent to A. Snell, clerk to the Guardians, New Buildings, Castle Street, on or before 12 o'clock noon on Oct. 2.

Oct. 2. Exeter.—*Painting and general reparation of the City Workhouse.* Specifications may be seen and full particulars obtained at the office of R. M. Challice, architect, 14, Bedford Circus, Exeter. Sealed and endorsed tenders must be sent to A. Snell, clerk to the Guardians, New Buildings, Castle Street, on or before 12 o'clock noon on Oct. 2.

Oct. 3. Salisbury.—*Painting the exterior of the Council chambers.* Specification and form of tender can be seen at the City Surveyor's Office, Endless Street. Tenders to be delivered to F. Hodding, town clerk, Municipal Offices, Salisbury, not later than 12 noon, Oct. 3.

Oct. 3. Beeston.—*Forming, metalling, paving, making good, &c., private streets* at Beeston, known as Trafalgar Road, Victory Road, and Rylands Road, for the U.D.C. Plans may be seen, and specification and quantities obtained, from the Surveyor, Public Offices, Beeston, on payment of a deposit of £2 2s. Sealed tenders, endorsed "Tender for Private Street Works," to be sent to W. H. Redgate, clerk, Public Offices, Beeston, not later than Oct. 3.

Oct. 4. Bristol.—*Painting of a portion of the City estates.* Specifications and conditions of contract can be obtained of P. Addie, city valuer, Council House, Bristol, on payment of £1 1s. Tenders are to be delivered at his office, and endorsed "Tenders for Painting," not later than 10 a.m. Oct. 4.

Oct. 6. Cwm.—*Erection of new Baptist Chapel*, Cwm. Drawings and specifications may be seen at the office of N. G. Lewis, F.I.A.S., architect and surveyor, Oak Street, Abertillery. Tenders, endorsed "New Chapel, Cwm," to be in the hands of the Secretary, H. Howells, 9, Railway View, Cwm, Mon., by noon, Oct. 6.

Oct. 10. Bangour.—*Erection of Recreation Hall* at Bangour Village for the Edinburgh and District Board of Lunacy. The relative schedules for the masonry, steel, and iron, plumber, plaster, slater, and glazier works obtained on application to H. J. Blanc, R.S.A., architect 25, Rutland Square, Edinburgh. where the specification, plans, and the general conditions of contract will be exhibited. The schedules shall be priced and extended, and lodged with J. Kyd, clerk and treasurer, Chambers of District Board, Castle Terrace, Edinburgh. not later than Oct. 10, along with the tender, each enclosed in a separate cover, to be supplied. All the documents issued must be returned with the tender.

Oct. 11. King's Lynn.—1. *Cleaning and washing down kitchen walls and ceiling.* 2. Cleaning, colouring and painting upper ward and staircase male infirmary, for the King's Lynn Union. Specifications to be seen at the Workhouse. Tenders to be sent to R. C. Coulton, clerk to the Guardians, Lynn, on or before Oct 11.

Oct. 11. Monaghan.—*Erection of a boundary wall* in accordance with plan and specification, which may be seen at the Board-room of the Monaghan Asylum, between the hours of 10 a.m. and 5 o'clock p.m. on any week day. Tenders to be forwarded by registered post, endorsed "Tender for Boundary Wall." Tenders to state the names of two solvent securities who will be prepared to enter into a bond conditioned for the due fulfilment and for the completion of the contract by such date as the Committee may determine. Tenders will be opened and considered at the meeting of the Joint Committee of the Monaghan Asylum on Oct. 11.

Oct. 13. Bridgend.—*Erecting a Mortuary, &c.*, at the Bridgend and Cowbridge Workhouse. Plans, &c., may be seen, and all particulars obtained, at the office of P. J. Thomas, architect, Bridgend. Tenders endorsed "Mortuary," to be received by R. Harmar Cox, clerk, Union Offices, Bridgend, before Oct. 13.

Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, *Great New Street, Fetter Lane, E.C.*

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Bournville (Birmingham).—For the erection of an assembly hall, &c., in Beaumont Road, for the Ten Acres and Stirchley Co-operative Society. Mr. Francis B. Andrews, A.R.I.B.A., architect, 95, Colmore Row, Birmingham. Mr. J. K. Dale, quantity surveyor, Temple Row, Birmingham:—

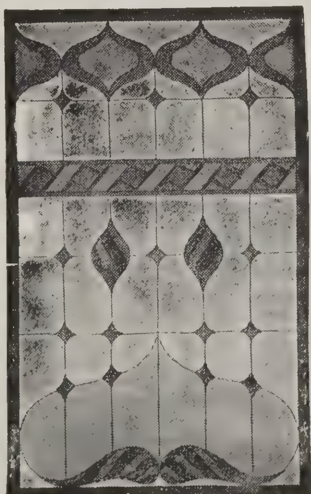
James Moffat & Sons	£1,295
Harvey Gibbs	1,247
Thomas Loud & Sons	1,200
T. A. Cole & Sons	1,180
Wm. Bishop	1,177
George Foster,* jun.	1,150
G. E. Cragg & Sons	1,094

* Accepted.

Burton Latimer (near Kettering).—For the construction of waterworks for the R.D.C. Contract No. 1, service reservoir for 119,000 gallons, and laying mains; contract 2, supply and delivery of about 560 tons of cast-iron pipes and specials, varying in diameter from 8ins. to 3ins.; contract 3, supply and delivery of sluice valves, air valves, hydrants, &c.; contract 4, supply and erection of two 17-b.h.p. gas-engines, two suction gas plants, and two sets of three-throw pumps, with gearing, &c. Messrs. Everard, Son & Pick, architects and engineers, 6, Millstone Lane, Leicester:—

Contract No. 1.

W. Morley & Sons, Keighley ...	£5,212	13	6
G. Henson & Son, Wellingborough	5,139	3	8
Goodman & Murkett, Wellingboro'	4,970	0	0
W. G. Willmott, Rushden	4,812	0	0
T. Hickman, Market Harborough...	4,665	5	0



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Johnson & Langley, Leicester	4,504	6	0
Bentley & Loch, Leicester	4,487	3	0
R. Cosford, Northampton	4,453	9	0
A. E. Nunn, London, E.C.	4,418	19	10
F. Henson, Finedon	4,272	0	0
E. Tabor, Cambridge	4,259	16	5
Davies, Ball & Co., London, S.W.	4,241	18	1
J. Moffatt, Manchester	4,234	7	11
W. Westwood, Bromyard, near Worcester	4,206	7	3
A. Jewell, Market Harborough	4,191	16	0
Langley & Westmoreland, Boston, Lincs.	4,137	8	0
R. C. Crawford, Uddingston	4,068	3	6
H. Shardlow, Nottingham	4,059	0	8
J. Riley, Cheltenham	4,055	19	6
E. Orton, Coalville, near Leicester	4,027	8	0
H. Ashley, Mansfield	4,022	16	0
J. W. Dean, Limited, London, E.C.	3,941	10	0
O. Wright & Co., South Wigston	3,917	8	10
O. P. Drever	3,792	17	6
W. Smart, Denton, Northampton	3,762	4	3
R. Wood, Bingley, Yorks	3,761	0	0
Meredith Bros., Gloucester	3,727	12	7
J. H. Macdonald, Oxford	3,726	0	0
F. Mitchell & Son, Manchester	3,723	15	5
T. Egan & Sons, Manningham	3,616	11	0
W. J. Payne*	3,494	10	0

Contract No. 2.

Cochrane & Co., near Dudley	3,315	11	3
Clay Cross Co., Clay Cross	3,164	11	0
Sheepbridge Coal and Iron Co.	3,138	4	2
Stanton Ironworks Co.,* near Nottingham	3,101	16	3

Contract No. 3.

J. Blakeborough & Sons, Brighouse	£415	14	9
Glenfield & Kennedy, Kilm'n'k, N.B.	412	16	0
J. Lees & Sons, Gomersal, nr. Leeds	407	12	6
Guest & Chrimes, Rotherham	402	19	2
G. Waller & Son,* Stroud	389	15	0

Contract No. 4.

H. T. Wright Bros., London, S.W.	2,410	16	0
J. Watt & Co., Birmingham	2,126	6	5
Salmon, Whitfield & Collett	2,017	7	0
Dynamic Gas Co., Manchester	1,982	10	0
Campbell Gas-Engine Co., Halifax	1,717	10	0
G. Lewis & Son	1,707	0	0
Railway & General Engineering Co., Nottingham	1,573	15	6
Crossley Bros., Manchester	1,536	16	0
Gimson & Co., Leicester	1,497	19	0
Ruston, Proctor & Co., Lincoln	1,448	0	0
Dougill's Engineering Co., Leeds	1,381	1	0
S. Owens & Co., London, E.C.	1,222	12	0
Pollock, Whyte & Waddel, Johnstone, N.B.	1,221	19	0
Pratchitt Bros., Carlisle	1,208	8	0
Gaywood, Fish & Co.	1,145	16	0
Death & Elwood, Leicester	1,105	6	0
G. Waller & Son	1 075	10	0
G. R. Mather & Son,* Wellingboro'	861	0	0

Rest of Kettering.

* Accepted.

Gwaun-cae-Gurwen (Glam).—For the erection of new Calvanistic Methodist chapel. Mr. Arthur S. Williams, architect, Llandilo. Quantities by architect.

Morgan Bros., Cwmgorse	£2,775	16	0
John D. Howells, Brynamman	2,756	10	0
W. D. Morgan, Glanamman	2,670	0	0
Thomas Bros., Pontendawe	2,589	10	0
Tom Edwards, Gwaun-cae-Gurwen	2,450	0	0
John Williams, Cwmgorse	2,425	0	0

Henley-on-Thames.—For converting the school buildings adjacent to the workhouse into an infirmary, for the Guardians of Henley Union. Messrs. Charles Smith & Son, architects, 164 Friar Street, Reading:—

C. W. Cox & Sons, Maidenhead	£1,800	0	0
W. Hawkins, Reading	1,700	0	0
McC. E. Fitt, Reading	1,665	0	0
H. W. Godwin, Reading	1,652	0	0
Martin, Wells & Co., Aldershot	1,600	0	0
Walden & Cox, Henley	1,400	0	0
H. Harris, Great Marlow	1,316	0	0
Batten Bros., Reading	1,285	0	0
M. Payne & Co., Bracknell	1,280	0	0
T. Stimson,* Forest Road, Bill Hill, Wokingham	1,010	5	0

* Accepted.

Irthlingborough (Northampton).—For widening the approaches of Irthlington Bridge, for the County Council. Mr. C. S. Morris, county surveyor, County Hall, Northampton:—

Smith & Son	£1,875
G. J. Fisher	1,740
R. Marriott	1,740
G. Henson & Son	1,600
Berrill & Green	1,578
Hacksley Bros.	1,557
F. Henson	1,555
Sturgess & Sons	1,541
E. Brown & Son	1,463
Goodman & Murkett,* Wellingborough	1,259

* Accepted.

Maidstone.—For the erection of new borough police station off Mill Street, for the Watch Committee:—

Barden & Head	£9,100
Elmore & Son	8,918
H. J. Smith & Son	8,475
Cox Bros.	8,303
R. Avard	8,289
Corben & Son	7,980
Wallace & Son,* Maidstone	7,778

* Accepted.

New Fryston (Yorks).—For the construction of 720yds. of earthenware and cast-iron pipe sewers, 9in. diameter, with the necessary valves, manholes, &c.; also for the several works to be constructed on the outfall field, comprising tanks, distributing carriers, &c., for the Pontefract R.D.C.:—

Mitchell & Son, Manchester	£2,064	0	0
Freeman & Sons, Hollingwood	1,907	10	3
Hooper, Neary & Co., Greenwich	1,698	5	0
Braithwaite & Co., Leeds	1,696	1	4
W. Brigg, Eccleshill	1,606	0	0
Ward & Tetley, Bradford	1,588	13	0
J. Totty, Bradford	1,574	16	11
Graham Bros., Huddersfield	1,470	0	0
Morley & Sons, Keighley	1,464	1	0
J. W. Broadhead, Purston	1,342	9	9
J. Bentley, Bradford	1,247	15	0
Rodger & Son, Castleford	1,210	15	6

Oldbury (Staffs).—Accepted for the erection of new schools at Castle Road, Warley, for the Oldbury Education Committee:—

W. Jackson	£3,405

Stirchley (Birmingham).—For the erection of stable buildings in Hazelwell Road, for the Ten Acres and Stirchley Co-operative Society. Mr. Francis B.

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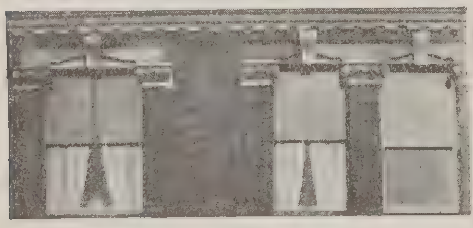

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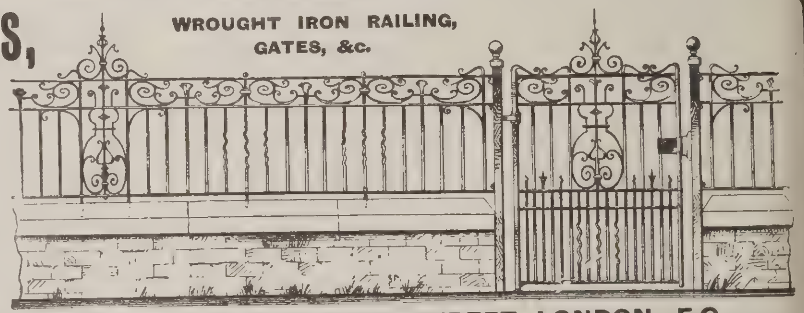

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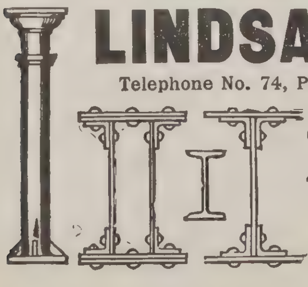

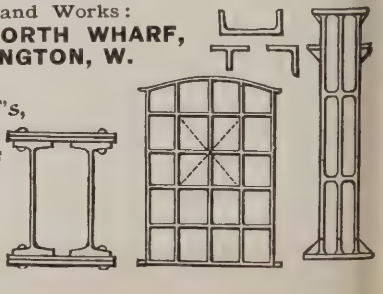

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Coming Events.

Saturday, Sept. 29.

INCORPORATED ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.—Meeting at Windsor.

NORTHERN ARCHITECTURAL ASSOCIATION.—Students' Sketching Club Excursion.

INSTITUTE OF SANITARY ENGINEERS.—Visit to Engineering and Machinery Exhibition at Olympia.

Wednesday, October 3.

INSTITUTE OF SANITARY ENGINEERS.—Mr. W. Francis Goodrich on "The Romance of Waste."

Friday, Oct. 5.

ARCHITECTURAL ASSOCIATION.—Annual General Meeting. President's Address (R. S. Balfour) and Distribution of Prizes.

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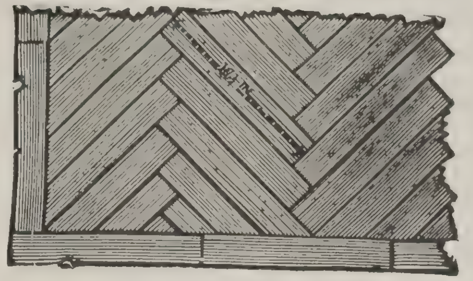

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THE BUILDERS' JOURNAL
AND ARCHITECTURAL ENGINEER.

September 26, 1906.

FIRE SUPPLEMENT (MONTHLY).

FIRE TESTS ON STONE.

A good deal of information has been published with regard to the fire-resisting qualities of certain building stones and the general effects which are known as the result of actual fires in buildings. Tests have been carried out from time to time, which have not perhaps been very thorough or systematic, but they have all brought out the distinguishing characteristics of the effect of fire. The latest tests which have been carried out recently by the geological department of the New York State Museum have been carefully made, and we give below a summary of the results obtained.

We may introduce this, however, by references to two previous American investigations into the subject. Cutting, in 1880, carried out some experiments for the "Weekly Underwriter" in order that insurance rates might be adjusted. His conclusion was that granite would not stand fire, and that granite walls were injured beyond the possibility of repair, and would have to be taken down after a fire. Sandstone he found to resist fire better than granite, while limestones and marbles were of superior value to sandstone. They seldom crack from heat and water, but when the heat is excessive they slightly crumble on the outside if water is thrown on them. When cooled without the application of water the injury is much less. If the temperature rises greater than 900 degrees Fah., and is long continued, they are changed into quicklime so as to flake off and crumble down. Conglomerates and slates show no capacity for resisting heat, as the slates crack, and conglomerates are almost immediately ruined.

Buckley.

Buckley performed a number of experiments in 1898 upon the building stones of Wisconsin which were published in "The Wisconsin Geological Natural History Survey Bulletin" of that year, which confirmed Cutting's investigations. Buckley, however, gives the reason why stones do not resist fire very well in the following words:—

"Other things being equal, it appears that a rock having a uniform texture and a simple mineralogical composition has the greatest capacity to withstand extreme heat. It is known that rocks are poor conductors of heat, and for this reason the outer shell of a rock may be very highly heated while the interior remains comparatively cold. If, after heating, the rock be quickly cooled, contraction of the outer shell takes place. The differential stresses occasioned thereby ruptures the rock and the outer shell is thrown off."

The Present Fire Tests.

As regards the latest tests on New York building stones, the details of the work were carried out by Mr. W. E. McCourt under the superintendence of Professor Heinrich Ries. Eighteen samples were selected for testing, these being types representative of those produced in New York State. A few examples are, however, not now used for structural purposes.

The samples from each locality were cut into three-inch cubes. Most investigators, who have studied the refractoriness of building stones, have selected one- or two-inch cubes; but these sizes do not give as accurate results as the larger ones, for the reason that a small piece becomes easily heated throughout the mass and consequently upon neither heating or cooling are differential stresses between the interior or exterior likely to be set up, as would be the case if larger cubes are selected. In actual fact in the burning of a building the stone does not become thoroughly heated; the heat penetrates probably but a slight distance into the mass, while the interior may remain comparatively cold. The heating and cooling of this outer shell causes strains which do not obtain in a stone which has been heated throughout its entire body. One-, two- and three-inch cubes of the same kind of stone have been tested in the laboratory, and while the smaller cubes stood fire very well, the larger ones were more affected and in some cases went to pieces. It was to avoid this error and to approach more closely the existing conflagration that the three-inch samples have been employed in the present series of tests.

Six Tests on Each Stone.

As far as the number of cubes would admit, six tests were made on the stone from each locality, four furnace and two flame tests. For the first set of experiments a Segar gas furnace was used, thus allowing the cube to be gradually and evenly heated. An opening was cut in the cover of the furnace large enough to admit the three-inch cube of stone, to which a wire had been attached to facilitate its handling.

One sample was heated at a time. The heat was applied gradually for half-an-hour until a temperature of 550° C. was reached, which was maintained for half-an-hour. The temperature was measured with a thermo-electric pyrometer. The cube was then taken out and allowed to cool in the air. A second sample was heated, as before, to 550°, and this was suddenly cooled by a strong stream of water. The third and fourth cubes were heated to 850° C., kept at that temperature for half-an-hour and cooled slowly and suddenly as in the 550° tests.

In order to approach more nearly the conflagration conditions samples were subjected to two flame tests. In the first case the cube was so placed as to be enveloped on three sides by a steady but not strong gas blast. The flame was allowed to play on the cube for 10 minutes, then the samples were allowed to cool for five minutes, after which time the flame was again applied for ten minutes, and the cube was again allowed to cool. To determine the combined action of heat and water a second cube was subjected, as before, to the flame for ten minutes, then a strong stream of water was turned on to the sample, along with the flame, for five minutes. Then the water was turned off and the flame continued for another five minutes, after which, for five minutes more the flame and water together were allowed to act on the sample.

Conclusions.

It is unnecessary for us to give the results of all these tests in detail. The generalisations which Mr. Court has drawn are, however, of interest and value. He thinks it is difficult to group the different kinds of stone in any order, for they vary among themselves, and also act differently under different conditions.

A stone which under some conditions stands up very well, will disintegrate under other conditions. Thus, for example, the granite from Northville acted very badly on fast cooling after having been heated to 850°, yet, under the combined action of the flame and water it was little damaged. Additional variations of this character all go to show that, for one temperature, the order of resistance will differ from the order given for another temperature.

At 550°C. (1,022°F.) most of the stones stood up very well. The temperature does not seem to have been high enough to cause much rupturing of the samples, either upon slow or fast cooling. The sandstones, limestones, marble and gneiss were slightly injured, while the granites seem to have suffered the least.

Temperature of Actual Fires.

The temperature of a severe conflagration would probably be higher than 550°C., but there would be buildings outside of the direct action of the fire which might not be subjected to this degree of heat, and in this zone the stones would suffer but little injury. The sandstones might crack somewhat; but, as the cracking seems to be almost entirely along the bed, the stability of the structure would not be endangered, provided the stone had been properly set.

The gneiss would fail badly, especially if it were coarse-grained and much banded. The coarse-grained granites might suffer to some extent. These, though cracked to a less extent than the sandstones, would suffer more damage and possibly disintegrate if the heat were long continued, because the irregular cracks, intensified by the crushing and shearing forces on the stone incident to its position in the structure, would tend to break it down. The limestones and marble would be little injured.

The temperature of 850°C. (1,562°F.) represents fairly the probable degree of heat reached in a conflagration, though undoubtedly it exceeds that in some cases. At this temperature we find that the stones behave somewhat differently than at the lower temperature. All the cubes tested were injured to some degree, but among themselves they vary widely in the extent of the damage.

All the igneous stones and the gneiss at 850°C. suffered injury in varying degrees and in various ways. The coarse-grained granites were damaged the most by cracking very irregularly around the individual mineral constituents. Naturally, such cracking of the stone in a building might cause the walls to crumble. The cracking is due, possibly, to the coarseness of texture and the differences in coefficiency of expansion of the various mineral constituents. Some minerals expand more than others and the strains occasioned thereby will tend to rupture the stone more than if the mineral composition is simpler. This rupturing will be greater, too, if the rock be coarser in texture. For example, a granite containing much plagioclase would be more apt to break into pieces than one with little plagioclase for the reason that this mineral expands in one direction and contracts in another, and this would set up stresses of greater proportion than would be occasioned in a stone containing little of this mineral. The fine grained samples showed a tendency to spall off at the corners. The gneiss was badly injured. In the gneisses the injury seems to be controlled by the same factors as in the granites, but there comes in here the added factor of banding. Those which are made up of many bands would be damaged more severely than those in which the banding is slight.

All the sandstones which were tested are fine grained and rather compact. All suffered some injury, though, in most cases, the cracking was along the lamination planes. In some cubes, however, transverse cracks were also developed.

The Controlling Factors.

The variety of samples was not great enough to warrant any conclusive evidence towards a determination of the controlling factors. It would seem, however, that the more compact and hard the stone is the better will it resist extreme heat. In a general way the greater the absorption the greater the effect of the heat. A very porous sandstone will be reduced to sand and a stone in which the cement is largely limonite or clay will suffer more than one held together by silica or lime carbonate.

The limestones, up to the point where calcination begins (600°-800°C.) were little injured, but above that point they failed badly, owing to the crumbling caused by the flaking of the quicklime. The purer the stone, the more will it crumble. The marble behaves similarly to the limestone; but, because of the coarseness of the texture, also cracks considerably. As has been mentioned before, both the limestones and marble on sudden cooling seem to flake off less than on slow cooling.

The Flame Tests.

The flame tests cannot be considered as indicative of the probable effect of a conflagration upon the general body of the stone in a building, but rather as an indication of the effect upon projecting cornices, lintels, pillars, carving, and all thin edges of stonework. All the stones were damaged to some extent. The limestones were, as a whole, comparatively little injured, while the marble was badly damaged. The tendency seems to be for the stone to split off in shells around the point where the greatest heat strikes the stone. The temperature of the flame probably did not exceed 700°C., so it is safe to say that in a conflagration all carved stone and thin edges would suffer. However, outside of the intense heat, the limestones would act best, while the other stones would be affected in the order: sandstone, granite, gneiss and marble.

After having been heated to 850°C., most of the stones, as observed by Buckley, emit a characteristic ring when struck with metal and when scratched emit a sound similar to that of a soft burned brick. In those stones in which iron is present in a ferrous condition the colour was changed to a brownish tinge owing to the change of the iron to a ferric state. If the temperature does not exceed 550°C., all the stones will stand up very well, but at the temperature which is probable in a conflagration, in a general way, the finer grained and more compact the stone and the simpler in mineralogic composition the better will it resist the effect of the extreme heat. The order, then, of the refractoriness of the New York stones which were tested might be placed as sandstone, fine grained granite, limestone, coarse grained granite, gneiss and marble.

SAFEGUARDING LIFE IN THEATRES.*

A Study from the Standpoint of an Engineer.

By JOHN R. FREEMAN.†

It is a fair and moderate statement that the present practice of the art of fire-prevention as applied to theatres and buildings of public congregation is from 10 to 20 years behind the fire-protection of large industrial works, and true that the fire-hazard to theatre property in general, as measured by a comparison of insurance rates, is ten times as great for the modern theatre as for the modern factory. All of this is unnecessary. It is a wrong against the public that should be righted. The safeguards needed are mostly simple. The main features of some of them are already worked out and well proved within the great factories which engineers build and manage. The additional safeguards required to be worked out or adjusted for this special case—the automatic smoke-vents, the safe proscenium curtain, the safe warming and ventilation, the proper arrangement of automatic sprinklers in stage and dressing-rooms and store-rooms—are within the field of the mechanical engineer and are mostly simple problems to solve when serious attention and skill are once directed to them.

The Lesson from Actual Fires.

I first became actively interested in this question by the burning of the Iroquois Theatre at Chicago a little less than two years ago.

The great lesson of the Iroquois fire was only a repetition of a lesson that has been given several times before and each time forgotten. The recurring formula is:—

(1) A stage crowded with scenery.

(2) The sudden spread of the flames over the scenery.

(3) The opening of a door in the rear of the stage, an inrush of air.

(4) Scant smoke-vents over the stage, an outburst of smoke under the proscenium arch.

(5) Death to those in the galleries.

In 1881, at the Ring Theatre disaster in Vienna, with about 1,800 in the audience, careless lighting ignited a "hanging border," a large door in the rear of stage was opened, letting in a blast of air that drove the smoke through the proscenium arch; the iron curtain could not be lowered; special exit doors were found locked; 450 were killed, mostly in the upper gallery.

In 1887, at Exeter, England, fire caught on a stage crowded with scenery. Within about five minutes from the outbreak of the fire 200 were killed, mostly in the upper gallery.

In 1876, at Conway's Theatre, Brooklyn, N.Y., the stage was crowded with scenery; a border caught fire; the blast of suffocating smoke was increased by the opening of large doors in the rear of stage; about 300 were killed, all in the upper gallery.

Note the suddenness, the suffocation, and the fact that the fatalities are nearly all in the galleries!

The Problem.

The amount of combustible material on the stage in a great spectacular piece is surprisingly large. It is plain that the fuel supply is sufficient to send out an enormous volume of suffocating gas. Indeed, I have computed that merely the quick burning of the 160lbs. of gauze that hung over the Iroquois stage would heat a volume of air equal to that contained in the space above the proscenium arch to 1,000 degs. Fahr. There is good testimony to the effect that only about two minutes elapsed after the first spark until all the upper scenery was in flames. Only from three to four minutes' time elapsed before the large space of the hanging-loft was so filled with fire that the flames and smoke rolled out beneath the proscenium arch into the top of the auditorium; then came suffocation and death.

The main problem is to give prompt and certain vent to this smoke and suffocating gas elsewhere than through the proscenium arch.

The Solution.

The ordinary construction with a high spacious chamber for the hanging-loft above the level of the proscenium arch makes it a simple matter structurally to keep this fire and smoke out of the auditorium, and no matter how great the mass of flaming scenery a smoke-vent of one-eight or one-tenth the area of the stage, if instantly opened, would probably have saved all of this terrible suffocation at Chicago, at Exeter, at Brooklyn, and at Vienna.

Fig. 1 shows a longitudinal-section of the Iroquois through auditorium and stage. The form is typical and about the same in all the first-class theatres. To one who has not been behind the scenes and up to the gridiron the surprising thing is the great head room, commonly 70ft. from stage to gridiron and 80ft. or sometimes 90ft. from floor to roof, and necessarily more than double the height of the proscenium arch, into which are hoisted the great sheets of canvas on which the scenes are painted.

The conditions are plainly similar to that of the fireplace in our living-room magnified 10 or 20 diameters. Note how admirably the high space over the stage screened by the arch is adapted to give the best of chimney draught and not give us a smoky fireplace. The roaring fire on our hearth sends 95 per cent. of its heat up the chimney and gives out no smoke into the room, if only the chimney be properly designed and the damper open. An ordinary rule is to make the throat of the chimney at least one-tenth the area of the fireplace opening, or it may be stated that the space through the damper should be one-eighth the area of the hearth, and when we simply provide an adequate chimney area and a damper that will surely open we shall have adopted a safeguard that would have saved four-fifths of those who perished at the Iroquois Theatre fire, regardless of defective curtain and defective exits and absence of fire-hose on the stage.

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* Summary of presidential address before the American Society of Mechanical Engineers at its annual meeting in New York City, December 7th to 9th, 1905.

† President Manufacturer's, Rhode Island and Mechanics' Assurance Companies, 815 Banigan Buildings, Providence, R.I.

Existing Regulations and Practice.

In a way it has long been recognised that there should be a large ventilator over the stage, and one city has copied from another the building law that in the case of New York reads as follows :—

> There shall be provided over the stage metal skylights of a combined area of at least one-eighth the area of the stage, fitted with sliding sash and glazed with double thick sheet-glass . . . the whole of which skylight shall be so constructed as to open instantly on the cutting or burning of a hempen cord. . . . Immediately underneath the glass of said skylight there shall be wire netting . . . &c.

The evident purpose of the thin glass is to cover the opening with something that will break out under heat if the mechanism for sliding off the cover fails. The wire-netting is to catch any piece of broken glass from falling to the stage.

The building law of the London County Council reads much the same, save that its ratio is $\frac{1}{10}$, and perhaps that is where the rule began. Some the leading American cities make the proportion $\frac{1}{10}$.

The idea of a large ventilator expressed in these rules is all right, but the execution is commonly all wrong, and needs some good engineering to provide a design of damper with careful details that will be sure to work. Note the antiquated suggestion of the burning of a hempen cord when fusible links have been used on the fire-doors in our factories for twenty years! There is no good reason to expect that the hempen cord in this position in smoky atmosphere from which oxygen had been largely removed would burn off until a majority of those in the gallery had been suffocated.

The requirement of thin glass in the building law is well meant, but it would be too slow in breaking out. Remember how quickly unconsciousness of suffocation comes in an atmosphere of smoke. The wire-netting called for is a positive danger as often applied.

Doubtless there are many good smoke-vents here and there that have been designed and built with skill and conscience, for the problem is not so very difficult; but I have not yet seen one of these vitally important pieces of apparatus in which the design had been worked out with reasonable degree of perfection of detail. The proper specification should be "Something of ample area that will be sure to open wide instantly without human intervention, and that cannot be stopped by warping, settlement, obstruction, frost, snow, rust, dirt, or ordinary neglect.

I do not know who first fixed this ratio of $\frac{1}{10}$ for size of ventilator, the same figure that appears in the rule of the London County Council. Its author might have built wiser than he knew, or may have taken it from the well-proved ratio of the fireplace chimney. It works out as safe when computed mathematically on theoretic grounds from the uncertain data. The material is so favourably disposed for ignition that the rapidity of combustion is largely a question of the air-supply. I am led by computation and precedent and the need of some factor of safety to concur in the wisdom of the ratio of $\frac{1}{8}$ or $\frac{1}{10}$ as already specified by the building laws of the great majority of our American cities, and believe it wise to base it upon the gross area of the stage floor rather than upon proscenium opening or cubical contents of the stage.

The Austrian Experiments.

Following the great theatre fire in Vienna, a committee of the Austrian Society of Engineers (Technischer Verein von Ober Oesterreich) built a model of the Ring Theatre on one-tenth of its lineal scale (which thus contained only one-thousandth of the cubic contents of the original) and made many tests and experiments.

The experiments were divided into two groups—the first comprising those in which no ventilators were opened over the stage, while in each of the experiments of the second group two ventilators were opened, having a combined area which according to the scale of their drawing was very nearly one-tenth of the area of the stage. In the first series of tests made by igniting sheets of paper hung to represent the scenery, but containing proportionally far less combustible material than is often hung on a theatre stage, they found that the expansion of the air caused by the heat quickly forced the curtain outward from the proscenium arch, and within about twenty seconds from lighting the fire this heating of the air produced an excess of atmospheric pressure much greater than that of the ordinary pressure of city gas, thereby explaining why it was that the lights in the Ring Theatre became so quickly extinguished after the outburst of the fire.

In the second series of these Austrian experiments their models of the ventilating shafts were closed by sheets of paper, and as soon as these burned open all excess of air pressure disappeared from the auditorium, and, indeed. the updraught drew the proscenium curtain inward over the stage. During these experiments an unexpected warning was given against covering smoke-vents by wire screens, for it was found the flying bits of charred paper carried up by the draught almost completely closed them.

The Committee of the Austrian Society of Engineers concluded that the outburst of flame and smoke into the upper part of the auditorium and the extinguishment of gas-lights in a theatre could all be prevented by providing adequate smoke-vents over the stage, and places these smoke-vents as the feature of first import in safe-guarding life in theatres, and says that without them emergency exits and fire-curtains will be of no avail; and in this conclusion I most heartily concur. Regarding the mechanical construction of these smoke-vents the committee says :—

"It is necessary that these be opened instantly upon the outbreak of the fire; mechanical contrivances of iron to be operated by human means will certainly fail, for according to all experiences in theatre fires thus far fright on the part of the employees prevents the use of such arrangements."

They warned against automatic contrivances whose action may be interfered with in consequence of rust or expansion by heat, and against sheet-iron valves falling inward by their own weight, which might be restrained from falling open by the excess of pressure due to updraught, and, finally, recommended that these shafts be closed by a quickly combustible tissue of hemp or jute covered with varnish or celluloid, and with a hole about $1\frac{1}{2}$ins. in diameter in the centre to invite quick ignition. Our Austrian friends were unfamiliar with the American fusible-solder link, which is certainly quicker and safer and more practical than any such tissue of varnished hemp.

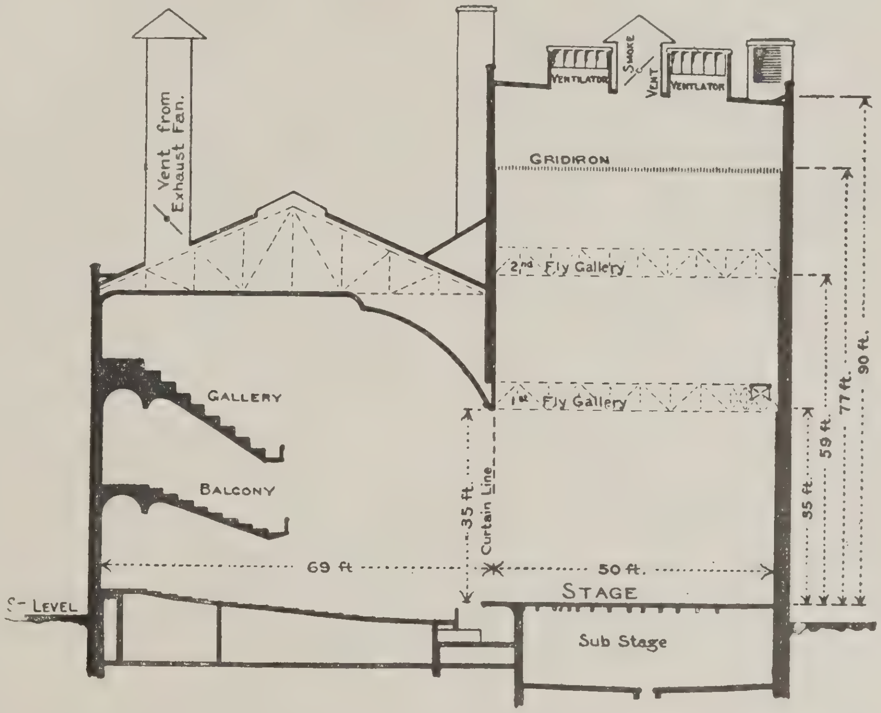


FIG. I. LONGITUDINAL SECTION THROUGH AUDITORIUM AND STAGE, IROQUOIS THEATRE, CHICAGO, ILL.

Fusible Links.

have been in common use on automatic fire shutters in our factories for nearly 20 years. Three types of these links are shown in Fig. 2. It is strange almost beyond belief how slowly and scantily these have found their way into the fire-protection of theatres.

These links melt open at about 162° Fahr., and thus will open long before flame reaches them. Their cost is trifling. Links like those shown in Fig. 2 tested to immediate rupture will break under a load of about 200 to 500lbs., but can be trusted to sustain continuously a load of only about 50 to 100lbs. All of the known solders that fuse at low temperature are subject to stretching or "cold flow" under long continued loads, unless these loads are made extremely small, and one of the most important features in the design of any such link is to make the direct stress upon the solder small and in tension over a large area rather than by shear. The links shown will open with about the same promptness as an automatic sprinkler. At the top of a rigging loft (gridiron) over a fire like that on the Iroquois stage they probably would open within 20 or 40 seconds after the blaze got a good start.

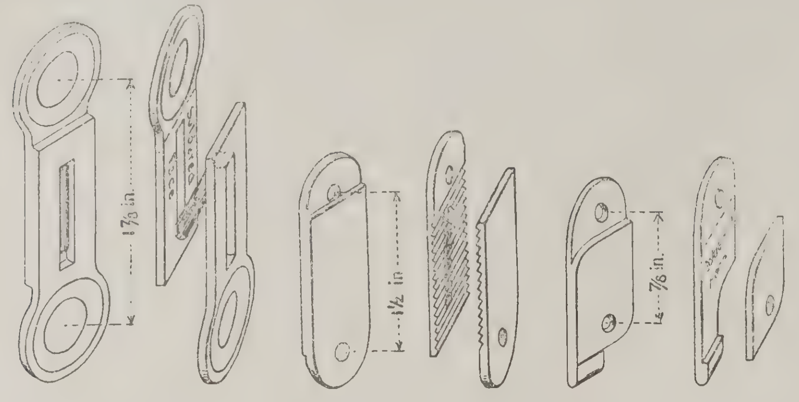


FIG. 2.—FORMS OF FUSIBLE LINKS FOR AUTOMATIC FIRE SHUTTERS.

The sensitiveness of the link or quickness of action under moderate degrees of heat depends on the thinness of the mass of metal to be warmed up and therefore on the rapidity with which it absorbs heat enough to melt the solder. These two characteristics—the weakness of the fusible solder under long-continued strain and the necessity for rapid absorption of heat—limit the strength of fusible link that can be employed. In many situations a link is desired of such form and size that when inserted in a rope it can run over the ordinary pulley.

Smoke-vent Design.

Concerning the design of smoke-vents, those I have seen in actual use have been, with hardly an exception, imperfect pieces of mechanical design. I have worked out two models shown in the accompanying drawings, Figs. 3 to 7. I am certain that with experience and constructing, one after another, these designs could be improved upon. It is best the total area of one-tenth the stage be subdivided into four independent units. The fundamental requirements are as follows:—

(1) Absolute certainty of opening by force of gravity in spite of neglect, rust, dirt, frost, snow or expansion by heat, twisting or warping of the framework.

(2) Quickness of opening to be secured by automatic links of the thinnest metal practicable, and also by controlling the doors by a cord run down to the prompter's stand and to the station of the stage fireguard.

(3) The operative mechanism of the smoke-vent should be simple and massive, designed not as a watchmaker would build it, but more according to the standards of railroad service or rolling mill practice. The counter-poise weights should be heavy and a constant tension on the release cord of upwards of 25lbs., so that rust, cobwebs or temperature changes might not be of noticeable effect in the resistance to be overcome.

(4) The vent should be of such form that it can be tested daily or at least at the weekly inspection by partially opening it, preferably closing it again by means of the cord running to the prompter's stand. It may perhaps add to the safety if it is of such design that it can be used whenever needed for the ordinary ventilation of the stage, summer or winter, rain or shine, thereby keeping it under constant view and bringing into immediate notice any difficulty about its opening or lack of repair.

In the first of these designs submitted, shown in Figs. 3 and 4, the 8ft. by 12ft. opening, of which four would be needed over the stage of ordinary size has a roof

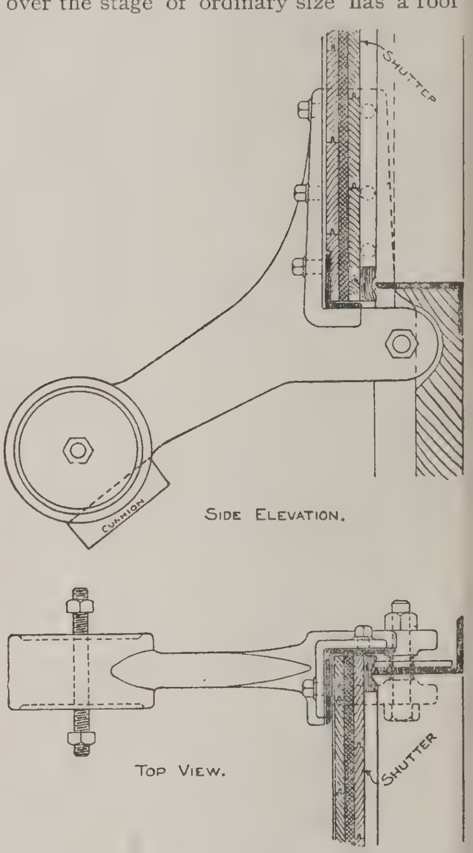
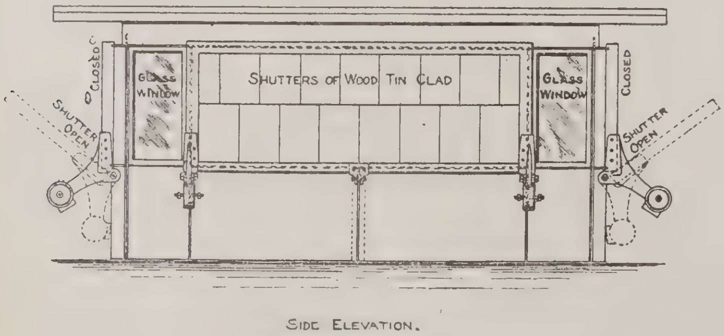


FIG. 4.—DETAIL OF COUNTER-WEIGHTS FOR HINGED SHUTTERS FOR SMOKE VENTS.



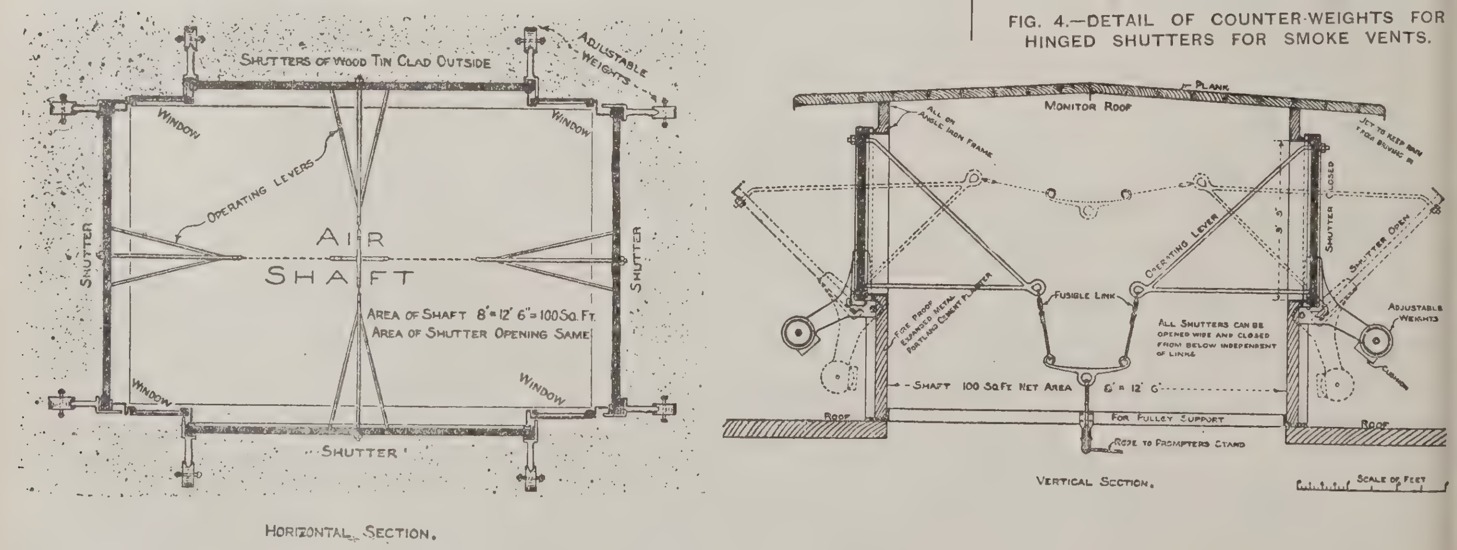


FIG. 3.—DESIGN FOR SMOKE VENT WITH HINGED SHUTTERS.

for protection from rain and vertical sides, that contain four small windows for admitting daylight to the rigging loft, but which can be closed by ordinary window shades for dark scenes. All necessity for the wire screen is avoided. The four shutters fall outward lest the pressure of the updraught tend to hold them shut, and are pulled open by force of gravity, opening to the full area called for. The pull on the rope holds them against their seat which, if made with a thin edge pressing loosely against fibrous material, as shown, will be more tight against cold-air draughts than a common window sash or house door. Fusible links are inserted in each of the four branches of the cord. No sprinkler should be placed up within the monitor containing these links, and care should be taken that the links are of a thin, quickly sensitive type.

In the second design (Figs. 5 and 6) the sliding type is used. This obviously cannot be used as an ordinary ventilator on rainy days. The special effort in remodelling this from the current New York type has been, first, to place the glass in the vertical side so that no necessity for a wire screen remains. Second, to provide a better track and trucks and arrange the joints so that the leakage of air through the clearance space would not tempt the janitor to close the space by something that may interfere with it sliding open.

A third sketch (Fig. 7) shows an arrangement of a safety ventilating shutter that sometimes can be conveniently placed in the brick wall near the top of the rigging loft.

Automatic Sprinklers.

The second safeguard in order of importance is in my opinion a complete equipment of automatic sprinklers over the stage and throughout all rooms and nooks and corners except in the auditorium.

It has been claimed that under the high rigging loft of a theatre sprinklers at a distance of 60ft. or perhaps 80ft. above the floor of the stage would be so remote from the flames that they would not open with sufficient promptness to be of material service. I am confident that this is untrue. The hot air from a fire quickly travels over a vertical distance of 60ft. or 80ft. Not more than five to ten seconds' time would be required for this, and the conditions for pocketing and confining the heat in a small area in the top of the rigging loft of a theatre are much more favourable than in many portions of factories where sprinklers are found to work successfully. One series should be placed below the gridiron, and, preferably, another series above it, these not being vertically over one another. Those in the top series are as likely to open first, but it is well to be liberal, and provide both series. A line should also run along the lower outer edge of each fly gallery. With care, a skilful sprinkler fitter can readily place and guard all the heads and pipes so that the danger of breakage need be no greater than in a factory. The 162-degree solder should be used.

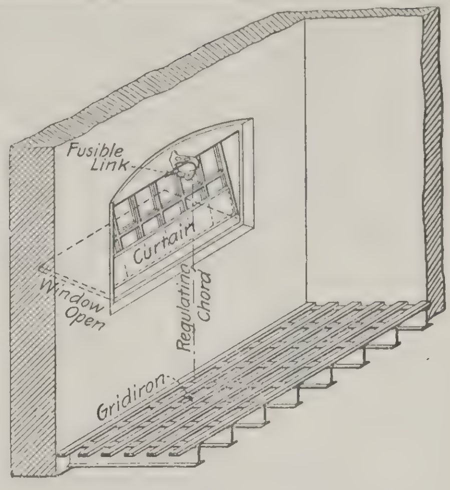


FIG 7. DESIGN FOR SMOKE VENT IN BRICK WALL AT TOP OF RIGGING LOFT (GRIDIRON).

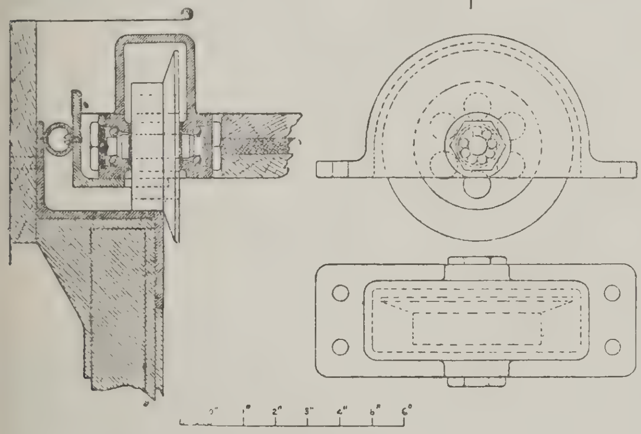


FIG. 6. DETAIL OF ROLLER AND ROLLER TRACK FOR SLIDING SHUTTERS FOR SMOKE-VENT.

Fire Curtains.

The third of the safeguards demanding investigation is the curtain for closing the proscenium arch. With good smoke vents and thorough automatic sprinkler protection over the stage and with ample stairways from galleries, it is probable that the audience could escape from a situation as bad as that in the Iroquois, even though there were a very poor fire curtain, or perhaps no curtain at all; but in theatres as in factories, it is wise to have a second, and even a third, line of defence, lest the first happen to be inoperative in the moment of need. The fire curtain for covering the opening under the proscenium arch in nearly all American theatres outside Chicago at the present time is made from a heavy canvas woven from an asbestos fibre; and in English theatres the asbestos curtain appears to have been steadily gaining in favour because of its less weight and smaller cost in comparison with a curtain of sheet iron, stiffened by ribs. In Chicago the failure of the Iroquois asbestos curtain and the excellent corrugated iron curtain of the auditorium—both in evidence—has made the steel curtain become the rule. These steel curtains merit little criticism except the absence of a positive down-haul and better holding and guiding in iron channels at the edge. Like nearly all steel ribbed shutters they will warp and twist off their seats under 10 to 15 minutes of exposure to a severe fire unless securely held at edges, and should smoke vents be closed and sprinklers lacking and a back door open, their loose fit would let volumes of suffocating smoke and tongues of flame pass into the auditorium. With the smoke vents open and the draft therefore inward, they will serve their purpose until the audience has escaped and the firemen have arrived.

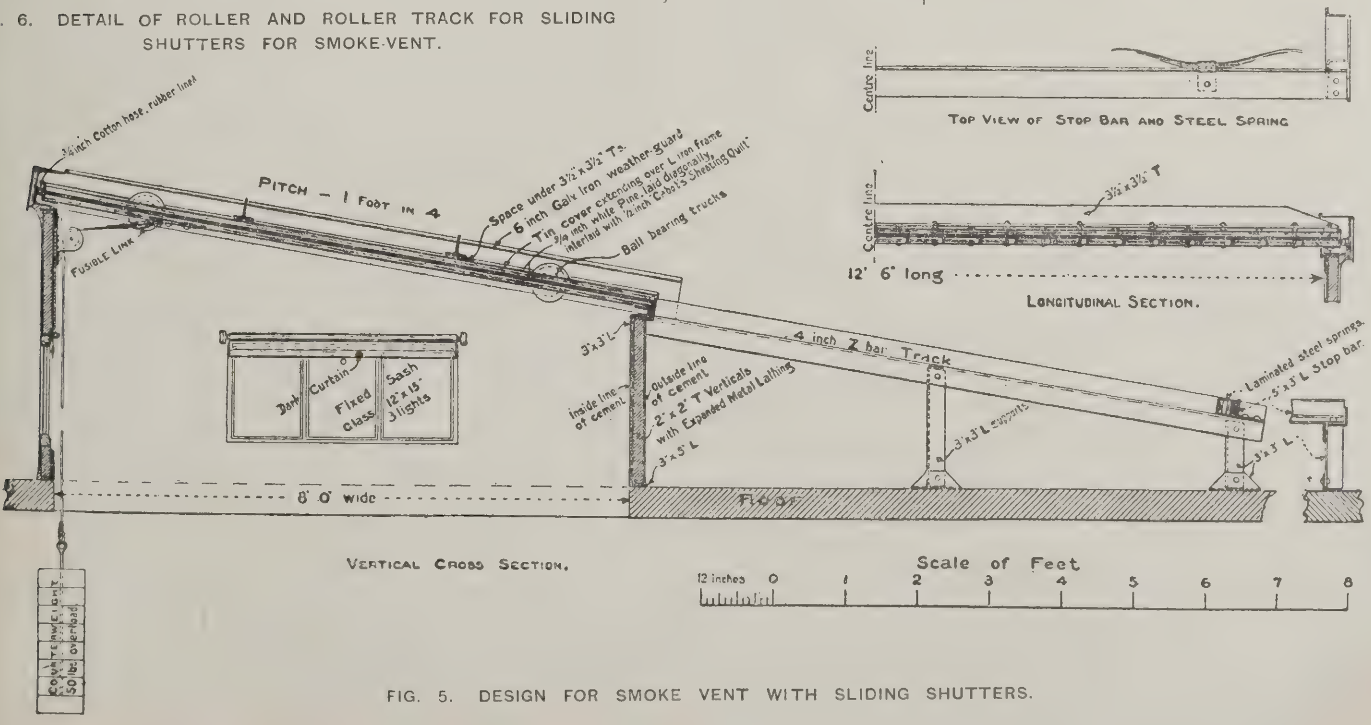


FIG. 5. DESIGN FOR SMOKE VENT WITH SLIDING SHUTTERS.

After having investigated the question of **fireproofing the scenery.** I am led to believe that we must, after all, rely on the safeguards of the engineer rather than those of the chemist. The efficient fireproofing of the great quantity of white pine used in frames, battens, and profiles (8,000 sq. ft. in the case of the Iroquois) appears to be a practical impossibility. The 11 miles of Manila ropes cannot be "flame-proofed" without too great sacrifice of their strength.

HOUSE AT HOMERTON, ENTIRELY GUTTED IN 1899, BUT THE VULCANITE ROOF AND CONTAINING WALLS REMAINING INTACT ARE STILL IN USE.

The great lesson out of all the theatre fires as to the danger to those in the gallery should not be forgotten in designing the **stairways and fire escapes.** The area, the total number of stairway exits, and the total width of stairway per 100 persons should be two or three times as great for the gallery as for the other parts of the house, and all exits should run in such a direct and obvious course that with a person once in them he could not fail to find his way to the bottom, although in total darkness. The flights of stairs should be each of the fewest steps practicable, with frequent landings on which one can steady himself, and with good, simple, continuous handrails that can be followed down each side, and a strong centre rail, continuous all the way, where wide stairs are necessary.

As to the aisles and exits a great deal of cutting out and enlarging of aisles and removal of seats was done immediately after the Iroquois fire, apparently without reflection that to deliver the crowd from the seats at the doorway with too great a rush increased the danger of crushing on the stairs. The narrowest aisle permitted in a theatre even close to the stage, is commonly 30ins. In a Pullman car and in the ordinary railway coach 22ins. and 20ins. is found ample for a crowd of people moving along with all necessary speed in single file.

It is far better to introduce additional aisles at the expense of making all the aisles narrower, thus lessening the tendency in a mad rush for people to try to crowd past one another, and giving better chance for those who are not strong to steady themselves by holding on with their hands to the seats on both sides the aisle as they go along towards the exit.

Another feature that is worthy of note is that it is not essential for safety that a theatre should stand in an open lot. Some of the worst theatre fires in history have happened where the theatre was open on three sides or four sides. It is far more important that attention be given to the details of fire walls and to providing passages.

In safeguarding our factories against fire we find **systematic inspections** and the filing of a weekly report one of the very best means towards safety. They would be of equal value for the theatre. A printed blank can readily be devised for each case. This should cover the completeness and operative condition of all valves, fire hose, sprinklers, fire pails, soda water extinguishers, hooks, fire doors, exit locks and latches, smoke-vents, fire curtain mechanism, and particularly of the neatness, cleanliness, and order of every room, passageway, closet, air chamber, loft, basement and fly gallery, used as a part of the theatre building. This inspection should be made on each Monday afternoon, since the week-end is the time when attractions are commonly changed and the confusion of new sets is most apparent.

FIRE-RESISTING ROOFS.

Vulcanite roofing in various forms has now been utilised in Great Britain and the Colonies for quite a number of years, and the present holders of the various patents are able to execute their work as based on quite 10 years' experience.

Vulcanite roofing, as is, of course, well known, comprises a bituminous, hornlike and elastic substance, which, whilst retaining its elasticity permanently, soon has an outer surface of metallic hardness which is absolutely impervious and offers hermetical resistance to water and air, whilst its hermetical nature is of the utmost importance as a water-proofing quality, and has in the first instance given it its reputation. It is this same hermetical resistance which plays such an important part in Vulcanite roofing as a fire resistant. As a result of the roofing being not only incombustible but air-tight, the draught which gets through ordinary tile roofing, slate roofing, and many other forms of metallic roofing at the joints is not created so as to fan any fire occurring below. Incombustible from above and air-tight from below, the roofing practically affords an ideal protection.

For this reason the fire insurance offices favour Vulcanite roofing. It is to be looked upon, also, as a safeguard even for concrete roofs, which are so often finished with cement or asphalt. It is well known, however, that cracks occur in concrete roofs, that expansion and contraction frequently affect them, and that both cement and asphalt fracture along these cracks, so failing to afford those water-tight and air-tight qualities which are so desirable and continually requiring repair.

VULCANITE ROOF OVER MODERN FACTORY USED AS ROOF TANK TO STORE 50 TONS OF WATER FOR FIRE EXTINGUISHING PURPOSES.

As always occurs with any method of construction when newly introduced, it had to meet a certain amount of opposition.

For instance, the point was raised, whether Vulcanite roofing was incombustible within the meaning of the London Building Act. The whole question was first brought before the Court, which upheld its incombustibility. The opponents were, however, not satisfied, and the matter was carried to the Appeal stage, when they were again beaten, the High Court finally considering the material incombustible within the meaning of the Act, and the opponents had to pay costs.

Fire Tests.

But apart from the commonsense view taken by the Court on the subject of fire resistance, Messrs. Vulcanite, Ltd., have been at pains to demonstrate the matter popularly, commencing as far back as 1899 with a public test at Wolverhampton, when two buildings covered with slate and Vulcanite roofing respectively were under test, resulting in the entire destruction of the slate roof, whilst Vulcanite roofing remained intact. Then there was the official test of the British Fire Prevention Committee, also in the form of a comparative test between a slate roof and a Vulcanite roof, and here again, whilst the slate roof was entirely consumed, the Vulcanite roof remained intact. We reproduce photographs showing this, as also a detail of the construction.

Actual Fires.

But even if the definition of the Court as to its fire resistance and public and official experiment had not proved the case, there were additional instances of actual fires, the most notable being one at Messrs. Boyes' works and Messrs. Roylance's works. In the former case the fire was an exceptionally severe one, yet although the whole of the woodwork near the roof was badly scorched and charred, the absence of air prevented the fire from getting a thorough hold of the roof, and no flame or smoke penetrated the roof surface at any point—in fact, the top surface was quite intact.

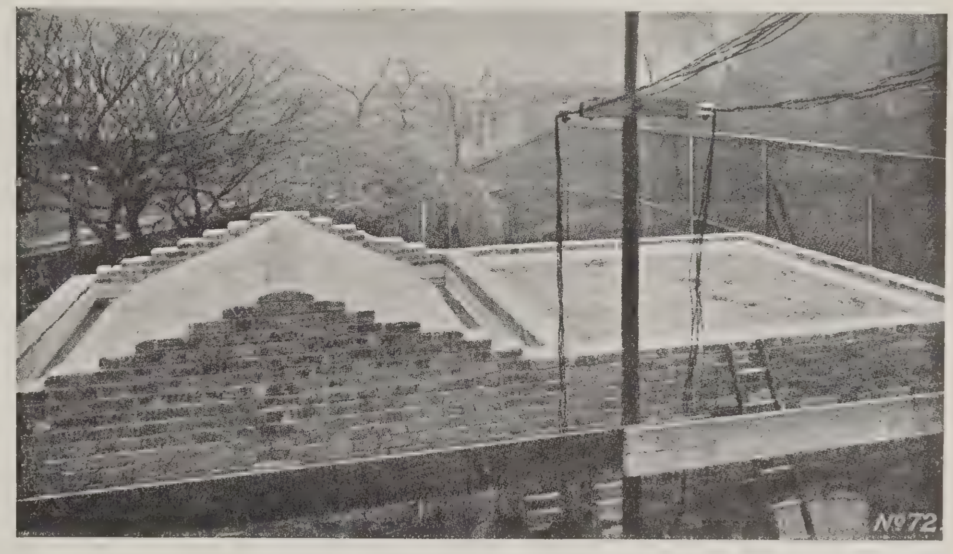
Whilst these two instances were from larger buildings—*i.e.*, works—there have been also instances in smaller property as, for instance, at Rushmore Crescent, Homerton, N.E., where, although in this cottage property there was a "burn out" which resulted in the insurers having to pay £300, and the interior of the cottage was entirely gutted, the roof remained and, as a matter of fact, served as a route of escape for the occupants. As this is rather an interesting case, we are illustrating the building six months after the fire under reconstruction, the original roof being in place.

At a period when so much is being done in the Metropolis with a view of increasing the safety of buildings from fire, it would be well for architects to consider the advantages of Vulcanite roofing where flat roofs are required. With the fire service they are, of course, infinitely more popular than lead or zinc flats, which are such sources of danger during fire brigade operations owing to the low temperatures at which these materials melt.

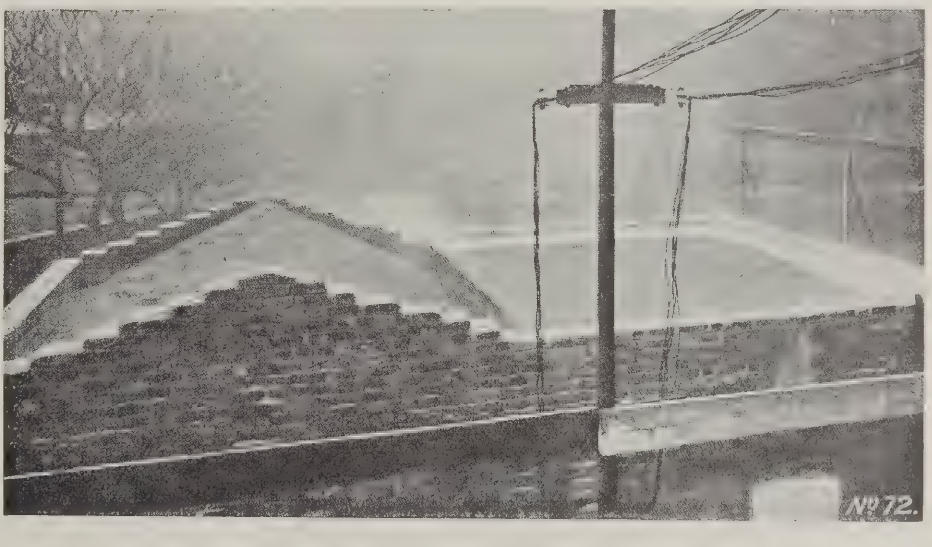
It is pleasant to observe that no less an authority than Mr. J. Belcher, A.R.A. (until recently President of the R.I.B.A.), covered the Royal London Friendly Society's new premises in Finsbury Square with Vulcanite roofing, which shows that it is holding its own in buildings of architectural pretensions, as well as in the more utilitarian factory and warehouse buildings.

It is not our purpose to enter into the different classes of buildings which Messrs. Vulcanite, Ltd., have covered in such large numbers, and which vary from public buildings to cottage property and from factories to high-class business premises; but in one case we would, however, illustrate an example which has considerable importance from the fire point of view—namely, a roof at Messrs. Leal's factory, where Vulcanite roofing has been taken up around the actual roofing surface, so that a tank can be formed with a reserve of water for fire extinguishing purposes, the water itself also, of course, being a non-conductor.

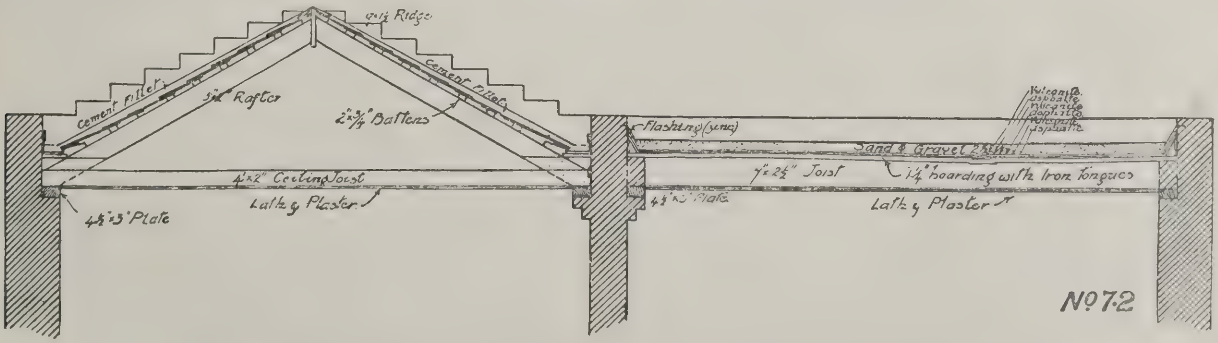
One of the great difficulties of factories is to have a sufficient supply of water for their sprinkler and hydrant systems, and there is a growing tendency to utilise roof surfaces as a large tank, whereby the whole



VIEW OF VULCANITE AND SLATE ROOFS BEFORE FIRE TEST.



VIEW AFTER ONE HOUR FIRE TEST, SHOWING VULCANITE ROOF INTACT AND SLATE ROOF DESTROYED.



DETAIL OF SLATE ROOF. DETAIL OF VULCANITE FLAT ROOF.

THE FIRE-RESISTANCE OF VULCANITE FLAT ROOF v. SLATE ROOF: SECTION OF TESTING CHAMBER.

of the top of the floor is also now much cooler than would otherwise be the case.

We see in the application of this roofing a material addition to the fire resistance of the Metropolis, and an advance upon the slate or tile roof of old, which is certainly most unsuitable for many of the buildings of our larger cities.

Economically, perhaps we should add, this roofing also has certain advantages, and generally speaking, quite apart from any question of fire resistance, calls for serious consideration. We are pleased to observe that the Government departments and municipalities have taken it up as being both practical and economical, and that with the modern tendency to utilise the roof surface as so-called roof gardens or roof yards. there should be a growing field of application.

Last but not least, the many new works in connection with the covering of projecting shops should give Messrs. Vulcanite, Limited, a largely increased field of activity in the Metropolis.

CHIMNEYS AND FLUES.

A special committee of the National Fire Protection Association of the United States appointed to consider the question of chimneys and flues reports in general terms and not in the customary draft clauses for a building code. The committee thinks that all heat conveying flues should be free from all contact with inflammable materials, should have a free ventilating space surrounding them, should be securely built and supported, should be so placed that they can be readily reached so as to clean them off on the tops; the distance from inflammable materials is to a great extent dependent upon the construction of the flue, the temperature of the heat passing through it, and the continuous length of time the heat is passing through.

In all chimneys and flues of brick construction, only good, hard, well-burnt brick should be used; soft brick should be prohibited; all joints should be struck smooth on inside excepting where the flue is lined with well-burnt clay or terra-cotta pipe; no pargeting mortar shall be used on the inside; for bake ovens, low-pressure boilers and similar purposes the brickwork shall be at least 8ins. thick and lined continuously on the inside with well-burnt clay or terra-cotta pipe and be capped with terra-cotta, stone or cast iron; for high-pressure boilers the brickwork shall be not less than 12ins. thick with the inside 4ins. of this wall built up of fire-brick laid in fire mortar for a distance of 25ft. in any direction from the source of heat; for smelting furnaces or of steam boilers or other apparatus which heat the flues to a high temperature, shall be built with double walls of suitable thickness for the temperature, with an air space between the walls, the inside 4ins. to be of fire-brick laid in fire mortar for a distance of not less than 25ft. in any direction from the source of heat. All other chimney flues shall be lined continuously on the inside with well-burnt clay or terra-cotta pipe made smooth on inside from the bottom of the flue or throat of the fire-place if the flue starts from the latter; chimneys not in continual use, or in dwellings from fire-places or stoves, need not be lined, but must be struck smooth on inside. It is not advisable to have any bends or curves requiring a smaller upward inclination than 75 degrees, and all curves and bends are to be deprecated. No flue should be less than 8ins. by 8ins. All unused flue holes in chimneys shall be bricked up, or closed with permanent tightly fitting metal covers. Horizontal brick flues should be covered on their tops with neat cement.

As regards protecting woodwork and other inflammable materials from metal flues, in some places metal shields with air spaces of varying depths on each side will be sufficient; in others a heavy coating of asbestos on the flue and an air space will answer; in other places the woodwork should be protected with asbestos overlaid with tin following all lines and angles.

Tile flues should not be used; these are subject to breakage. Clay pipe flues or chimneys are prohibited.

EXTERNAL DRENCHERS.

We have had occasion to mention the value of external drenchers and have shown an illustration of roof drenchers to Messrs. Jaeger's works. We now give, by the courtesy of the "Sprinkler Bulletin," an illustration showing how certain drenchers actually got into operation at 95, Milton Street, E.C., thereby materially assisting the fire brigade in limiting the spread of fire in adjoining premises.

The fire in question occurred at No. 58, Chiswell Street, the back windows of which are separated from those of the Jaeger Co.'s premises by a distance of 18ft. The fire spread rapidly and the whole of the two top floors of the Chiswell Street property were burnt out, the flames leaping across the small 18ft. space and the heat actually cracking the window glass. The drenchers, however, immediately came into operation, and the flames could make no headway. This incident is particularly interesting at a time when efforts are being made to limit the hazard of vertical openings across courts and narrow thoroughfares. Glazing—and particularly fire resisting glazing—supplemented by drenchers should be of very great value.

The Dundee Fire.—The photographic general view at the top of page 23 of our last "Fire Supplement" was taken by Mr. J. Monkhouse Cartmell, A.M.I.M.E., Glasgow.

EXTERNAL DRENCHERS AT MESSRS. JAEGER'S WORKS, AS A MEANS OF PROTECTION AGAINST A FIRE IN ADJOINING PREMISES.

THE BUILDERS' JOURNAL

AND ARCHITECTURAL ENGINEER.

October 3, 1906. Volume 24, No. 608. 6, Great New Street, Fetter Lane, London, E.C.

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A New Feature. In this issue we give a very fully illustrated article on new buildings in Liverpool—the first of what we hope will be a very useful and interesting series dealing with the chief cities of the Kingdom. There is a considerable amount of good new work in the provinces which has never been illustrated by photographs, and we feel that in this series of articles we shall be covering quite a new field. While referring to new articles in our columns, we may say how pleased we have been to receive such gratifying letters in reference to our series on "The Orders," the second part of which appears in this issue.

Architect and Engineer. FALLACIOUS sayings, dictated either by a desire to make an epigram, or resulting from momentary excitement, sometimes gain considerable public credence. Such remarks do not deserve to be placed on record, but when made by a person of eminence they, unfortunately, too often achieve undeserved notoriety. They may be provocative of thought, but, more often than not, are applauded by the unthinking section of the public. Such remarks can hardly be ignored when constantly repeated. A remark which is reported of Prince Albert has been reiterated by an eminent engineer, evidently with his approval, in a popular book just published. The remark is that Prince Albert used to say that if he wished to *talk* about a thing he would send for an architect, but if he wanted to *do* a thing he would send for an engineer. Obviously, it could be retorted that it would be better if a great many engineers as well as architects talked less and did more. We can easily ignore Prince Albert, but the approval which his remark has received from a well-known engineer, and the fact that this opinion is certainly typical of many members of his profession, as well as the public, renders it desirable to enquire into the chief reasons for such a common opinion. First, perhaps, it reminds us of the disrepute into which the architectural profession brought itself some years ago. This aspect of the subject, however, has often been dealt with, and it is not necessary for us to belabour the dead horse. But another aspect, not only applicable to the architectural profession, but more or less to all the professions, will repay study. Representatives of the working classes have lauded the man who actually does things as being the only useful member of society. In this democratic age they are forgetful that even elementary tribes needed headmen and chieftains to control affairs, to direct labour, and meet their wants in the way of education. The labour advocate might as well look upon the machine as better than its attendant and constructor. The foreman and the labour "boss," crude examples of organisers of labour, are recognised as necessary even by the worker who, because he comes closer in contact with them and understands the part they perform, cannot deny the fundamental logic of their position. The engineer, too, is admitted by the profoundly ignorant because, being a man of science, he is looked upon as a master of the abstruse The architect, together with all those who work in form and facts that are common everyday things of life, is subject to interference, because the public, having that little knowledge which is dangerous, think they could, if it were their choice or opportunity, deal equally well with these realities, forgetful that considerable difficulties underlie the placid surface of common things which the constructive artist has to master. For instance, in planning, everyone thinks himself best competent to judge as to what would be desirable in the way of convenience and accommodation for living or business purposes. Then, again, in regard to decoration and form, the public believe themselves possessed of taste because they have crude likes and dislikes, the result of associations obtained in a narrow life or as a result of reading, travel abroad, and other visionary and fleeting impressions which are difficult to trace. It is strange, though, that the public should ignore as a matter of little or no importance a technical knowledge of construction, or else admit without demur the right of the engineer to this province, merely because he loudly proclaims it and condemns the architect unheard. It is obvious that this assumption of the engineer is entirely unwarrantable, because his profession came into being late in history, whereas the architect was already in possession of the field. By reason of the multitude of details necessary in building operations it is impossible for an architect to be a specialist in every branch. We are now accustomed to call professional specialists engineers, and the specialist seems inclined to sneer at the architect because he does not know so much about the narrow field of work as the specialist himself does; but this is surely expecting too much. As we have often said, it is the architect's controlling hand that brings the workers into their proper relation. We do not ask the admiral to be able to run the engine of a battleship as well as the engineer. We do, however, expect him to be able to understand, and to convey his directions intelligibly to the subordinates—in fact, to *talk* about a thing; and the architect occupies an exactly similar position. Every member of society is necessary in his own particular sphere and the attempt of any one section to laud themselves, and to belittle others, is wrong. The worker and the machine are just as necessary as the professional man, and it is not for us to judge their importance in the ultimate fitness of things, but the part each has to play is clear, and we must all recognise the part of the professional man to be to direct the worker. We all know the position of the architect. There are things he can do which the engineer cannot. Consequently, he should be allowed to exercise his profession without interference from those outside.

PRACTICAL NOTES FOR ARCHITECTURAL DRAUGHTSMEN.

By Alfred W. S. Cross, M.A., F.R.I.B.A. and Alan E. Munby, M.A.

THE ORDERS AND THEIR APPLICATION.

(Continued from p. 136, No. 606.)

Plate II.

The Tuscan Order, though seldom used, is suitable for situations in which an appearance of strength and simplicity is required, and in which the cost of the work is an important factor. It should always be devoid of any enrichment and the unbroken character of the frieze and cornice makes it particularly useful in designs presenting awkward problems of intercolumniation.

The ratio of the dimensions of its parts is exceedingly simple. It should be noticed that the fillet below the cincture of the shaft is included in the height of the base of this Order. The projection of the cornice over the upper circumference of the column is, in this and in all Orders, except the Doric, equal to its height.

The Doric Order is always effective when used in lower storeys, arcades, and door and window openings, but owing to the triglyphs upon the frieze, which must fall centrally over the columns, it is the most difficult to deal with when spacing is in question.

The dimensions of the cornice do not lend themselves to any simple ratio and its projection is always greater than that adopted for the other Orders. The 45° line from the top of the frieze at once gives the bed mould of the mutule course, and one-third of the height of the cornice added to the top projection of this guiding line gives the total projection, while the mutules are one-half a diameter in side elevation. Some considerable modifications of the Order, as here represented, will be found to exist in many recognised examples. Occasionally the mutules are dispensed with, and their bed mould is cut to form a dentil course, as in the Theatre of Marcellus. The cyma crowning the cornice is often replaced by a cavetto, while the Doric base (shown alternatively on the plate) sometimes replaces the more graceful attic base. When this base is used, the upper fillet should be included in the height of the shaft, as in the Tuscan Order.

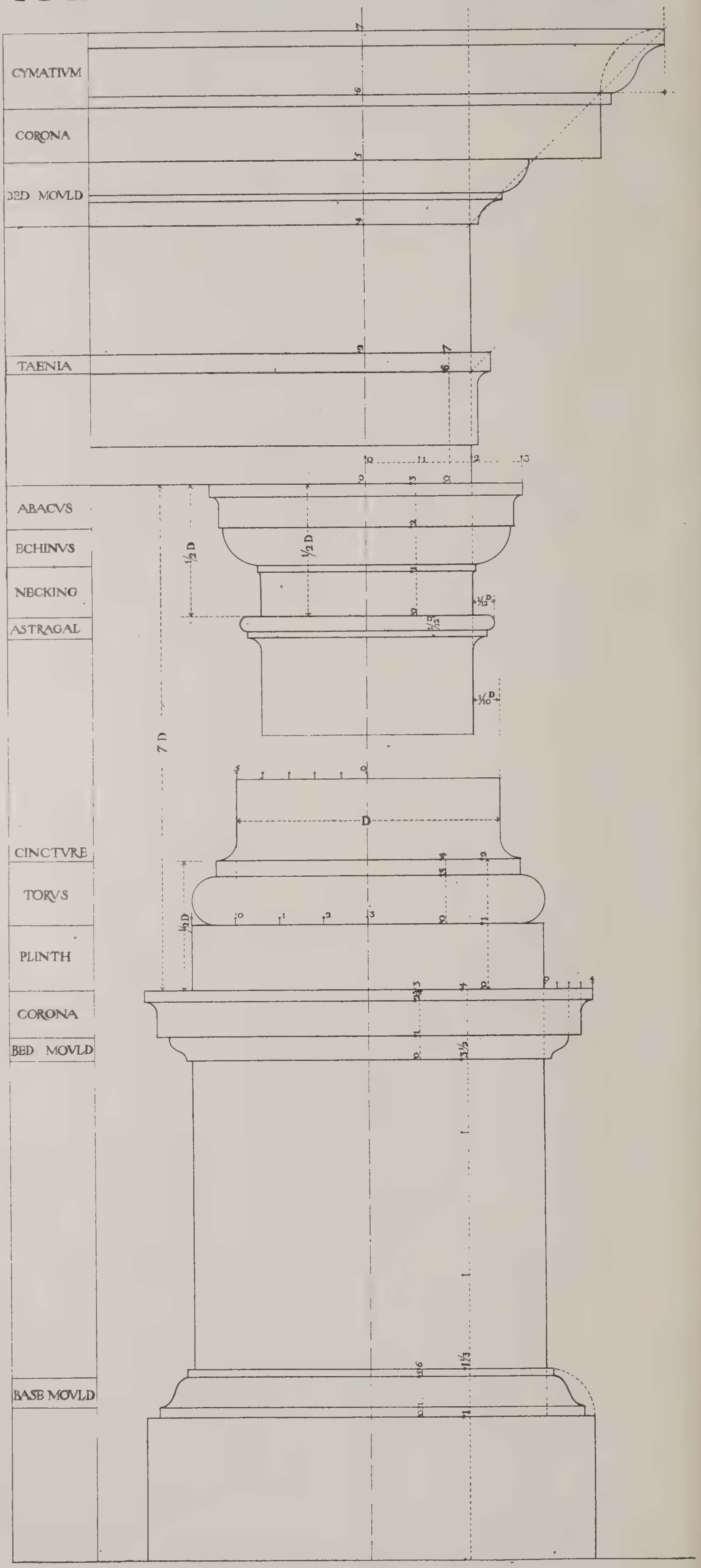
Plate III.

The Ionic Order shows smaller variations from the pure Classic examples than any other, and its proportions are fairly simple.

Two styles of cornice are, however, used, the modillion and the dentil cornice, and although the method adopted by Gibbs of giving prominence to the former has been followed, it should be stated that the latter is more generally found in old examples, whilst the former is preferred by Palladio.

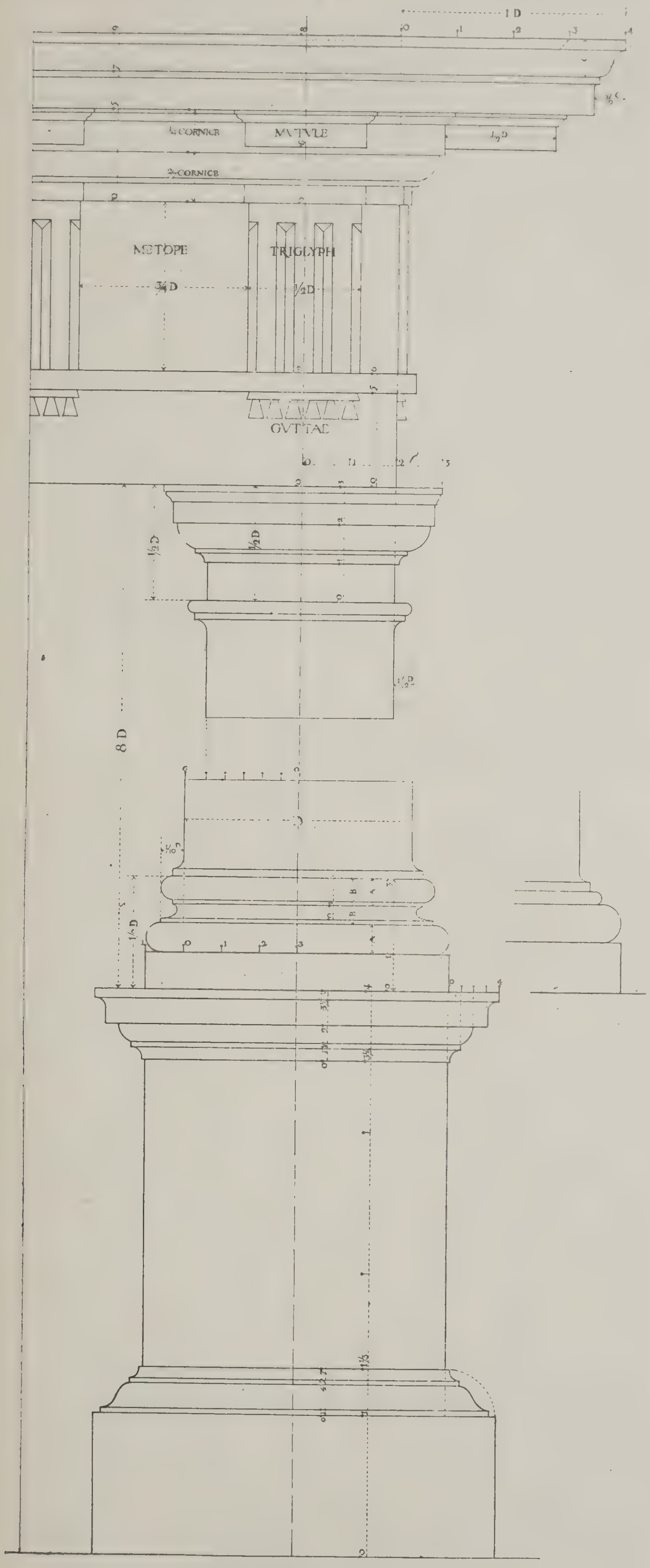
Represented side by side upon the plate the extent of the variation is easily discernible. A modillion or dentil should always be bisected by the centre line of the column and the spacing determined by the distance of this line from the frieze, as set out upon the drawing. The frieze is always plain and in larger works it is, preferably, kept flat. In smaller com-

THE ORDERS IN DETAIL



TVSCAN

PLATE: 2.



DORIC

positions, however, when narrow or when used over doors and windows a pulvinated frieze may be adopted with good effect.

The earlier alternative form of the Ionic capital in which the faces of the volutes are parallel to the plane of the elevation (not shown upon the drawings) may, of course, be substituted for the capital with angle volutes at 45°, though the latter has usually a much more graceful effect, particularly in small compositions. Of course, the geometrical method for setting out the volutes cannot be used in drawing such capitals in ordinary elevation. It should be noticed that the height of the capital in this Order is measured from the soffit of the volutes.

The centre of the eye is one-third of the height of the capital from its bottom and is in elevation placed just outside the top circumference of the shaft, while the horizontal fillet at the top of the shaft is immediately below the eye.

When the column is fluted the width of the fillets should be one-fourth to one-third that of the flutes. The flutes generally number twenty or twenty-four; in the latter case the simple method of setting them out on plan, as shown on the drawing, will be found of service.

The attic base is always used with the Ionic Order.

The Corinthian Order has been represented with considerable variations from the original type.

The Ionic entablature was often used by the ancients, supported by Corinthian columns, and the Corinthian cornice itself, though here represented with a dentil band, is often found without one. No general rule appears to exist for spacing the modillions or for their dimensions, the ratio of the width of the modillion to the space between two of them varying from 1 : 1½ to 1 : 2½, and again the number of the dentils between the modillions varies from 2 to 5 in different examples.

Both features should be symmetrically placed with reference to one another and to the centre line of the column, a point often neglected. To secure this result the following method is recommended:—Draw a modillion one-sixth of the diameter of the column in width, arranged symmetrically over the centre line of the column. Place another with its outside edge three and a-half times its width within the total projection of the cornice, and thus obtain the spacing between the blocks. Divide the distance between two modillion centres into 15 parts, give two to a dentil, to be placed symmetrically under a modillion, and one to each space between the dentils, which will be found to bring the inside edge of the last dentil before the return, on the frieze line.

The form and projection of the leaves of the capital are largely matters of individual taste, but the general method of their arrangement will be evident after examining the drawing. It may, however, be noted that the eye of the volute is just outside the lower circumference of the shaft, and that the tiers of leaves divide the capital below the abacus into three approximately equal horizontal sections.

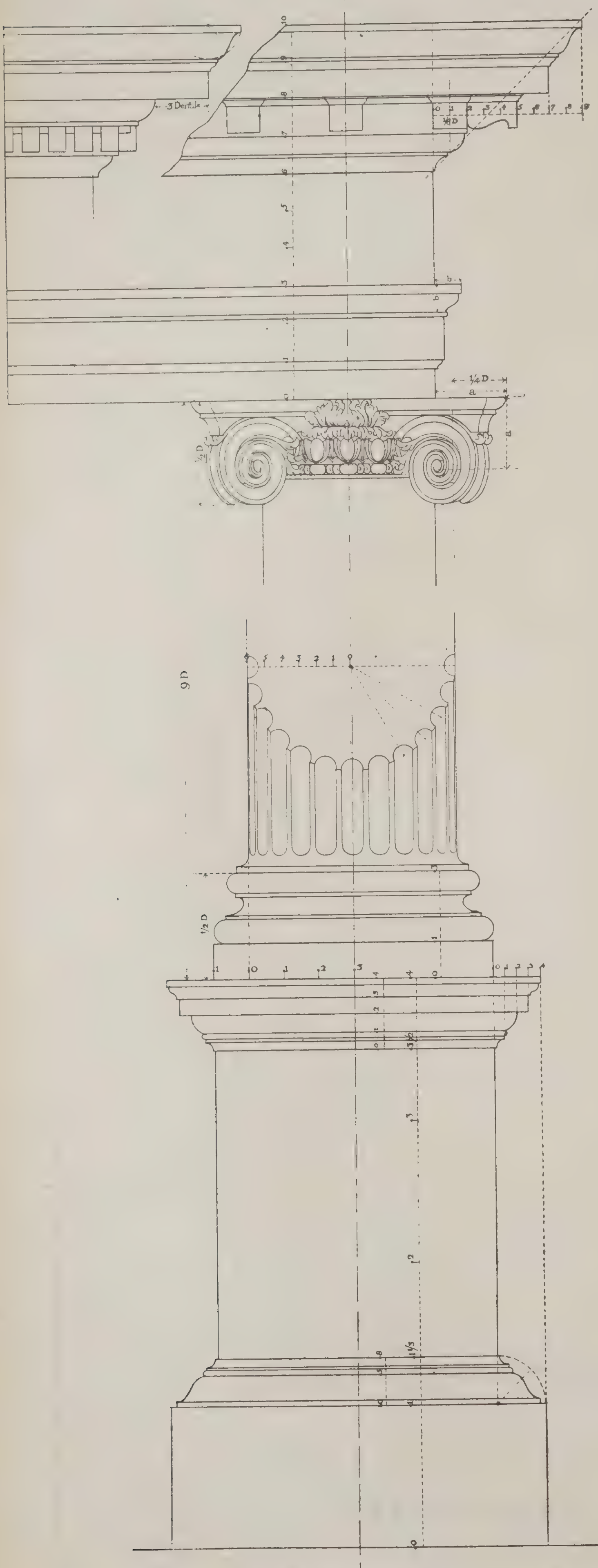
The column may or may not be fluted as in the Ionic Order.

The attic base, as used in the Ionic Order, is very generally employed—in fact it is often preferable to adopt it, omitting the additional mouldings shown, for the sake of variety, on the drawing.

(To be continued.)

THE ORDERS IN DETAIL

PLATE. 3.



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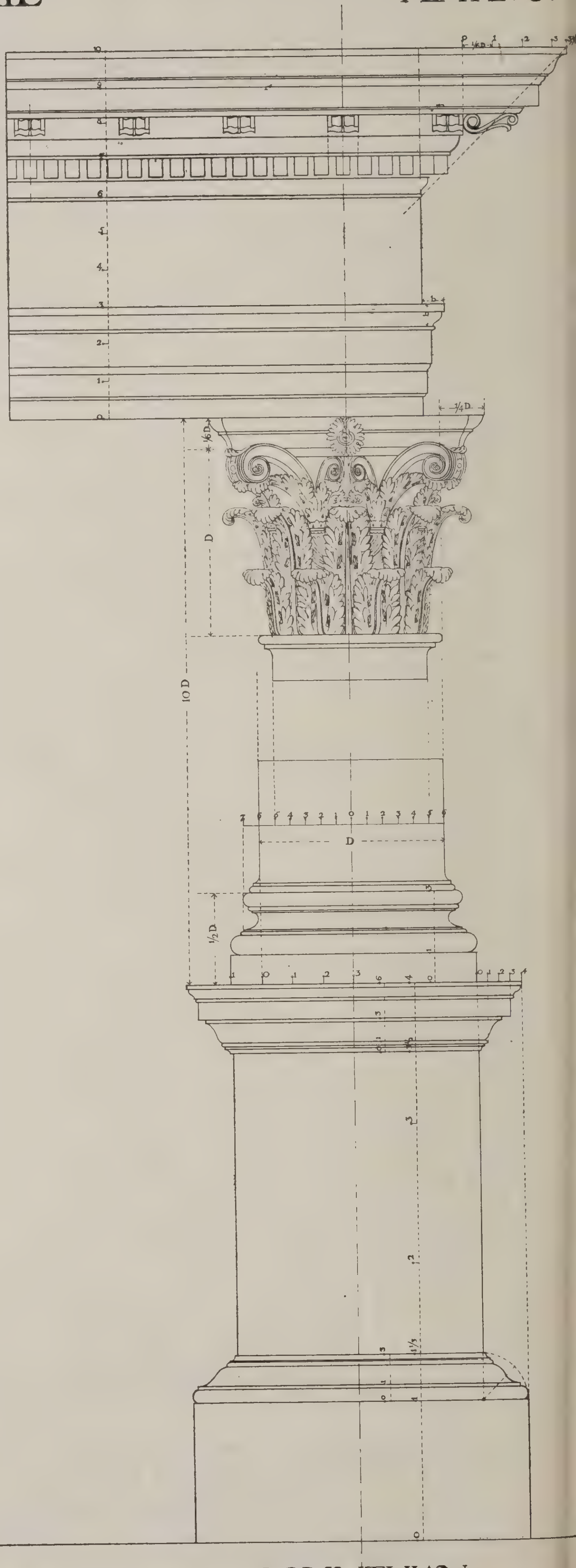


CORINTHIAN

Views and Reviews.

Historic Ornament.

The character of this book, which has now deservedly arrived at a second edition, is accurately conveyed by the title. It has been considerably extended since the first edition, especially in the direction of architectural ornament. The book mostly consists of plates drawn by the author from examples of decorative detail, but general mass composition and planning in architecture are also dealt with. To the architect these two latter branches are of much interest, but the book is devoted to ornament and we cannot expect it to depart from its particular purpose. Together with the plates there are notes giving an historical summary of the derivation of the various ornamental forms, and incidental reference is made to some of the causes which led to their coming into being. The book does not deal with the anatomy and æsthetic laws of decoration, nor with the technique incidental to the special branches of work which have been the causal functions of types of decoration, *e.g.*, the influence of position and purpose, climate, material, and durability in the ornament of architecture, sculpture, furniture, textile fabrics and printing. Information is provided by Mr. Glazier which would be sufficient for a most enlightening critical treatment of the subject on such lines, and we wish that the author had gone out of his way to thus deal with the subject, however sketchily, for by so doing students would have been given a glimpse of the relation of the form to the determining causes, so that he would not be led to copy the decorations suited to one material, to one age, and to one country, in other materials, at the present day, and in other countries. Forms derived by thus working in one branch may be suggestive to workers in other branches, but there has never been in real living decoration anything in the nature of copyism, and the publication of such manuals as this has, in the past, tended more to produce copyism than to advance original thought; consequently, while we are willing to admit that this book is excellent as far as it goes, we could wish that the author had broadened its purview so as to direct the student (for whom the book is primarily intended) to the right road.

"A Manual of Historic Ornament," by Richard Glazier, Hon. Associate Royal College of Art, A.R.I.B A., headmaster of Municipal School of Art, Manchester. Second Edition. London: B. T. Batsford, 94, High Holborn, W.C Price 6s. nett.

Three Books Published Serially.

Not long ago we reviewed in volume form Prof. Adams's "Building Construction," which had been published originally by Messrs. Cassell & Co. in twenty-four weekly parts, a system apparently popular, for the publishers, in addition to now reissuing this book, have adopted the serial system with two further works, namely, "Engineers' Handbook" (also written by Prof. Adams) and "Carpentry and Joinery." The former promises to be a most valuable work. Under a slightly different title it has already passed through four previous editions, but has now been thoroughly revised and partly re-written in order to bring it up to date. It is intended to contain a series of memoranda such as we are accustomed to find in the class of publication generally called "a pocket book." It is, however, somewhat different to the ordinary "engineer's pocket book," for which Molesworth sets a very high standard, in so far that it endeavours to explain the derivation of formulæ; in fact it stands between the formula-book and the text-book, and may be rightly called an *aide-memoire.* It compares perhaps more with the two well-known American pocket books, Kidder's for architects, and Trautwine's for engineers, or with the German "Hütte des Ingenieurs Taschenbuch." The first part before us deals with the fundamental principles of engineering, and defines such terms as force, matter and motion, chemical laws and physical properties of matter, Newton's laws of motion and units of work and energy. The definitions consist mostly of quotations from authorities to whom reference is made. These quotations are very pointed and clear. The work undoubtedly deserves to be purchased by everyone in the architectural and engineering professions. The first part of the text-book on "Carpentry and Joinery" also holds out promise of being an excellent work when completed. It commences with a description of hand-tools and appliances, well illustrated by photographs from actual tools. A coloured plate is included illustrating the construction of a circular-headed casement window. This, however, is entirely out of place—an obvious fault to which we referred in reviewing the bound volume of Prof. Adams's "Building Construction." In future parts it would be well if the coloured plates were inserted in their proper position in the text.

"Engineers' Handbook, comprising Facts and Formulæ, Principles and Practice," by Prof. Henry Adams, M.Inst.C.E., M.I.Mech.E.
"Carpentry and Joinery," edited by Paul N. Hasluck.
"Building Construction," by Prof. Henry Adams.
(Each published in 24 weekly parts, price 3d. eachnett).
London: Cassell & Co., Ltd.

Enquiries Answered.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional, or legal matters.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Fees for Surveying.

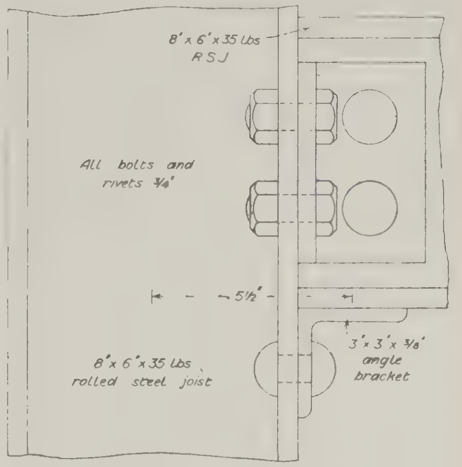
CURIOUS writes: "How should I make out a bill of costs for surveying several farms?"

See "Specification No. 9," price 2s. 6d. nett or 3s. 3d. post free from our offices.

Stanchion with Side Load.

YORKS.—R. F. writes: "Please show how to calculate the size of a rolled steel joist to act as a stanchion 15′ 0″ high, carrying 20 tons at one side on a 3″ bracket riveted to a flange at the top of the stanchion. Kindly give detailed sketch of bracket."

More information should have been given about the circumstances of the case—in fact, full particulars are necessary before any reliable answer can be prepared. Assuming that there is no other load upon the stanchion, and that it is so placed as to be unable to bend in the plane of the flanges, try a British Standard beam (B.S.B. 14) 8ins. by 6ins. by 35lbs. By the Rankine-Gordon formula, as used by the Cambria Steel Co., $\frac{\mathrm{FS}}{1+\frac{1}{a}\left(\frac{l}{\mathrm{T}}\right)^2}=\frac{50{,}000\times10{\cdot}29}{1+\frac{1}{36{,}000}\frac{(15\times12)^2}{10{\cdot}8}}=475{,}000$lbs. ultimate load. Allow a factor of safety of 4, then safe load $=\frac{475{,}000}{4}=119{,}000$lbs. = say, 53 tons, and $\frac{53}{10{\cdot}29}=$ say, 5 tons maximum safe working load per sq. in. Then the bracket being as in the accompanying figure, the maximum stress will be $\frac{\mathrm{W}}{\mathrm{A}}\pm\frac{\mathrm{M}}{\mathrm{Z}}=\frac{20}{10{\cdot}29}+\frac{20\times5{\cdot}5}{28}=2+4=6$ tons per sq. in., showing that the section is not quite large enough; but it would be waste of space to go further here, as the conditions are so indefinite.



Moment of Inertia of Trough Beam.

LLEWELLYN writes: "I send sections (not reproduced) of a trough. I tried to calculate the moment of inertia by using Molesworth's and Hurst's formulæ, but the results are very different. Where does the error lie? My object in working out the moment of inertia is to determine the moment of resistance given in Dorman, Long & Co.'s book—namely, 135·80. M.R. in inch tons 882·70, breaking pressure 28 to 32 tons per sq. in., and working pressure $6\frac{1}{2}$ tons per sq. in. Again, assuming the moment of inertia to be the same, I find that Molesworth's rule for obtaining $\mathrm{M.R.}=\frac{6\mathrm{KI}}{\mathrm{N}}$ or $\mathrm{M.R.}=\frac{\mathrm{MI}}{\mathrm{N}}$ and Dorman, Long & Co.'s rule $\mathrm{R}=\frac{\mathrm{I}}{n}$. The I and n in each case stand for the same quantities, and therefore I cannot see how the result can be made the same in each case."

Section modulus $z=\frac{\mathrm{I}}{y}$, where I equal moment of inertia and y = the distance from neutral axis to edge of section. Applied to the present case, $z=135{\cdot}8$ as given in Dorman, Long & Co's catalogue and $y=6{\cdot}5$, then $\mathrm{I}=zy=135{\cdot}8\times6{\cdot}5=882{\cdot}7$. By Hurst's approximate rule the result is bound to be less than the true figure; as shown it equals 844·04, but there are errors in the calculation; correcting these the result is 864·26. By Molesworth's method $\mathrm{I}=\mathrm{A}a=38{\cdot}0\times23{\cdot}48=892{\cdot}24$. In finding the area of the "inertia area" the scale must be allowed for; if drawn 2ins. to 1in. (half size) the actual result must be multiplied by $2^2=4$. In the working submitted for this method one side of the trough has been omitted. More care is necessary.

HENRY ADAMS.

Treads for Stairs.

PADIHAM.—CONSTANT READER writes: "What do you consider the best material for fixing on wood stairs in order to preserve same? The stairs are in a club where clogs are worn as well as boots. At the present time we have a combination of lead and some other hard material, but the members' clogs makes a loud noise on it."

We suggest the use of Gooding's patent interchangeable rubber stair treads, the wearing surface of which consists of india-rubber squares set in a metal frame. These squares can be renewed when worn. They are sold by Mr. William Gooding, of North Road Works, Holloway, N.

Entering Borough Surveyor's Office.

LONDON.—A. H. L. writes: "How should I set about entering a borough surveyor's or a borough engineer's office? What are the conditions of employment? How does one qualify as a borough surveyor or borough engineer?"

Get "How to Become a Municipal Engineer," by J. Freebairn Stow (price 1s. nett, from our offices).

Claim in Respect of Drain.

LONDON.—R. T. F. writes: "A friend of mine purchased a new house and had not been in occupation long before his boy was stricken with diphtheria. The child had this three times, and it was found at last to have been caused by an old disused drain. Who was to blame, and can compensation be claimed?"

We cannot express a definite opinion without much fuller details, and, therefore, recommend you to consult a solicitor.

Concrete Block Cottages Roughcast.

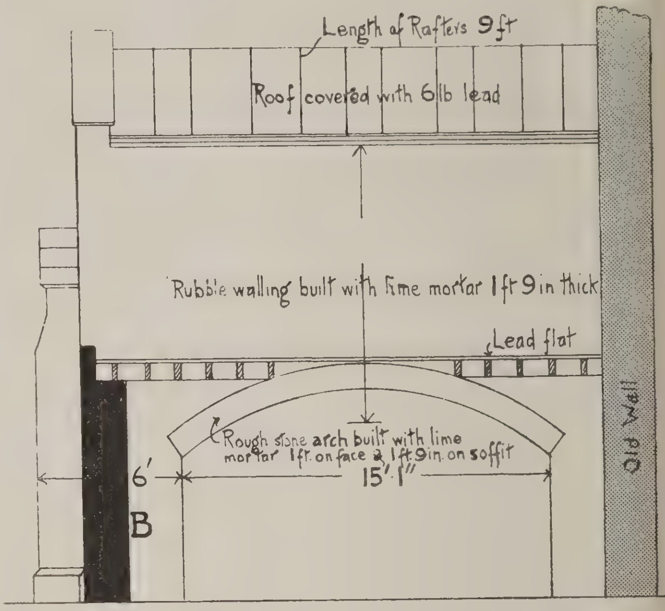
S. F. writes:—"(1.) Would concrete blocks covered with roughcast be suitable for a labourer's cottage near the sea? (2.) Must cement concrete be used, or would lias lime serve the purpose? (3.) What size is most convenient for the blocks? (4.) Would the cost be less than if using bricks and roughcast?"

(1.) Yes, especially if made hollow and plastered inside. (2.) Portland cement should be used. (3.) It depends upon appearance, and whether a machine with standardised moulds is used, or whether the blocks are moulded in wooden boxes without the use of machinery. In any case the blocks should be made of regular sizes so as to bond with each other, and it is more economical to adopt a size which can be easily handled by a man without the use of lifting appliances. (4.) It depends upon the cost of bricks at the nearest brickworks and the cost of carriage. If the bricks cost more than 20s. on the site, it would probably be cheaper to use concrete blocks, but it depends a good deal on the knowledge of the builder and control of the workmen, and without experience in concrete blocks it would probably be cheaper to use bricks for one cottage.

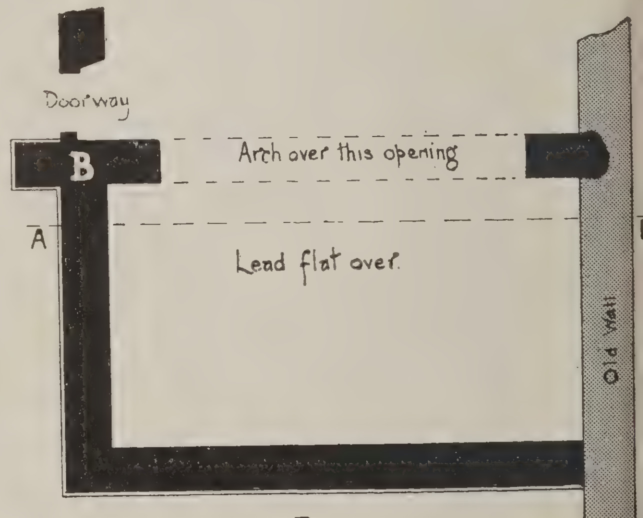
Book on School Buildings.

LONDON.—H.C.P. writes: "Please recommend book on school construction and design, with information on air-space, height of rooms, windows, &c.?"

"Modern School Buildings," by Felix Clay (price 25s., post free, from our offices).


Length of Rafters 9ft
Roof covered with 6lb lead
Rubble walling built with lime mortar 1ft 9in thick
Lead flat
Rough stone arch built with lime mortar 1ft. on face & 1ft 9in. on soffit
6'
15' 1"
B
Old Wall

SECTION ON A-B



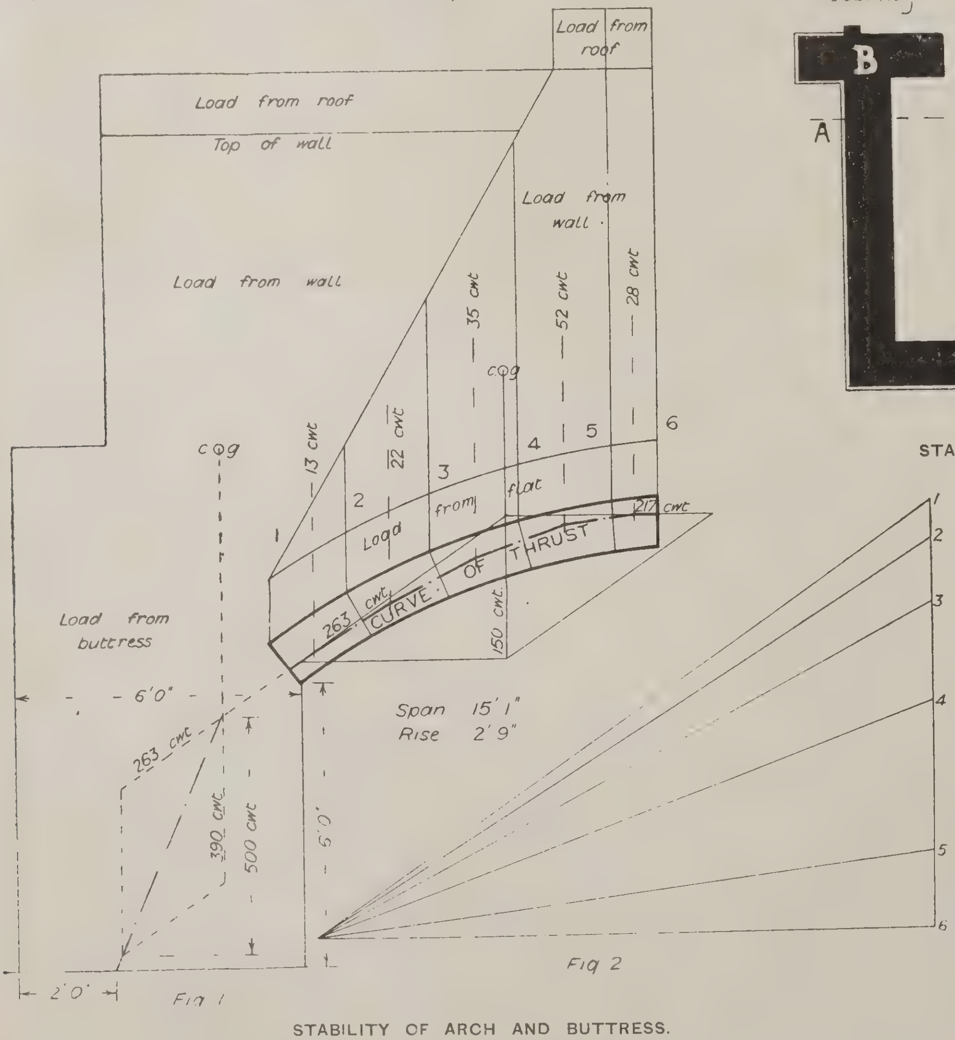
PLAN

STABILITY OF ARCH AND BUTTRESS.

Stability of Arch and Buttress.

YORKS.—G. W. B. writes: "The accompanying sketch shows an addition to a small parish church which we are at present erecting. I am doubtful whether the arch is safe, and, in particular, whether the abutment marked B on plan and section is strong enough to take the thrust. Please express your opinion on the construction proposed, and also inform me of the name of any work I can refer to on the subject."

Figs. 1 and 2 show the method of calculating the thrust upon the arch. It will be seen that the pier B is not strong enough, and its dimensions should be increased. The pressure in the arch is considerable, and it would be advisable to use a hard stone set in Portland cement mortar. As regards a book of reference, we suggest Rivington's "Notes on Building Construction," Vol. IV.



STABILITY OF ARCH AND BUTTRESS.

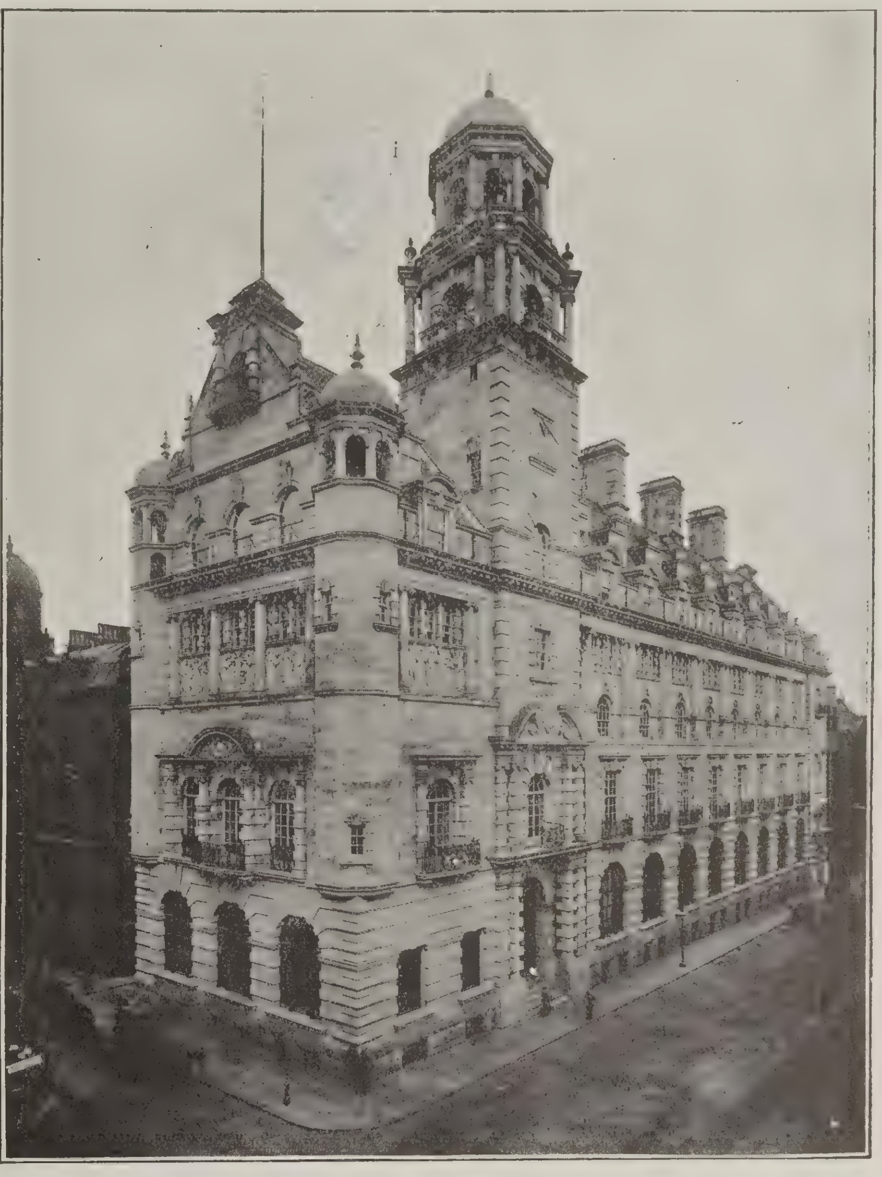
NEW BUILDINGS IN LIVERPOOL.

LIVERPOOL is pre-eminently a modern business city; indeed, it is said to be perhaps the most go-ahead city in the country. The facilities for getting about it are certainly very complete, Liverpool having been first in the United Kingdom to provide a municipal tramway service with electric cars, while the ferries across the Mersey to Birkenhead and other growing districts are also excellent.

When speaking of the buildings of Liverpool, one has perforce to give premier place to St. George's Hall—that splendid work of a young English architect, Elmes, carried to completion with scholarly ability by Cockerell, after the architect's death. But Liverpool has many other notable buildings, the majority of which are to be found within the small area which forms the chief business centre. Here is to be seen much work of conspicuous merit, and architects in other parts of the country would find it worth while to see it for themselves. From London there is, of course, the very admirable service of the London & North Western Railway, which puts Liverpool within a little over three hours and a half of the metropolis.

The purpose of this present article is to show the most important new structures which have been erected in Liverpool, and we have had to make a definite distinction between what may properly be called new, and what is of yesterday. Such buildings as St. George's Hall, the old Town Hall, the Exchange, the Municipal Offices, the Museum and the Walker Art Gallery are quite outside the scope of this article, as also are the Post Office (completed in 1894 from Sir Henry Tanner's designs), Mr. Mountford's fine block of the technical schools, completed in 1900, and Mr. Norman Shaw's two buildings—the White Star offices, fondly reminiscent of New Scotland Yard (Mr. J. Francis Doyle was joint architect with Mr. Shaw for this building), and Parr's Bank in Castle Street, for which Messrs. Willink & Thicknesse were joint architects with Mr. Shaw.

VIEW DOWN DALE STREET.

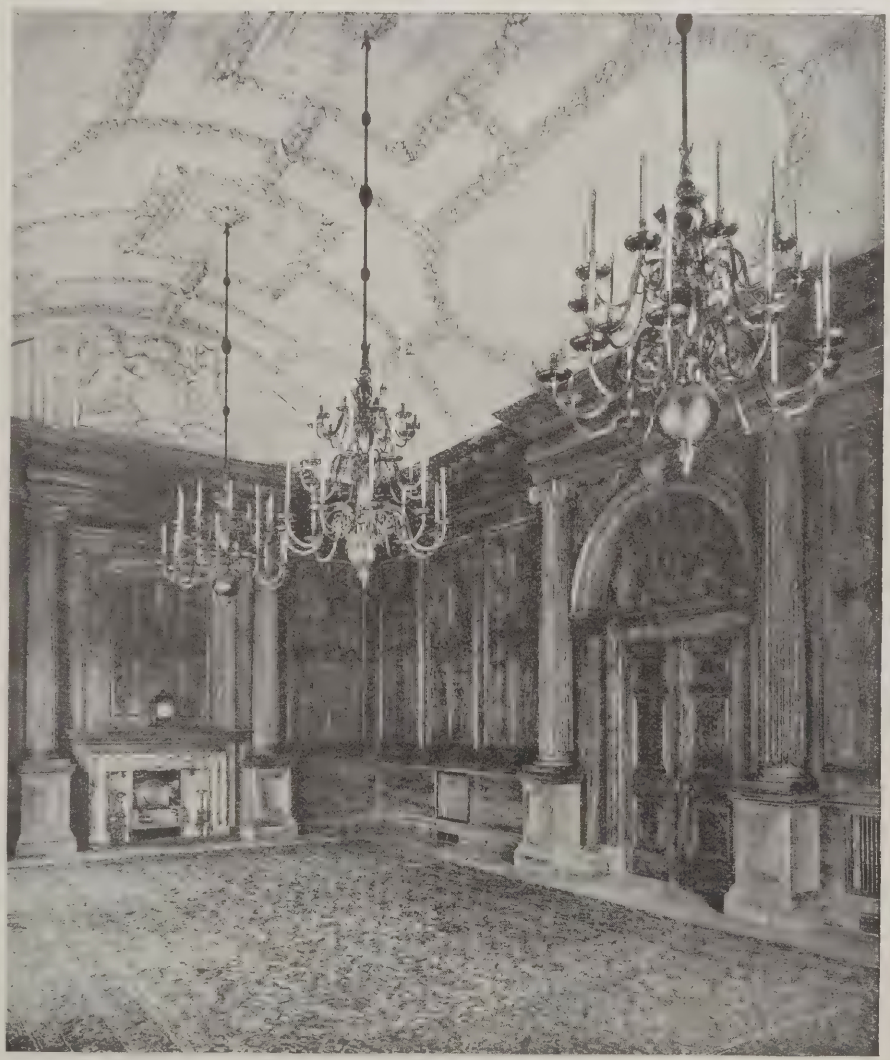


ROYAL INSURANCE BUILDING, DALE STREET. J. FRANCIS DOYLE, F.R.I.B.A., ARCHITECT, R. NORMAN SHAW, R.A., ADVISORY ARCHITECT.

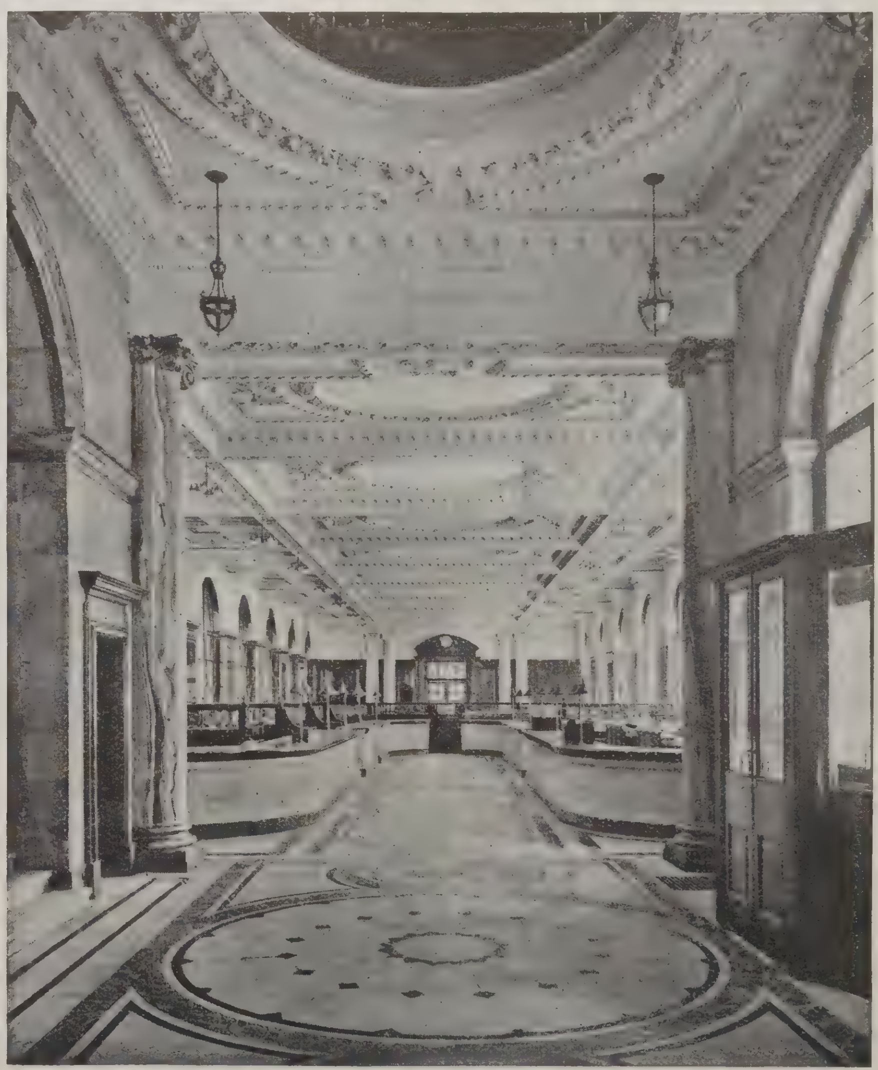
The Royal Insurance Building.

As a starting point we have taken the huge block of the Royal Insurance Co. erected at the corner of Dale Street and North John Street from the designs of Mr. J. Francis Doyle, of Liverpool, with whom was associated Mr. Norman Shaw as "advisory architect." This replaces a former building of the Insurance Company on the same site, built at the beginning of the 19th century. Carried out in Portland stone it masses up well, more especially from North John Street, where the colonnade on the second and third floors is particularly effective; the balconies, too, are very good. The tower of the building does not strike us as being so successful as other parts. It would, we think, have been better to have omitted the lower stage altogether, and carried up the tower solid. The cupola is gilded, adding a lively piece of colour to the building.

The sculpture frieze running across the upper part of the Dale Street front, and on the return to North John Street, was executed by Mr. C. J. Allen, under Mr. Doyle's direction, and represents Insurance in alliance with Commerce, Science and Art. The frontage to North John Street is over 215ft., and to Dale Street 55ft., the height to the ridge of the roof being 110ft., and to the top of the cupola 160ft. Within the building there are many fine rooms. The chief of these is the general office on the ground floor, which has a very elaborate plaster ceiling with rich panelling round the walls, and marble and mosaic in profusion. There is no column to break up the general floor space, deep girders having been carried across from wall to wall and trusses put in above. Marble has been extensively used for the staircases, and windows are filled with stained glass; consequently the building has an air of extreme richness. Of the various rooms on the upper floors the finest is the board-room, 44ft. by 24ft. 6ins. by 27ft. 6ins. high. The ceiling here is barrel vaulted and embellished with fine plaster work, while the walls, for a height of 19ft., are panelled with magnificent walnut. The panelling is quite plain, and, by contrast, the pillared doorway and fireplace have an imposing effect. The firegrate is

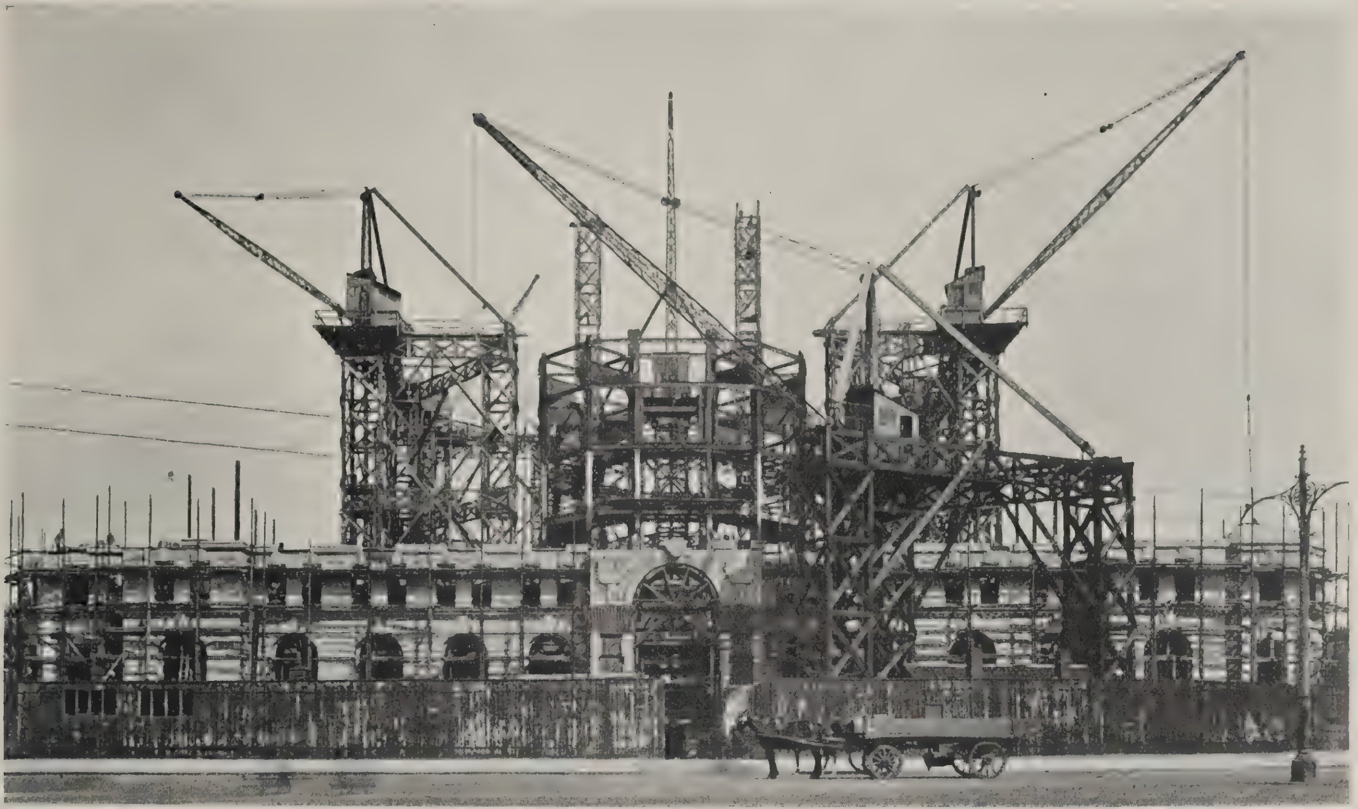


The Board Room.



The General Office.

ROYAL INSURANCE BUILDING, DALE STREET, LIVERPOOL. J. FRANCIS DOYLE, F.R.I.B.A., ARCHITECT.

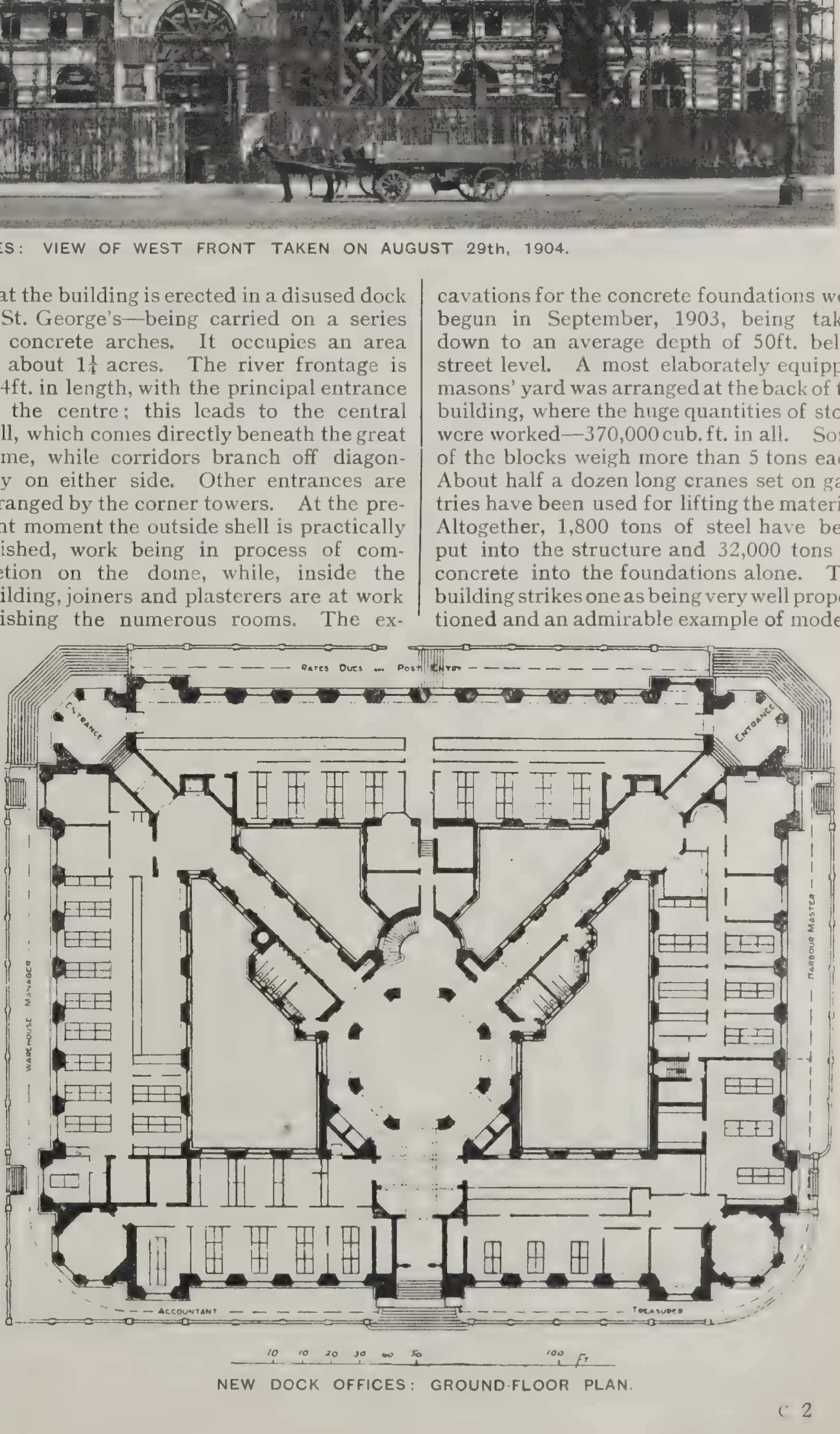


NEW DOCK OFFICES: VIEW OF WEST FRONT TAKEN ON AUGUST 29th, 1904.

interesting as being the work of Alfred Stevens, while the three chandeliers are antique, having been made in Utrecht in 1647 and 1649. This building of the Royal Insurance Co. was commenced in 1897 and partly occupied in 1900, but it was not until June, 1903, that the directors used their new board-room.

The New Dock Offices.

Since that date many important works have been carried out in Liverpool, several large buildings being now in process of erection. Undoubtedly the most important is the great block of offices for the Mersey Docks and Harbour Board. This is the outcome of a limited competition in which Messrs. Briggs & Wolstenholme, F. B. Hobbs & Arnold Thornely were the successful architects. In the majority of cases, owing to the necessarily high cost of land, large city buildings are unfortunately not set on such sites that the general effect can be adequately seen. In London, for example, there is the case of the Law Courts in the Strand, and the more recent case of Westminster Cathedral, both of which buildings are on sites inadequate for the best architectural effect. With the new Dock Offices at Liverpool, however, the case is different, for this great block occupies an open site facing the Mersey and can be seen all round to the best advantage. The plan of the building is, roughly, a square, with a huge dome set in the centre, and towers at each corner. The building is partially of steel construction, and in most instances the steel has been encased in concrete. The facades are carried out in Portland stone, with the exception of the ground-floor portion of the north-east and south-east angle towers, which portion is of granite from the Dock Board's quarry at Kirkmabreck, in the South of Scotland; as also the boundary wall surrounding the building. The great centre dome is 74ft. in diameter at the base, and the top of its cupola is 223ft. from pavement level. It is interesting to note that the building is erected in a disused dock—St. George's—being carried on a series of concrete arches. It occupies an area of about 1¼ acres. The river frontage is 264ft. in length, with the principal entrance in the centre; this leads to the central hall, which comes directly beneath the great dome, while corridors branch off diagonally on either side. Other entrances are arranged by the corner towers. At the present moment the outside shell is practically finished, work being in process of completion on the dome, while, inside the building, joiners and plasterers are at work finishing the numerous rooms. The excavations for the concrete foundations were begun in September, 1903, being taken down to an average depth of 50ft. below street level. A most elaborately equipped masons' yard was arranged at the back of the building, where the huge quantities of stone were worked—370,000 cub. ft. in all. Some of the blocks weigh more than 5 tons each. About half a dozen long cranes set on gantries have been used for lifting the material. Altogether, 1,800 tons of steel have been put into the structure and 32,000 tons of concrete into the foundations alone. The building strikes one as being very well proportioned and an admirable example of modern

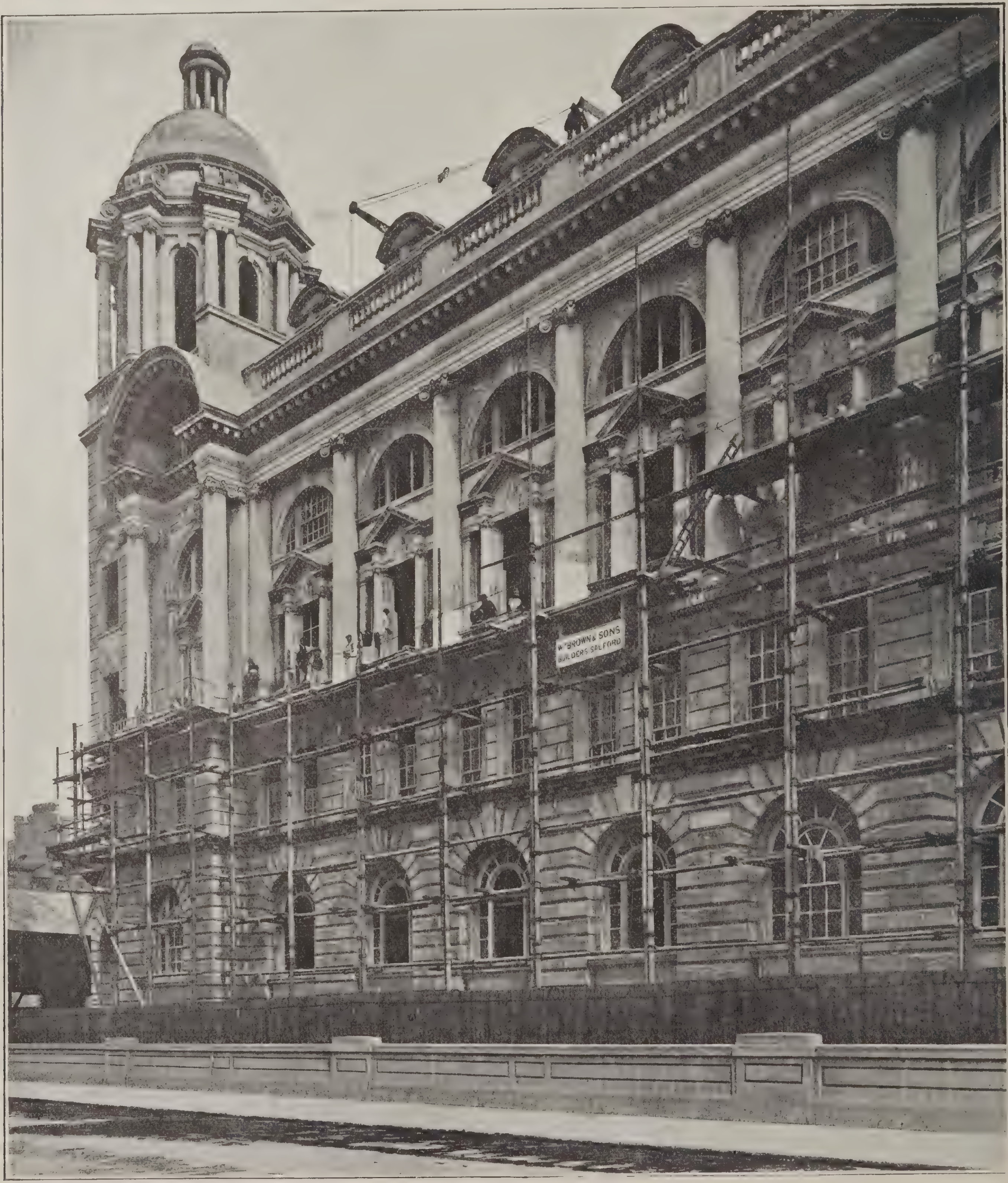


NEW DOCK OFFICES: GROUND-FLOOR PLAN.

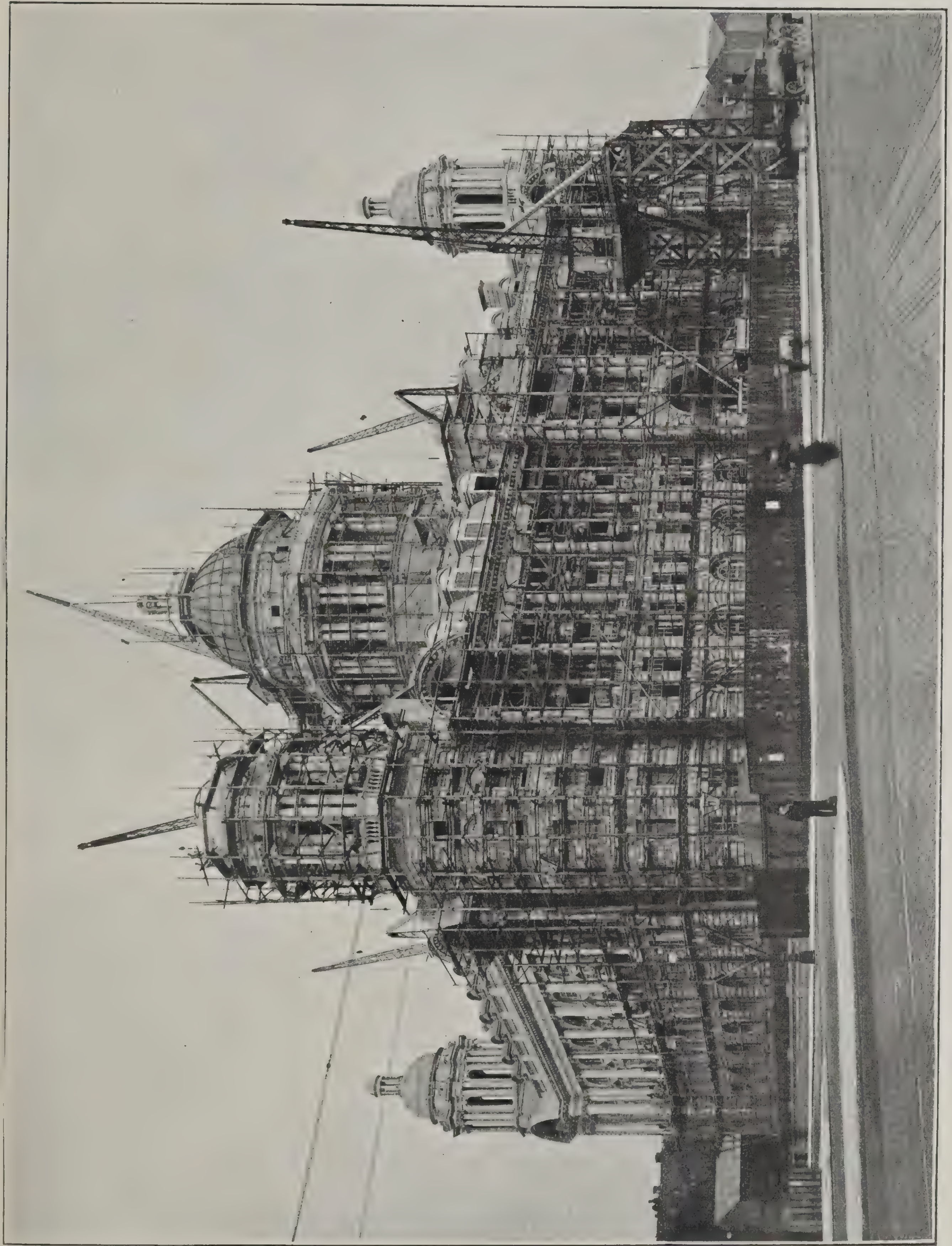
English Renaissance. In point of size it is not quite so large as the new War Office in London, but in monumental effect it far excels the latter. The design of corner towers is always a matter of particular difficulty, but in these new dock offices we think the architects have been very successful. The contract for the building was entrusted to Messrs. William Brown & Sons, of Trafford Road, Salford, Manchester, who have executed the work in a most creditable manner. The sub-contractors, who have given every satisfaction, are :—

Slating, plastering, and fibrous work, Messrs. Waterhouse & Dondy, Liverpool; *plumbing, glazing, and sanitary fittings*, Messrs. Mellowes & Co., Sheffield; *boilers, heating, and ventilation*, Messrs. Ashwell & Nesbit, Ltd., Leicester; *stone carving*, Messrs. Earp, Hobbs & Miller, Messrs. Norbury & Co. and Mr. E. O. Griffiths; *sculpture work*, Mr. C. J. Allen, Liverpool; *marble work*, Messrs. John Stubbs & Sons, Liverpool; *terrazzo floors*, Messrs. Diespeker, Ltd., London; *metal casements, leaded lights, railings and gates*, Messrs. George Wragge, Ltd., Salford; *wood-block flooring*, Messrs. Roger Lowe & Co., Ltd., Farnworth, Bolton; *copper dome*, Messrs. Ewart & Sons, London.

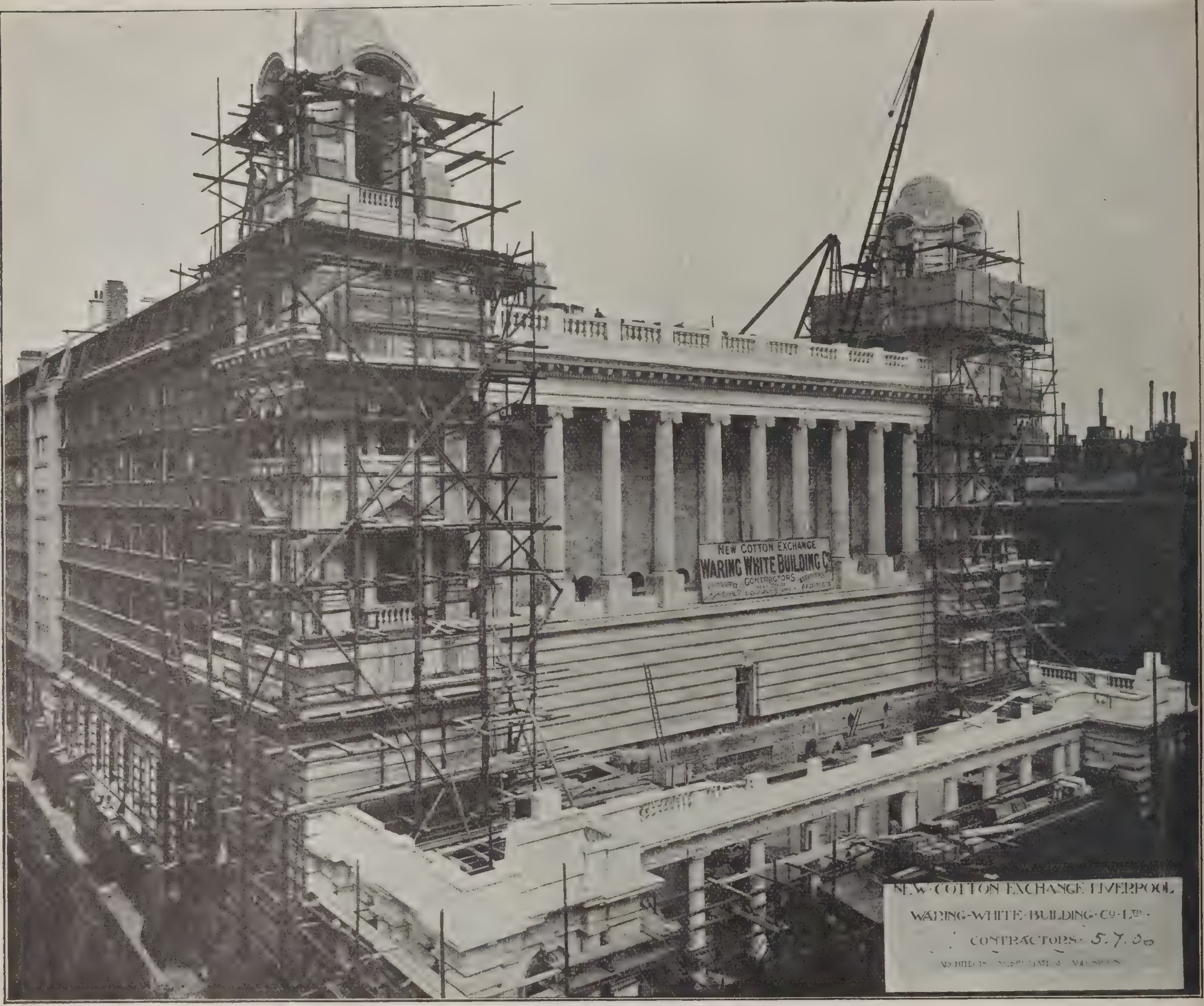
The whole of the work has been carried out under the direct supervision of Mr. W. S. Latta, clerk of works. It is expected that the contract will be all completed by the end of this year—three months within the stipulated time—a speed record for a building of such immense proportions and classical design. The cost, including fittings, will be about £300,000. The basement of the building is occupied by store rooms; the ground floor with offices for the treasurer, rates and dues, &c.; the first floor with the general office and statistical department; the second floor with offices for the manager, solicitor, &c., as well as the board-room (which is panelled out in mahogany); the third floor with departmental offices and members' dining-room, &c.; and the top floor with rooms for the caretaker.



NEW OFFICES FOR THE MERSEY DOCKS AND HARBOUR BOARD: PORTION OF NORTH FRONT AND CORNER TOWER.
BRIGGS & WOLSTENHOLME, F. B. HOBBS & ARNOLD THORNELY, ARCHITECTS.



NEW OFFICES FOR THE MERSEY DOCKS AND HARBOUR BOARD.
BRIGGS & WOLSTENHOLME, F. B. HOBBS AND ARNOLD THORNELY, ARCHITECTS.



MATEAR AND SIMON, FF.R.I.B.A., ARCHITECTS.

Adjacent to the new dock offices it was proposed that new baths and tramway offices should be erected, and about three years ago the Corporation held a competition, the first premium being awarded to Messrs. Stones & Stones, of Blackburn, and Mr. W. Edwardes Sproat, of Liverpool, joint architects. This competition, however, was a fiasco, because it was decided later to abandon the scheme, the Baths Committee and the Tramways Committee each to submit a scheme of their own for the dock site "or elsewhere." New baths will certainly have to be built, as the present baths are unsatisfactory, and have to be closed within a year. So far as the George's Dock site goes, however, the latest news is that the Royal Liver Friendly Society has acquired the northern portion of it, between Water Street continuation and St. Nicholas's Place, and will there erect new offices. £70,000 is given as the cost of the site, while £300,000 is spoken of as the cost of the building.

The New Cotton Exchange.

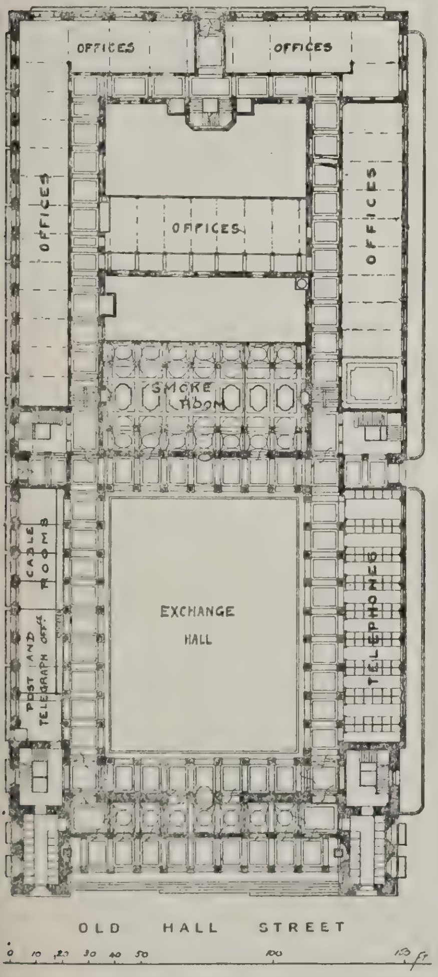
The next most important new building in Liverpool is the new Cotton Exchange—in course of erection in Old Hall Street. The architects of this building are Messrs. Matear & Simon, FF.R.I.B.A., of Liverpool, whose design was selected in competition in 1904. The contractors are Messrs. The Waring White Building Co., Ltd., who are making remarkable progress. It is only just over a year since they commenced work on the site, yet the shell of the building is now complete, and work on the interior well forward. About 700 men are employed on the job. The design of the front of this building is very fine; the scheme of the colonnade against the blank wall that shields the exchange roof from view, with the well-proportioned towers at either end, and the loggia stretching low across the front, being most effective. This front is quite different to the usual kind of work, and will make the building a great addition to Liverpool. The north elevation is also noteworthy by reason of the fact that it is carried out almost entirely with a facing of cast iron. On this side of the building are placed a number of cotton sale-rooms, for which it is imperative to have an even, unobstructed light. It was found that by using cast-iron attached to the steel frame, instead of having stone piers, a great reduction in width was effected between the windows, and a corresponding reduction of shadow—a very important matter in cotton judging: this cast-iron work also enables the thickness of the walls to be reduced. Altogether about 17,500 ft. super. of cast-iron have been used. Within the building the exchange hall (140ft. by 128ft.) occupies the main space. This hall is carried to the top of the building, and lighted through a large glass roof, below which, over the cornice level, there is some excellent enriched plaster work, by Messrs. Henry Johnson & Sons, of Liverpool, while on the two floors below are colonnades, the columns being monoliths of granite, 13ft. 6ins. high, with marble bases and capitals. These columns have been supplied by Messrs. A. & F. Manuelle, of London, who have also executed marble pavings, doorways, &c., in the building. The lighting of the exchange hall is being carried out by the Northern Electrical and Ventilating Co., of Liverpool: there will be 500 electric lamps, and the light from these will be reflected, which is much more pleasing than the ordinary system of "point" lighting.

The floors and partitions throughout the building have been carried out by the Fram Fireproof Construction Co., of Manchester. The floors are formed with slightly cambered concrete blocks, made with a specially prepared fire-resisting concrete, which are fitted in between the rolled steel joists without the use of any kind of centering. The floors can be used immediately after laying, so that much time is saved by this form of construction. The partitions in the building are formed with Fram partition slabs about 3¼ ins. thick.

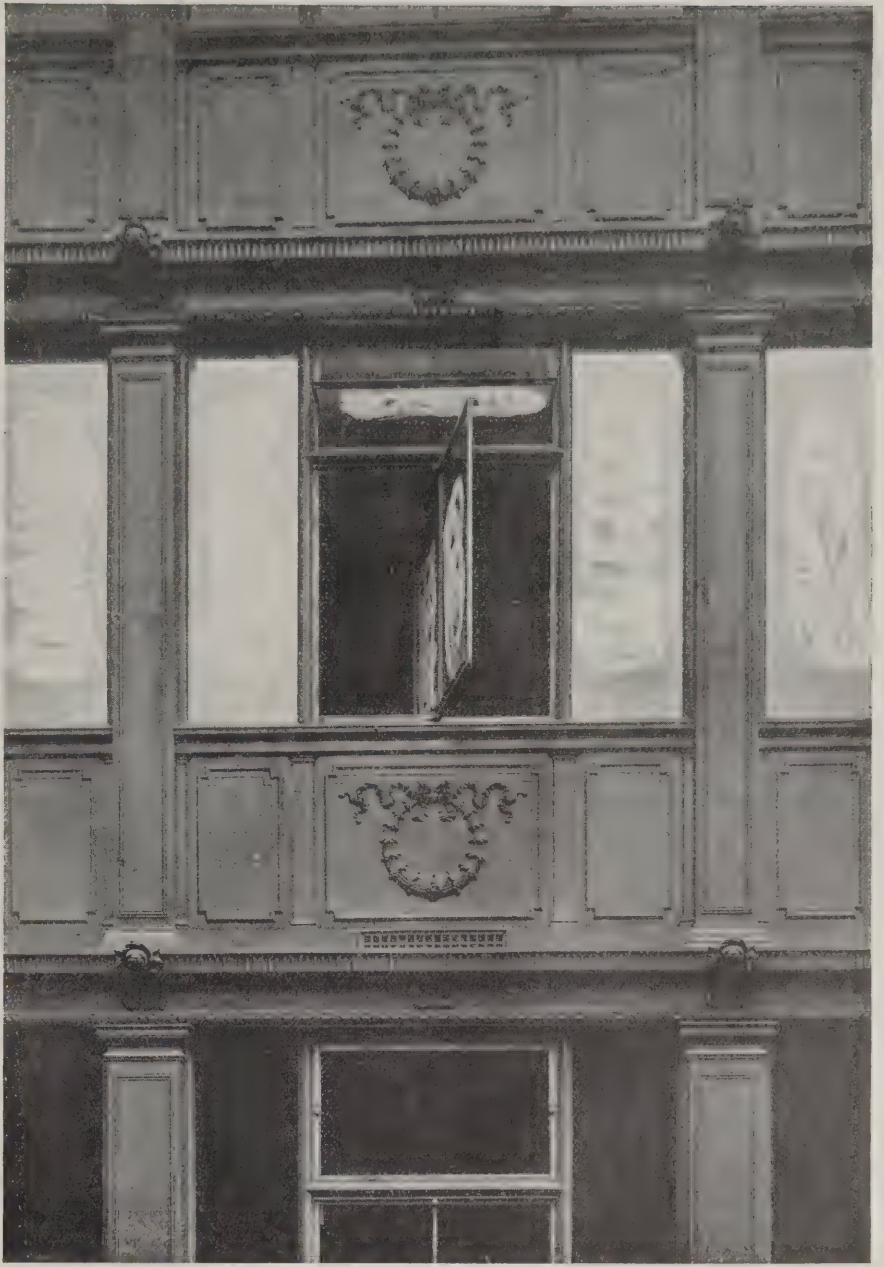
Altogether about 3,000 tons of steel have been used in the building. Round about the exchange hall the various rooms are grouped, the smoking-room and reading-room being panelled in walnut and the board-room in oak. In the basement a restaurant is to be fitted up. A complete system of lifts has been installed—twelve in all—by the Easton Lift Co., Ltd., of Westminster, and it is worth noting that the cars have been designed by the architects. The wrought-iron enclosures of the lifts are also interesting examples of design; they have been executed by Messrs. George Wragge, Ltd., of Manchester, who have also been entrusted with the stained and leaded glass work in the building, as well as the metal ceiling light and glass over the exchange hall. The total cost of the building will probably be about £210,000. Mr. S. K. Sheldon is the chief clerk of works.

The following is the list of the sub-contractors:—

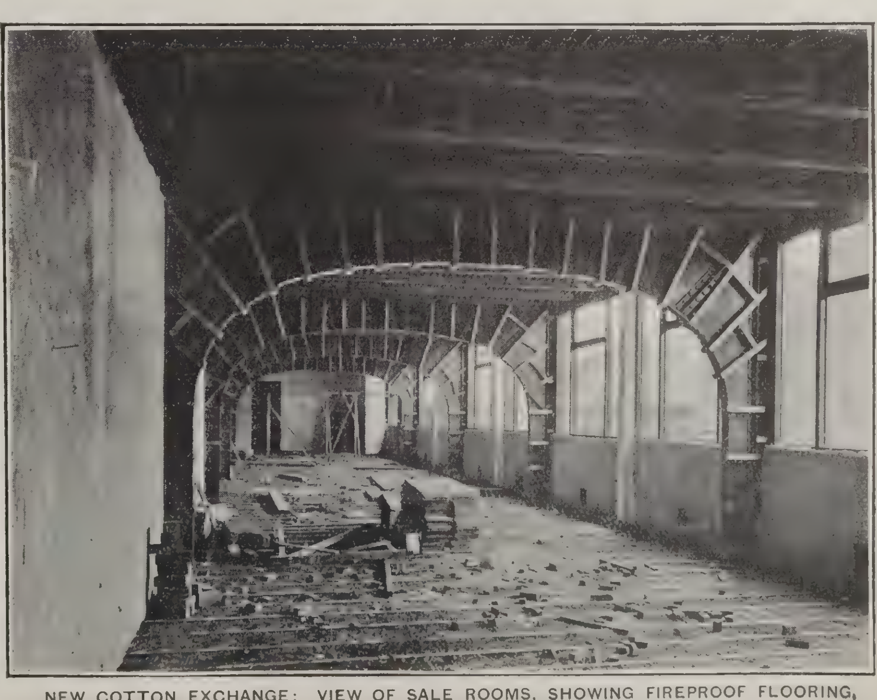
Steelwork, Ed. Wood & Co., Ltd.; *flooring, partitions and ceilings*, "Fram" Fireproof Construction Co.; *lifts*, Easton Lift Co.; *heating and ventilating*, Ashwell & Nesbit; *marble and granite*, A. & F. Manuelle; *plumbing, painting and joinery*, Waring & Gillow; *slating and plastering*, Henry Johnson & Sons; *sanitary fittings, closet divisions, wall tiling, and dados on tower staircases*, Doulton & Co.; *ornamental ironwork*, Walter Macfarlane & Co.; *steel casements and patent glazing*, Henry Hope & Sons; *marble balustrade*, Emley & Son; *electric wiring, &c.*, Northern Electrical & Ventilating Co.; *lift enclosures, ceiling lights in main hall*, George Wragge, Ltd.; *mosaic flooring*, Diespeker, Ltd.; *tiling*, Martin Van Straaten & Co.; *tiling*, George Swift; *sculpture*, Birnie Rhind; *carving and sculpture*, E. O. Griffiths; *35 instruments*, Private Wire and Telephone Installation Co.; *wrought iron gates*, Ockleston & Drayton Johnson; *asphalting*, London Asphalte Co.: *wood block flooring*, J. F. Ebner; *lightning conductors*, S. B. Bidder & Co.



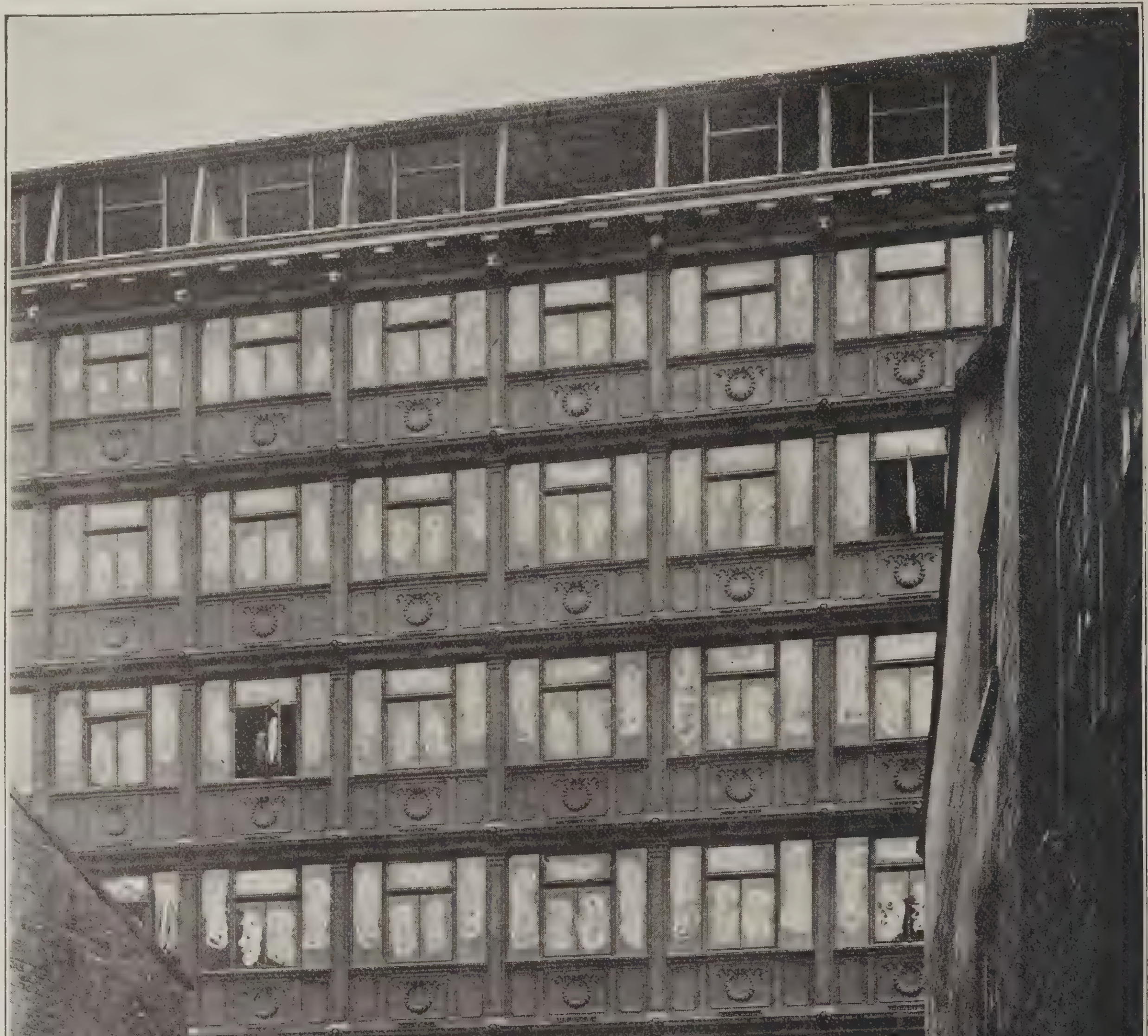
NEW COTTON EXCHANGE: GROUND FLOOR PLAN.



NEW COTTON EXCHANGE: DETAIL OF CAST-IRON WORK.



NEW COTTON EXCHANGE: VIEW OF SALE ROOMS, SHOWING FIREPROOF FLOORING.



NEW COTTON EXCHANGE, LIVERPOOL: THE CAST-IRON WORK ON THE NORTH FRONT. MATEAR AND SIMON, FF.R.I.B.A., ARCHITECTS.

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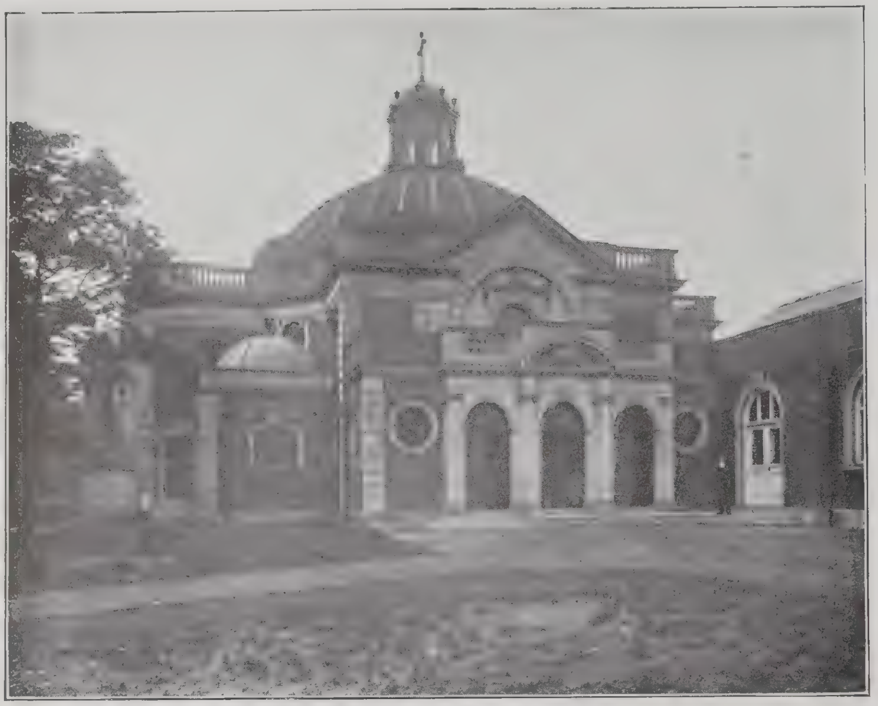
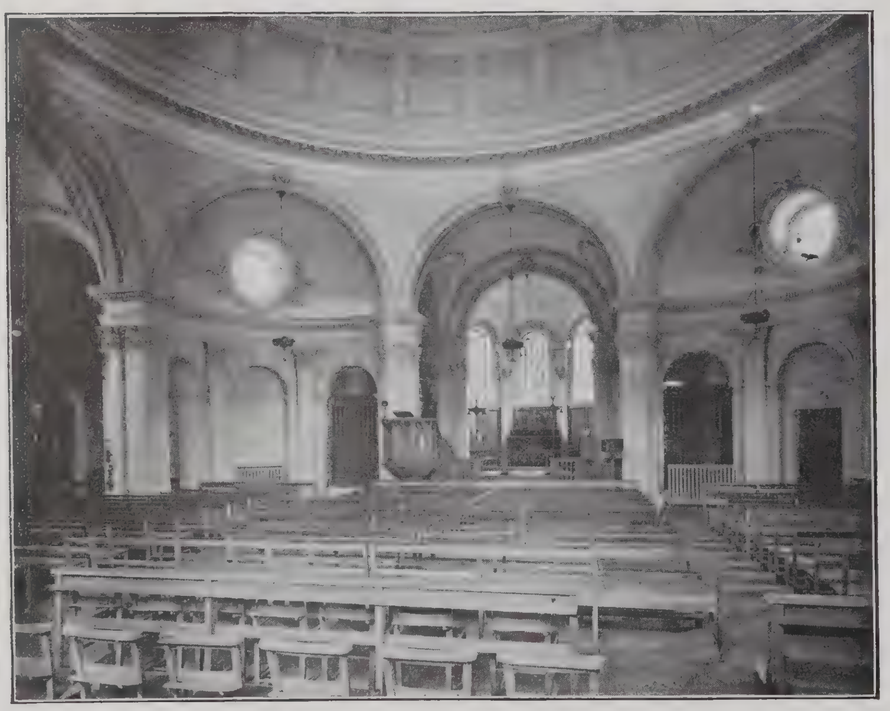
Wednesday, October 3rd, 1906.

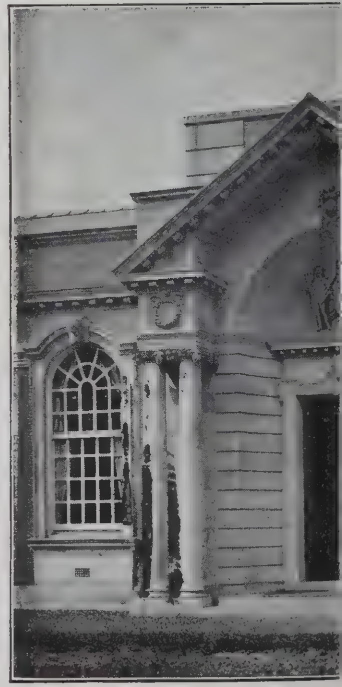


Exterior of Chapel

Centre Porti



Interior of Chapel.



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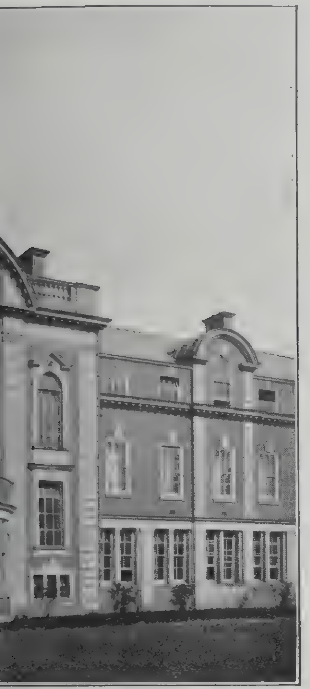
NEW BLUECOAT SCHOOL, WATERTREE, LIVERPOOL. BRIGGS AN



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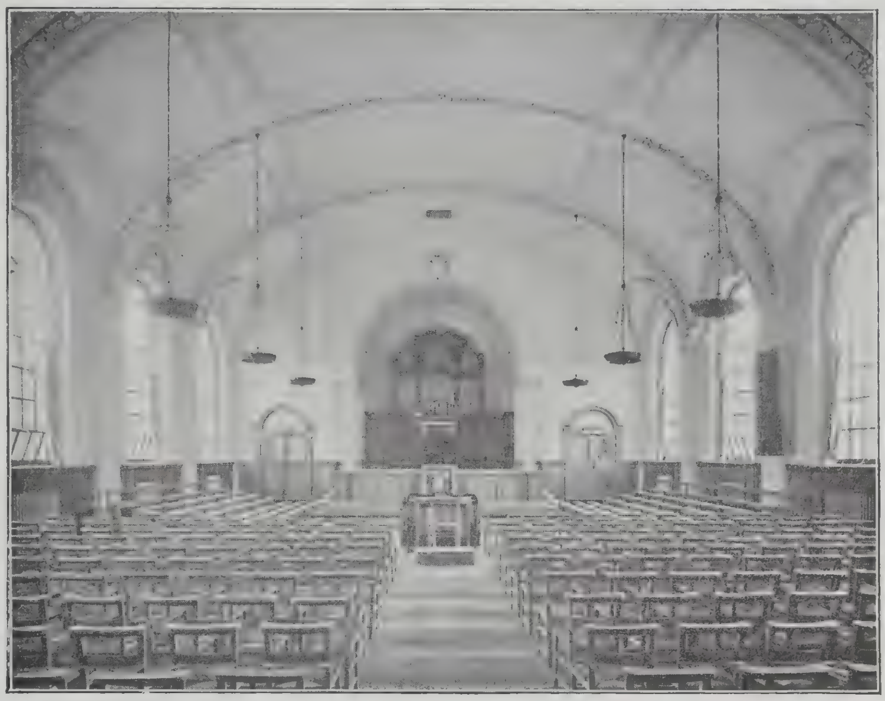

The Shirley Hall.

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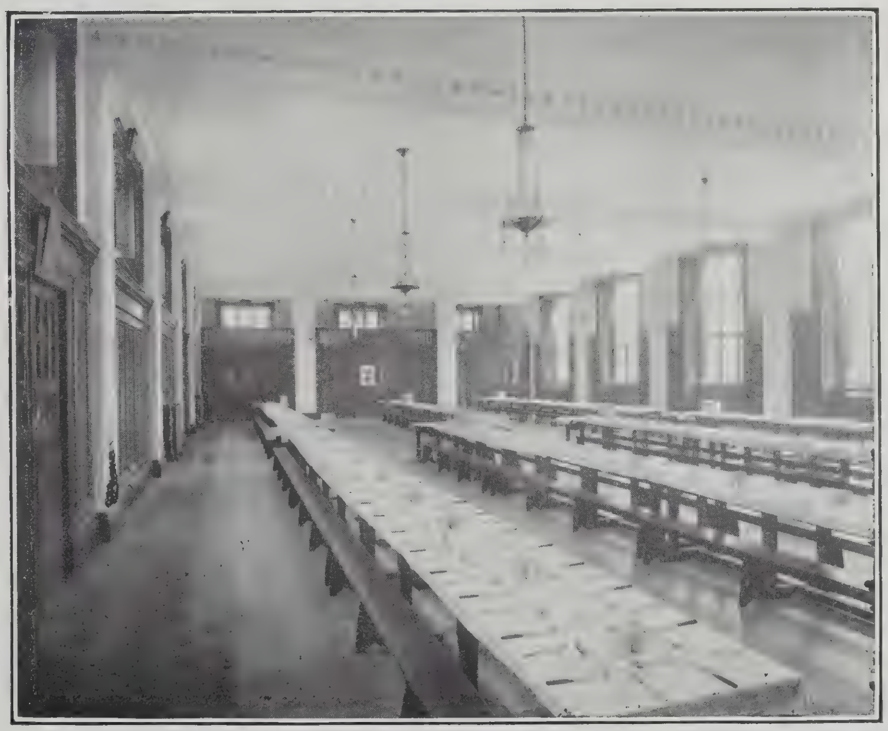

The Dining Hall.

[*Photos: Bedford Lemere & Co.*

STENHOLME, F. B. HOBBS AND ARNOLD THORNELY, ARCHITECTS.

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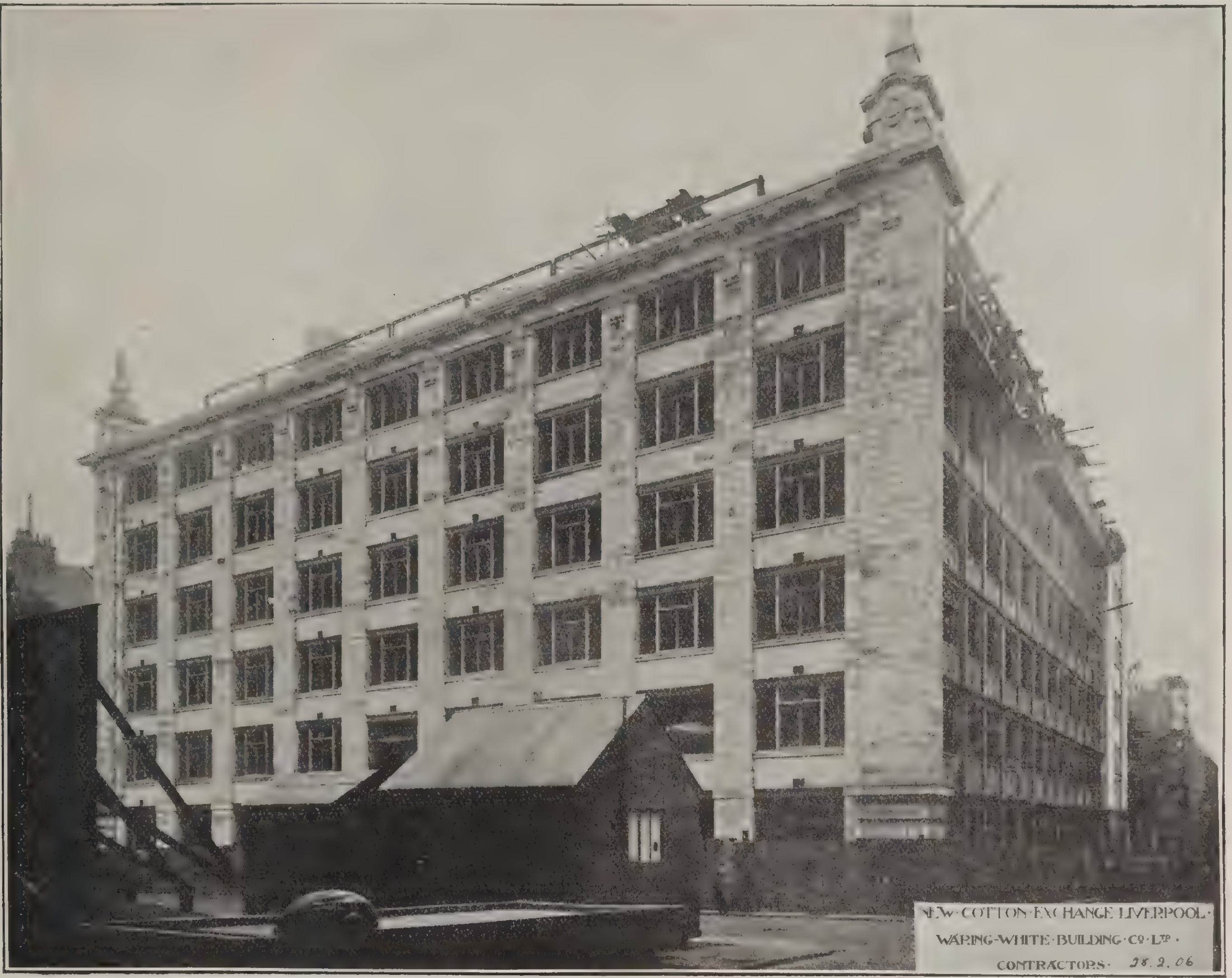
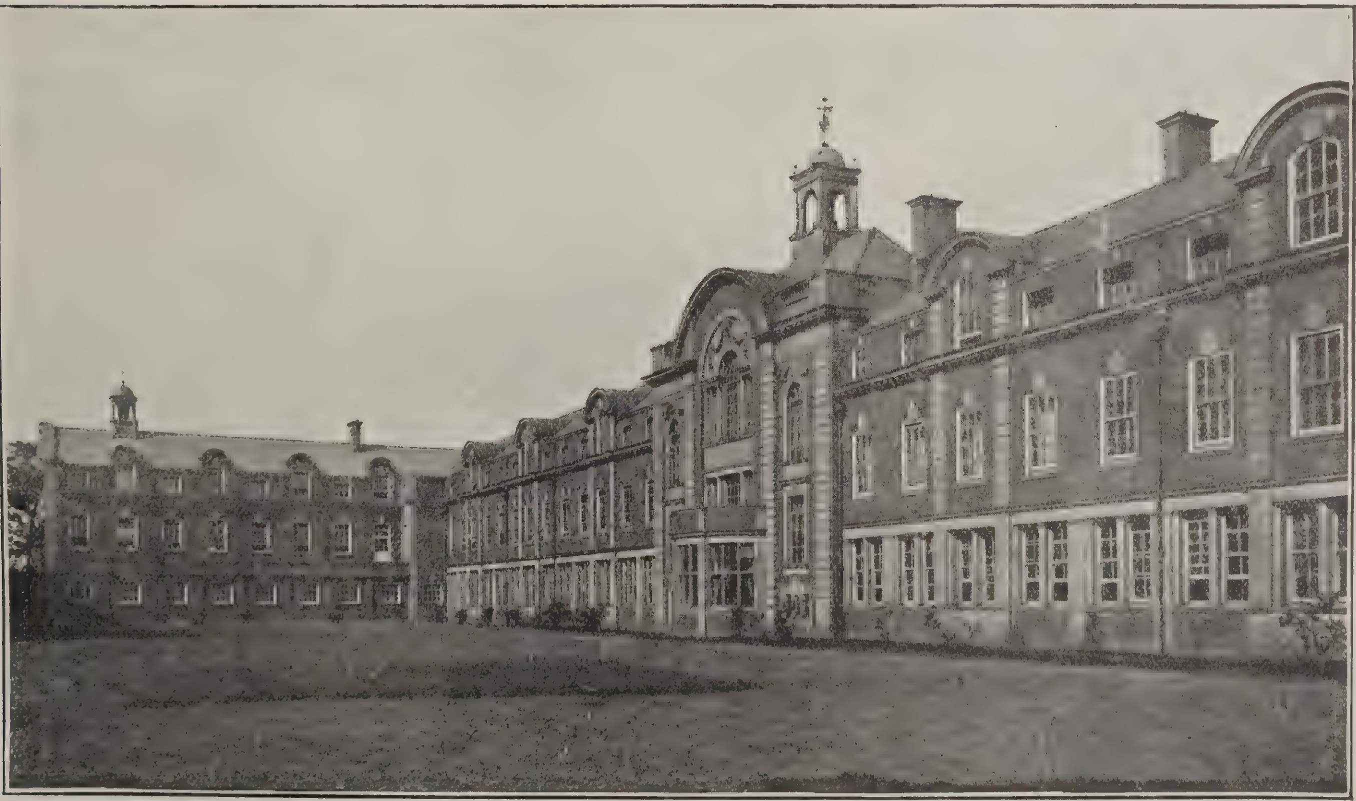
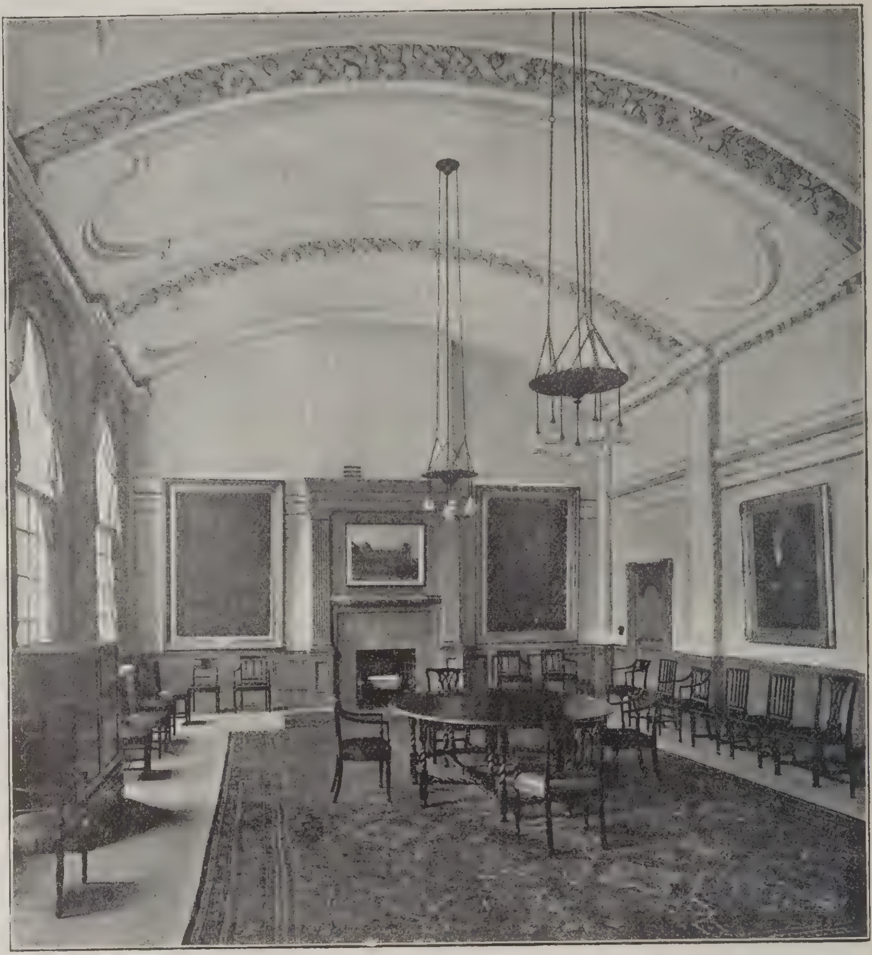


NEW COTTON EXCHANGE: REAR ELEVATION. MATEAR AND SIMON, FF.R.I.B.A., ARCHITECTS.



NEW BLUECOAT SCHOOL, WAVERTREE: WEST FRONT.
BRIGGS AND WOLSTENHOLME, F. B. HOBBS AND ARNOLD THORNELY, ARCHITECTS.

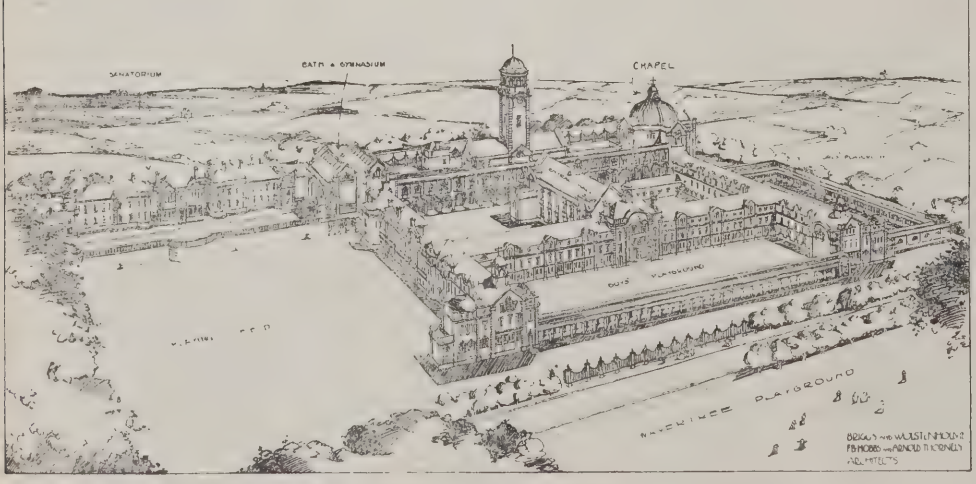
The New Bluecoat School.



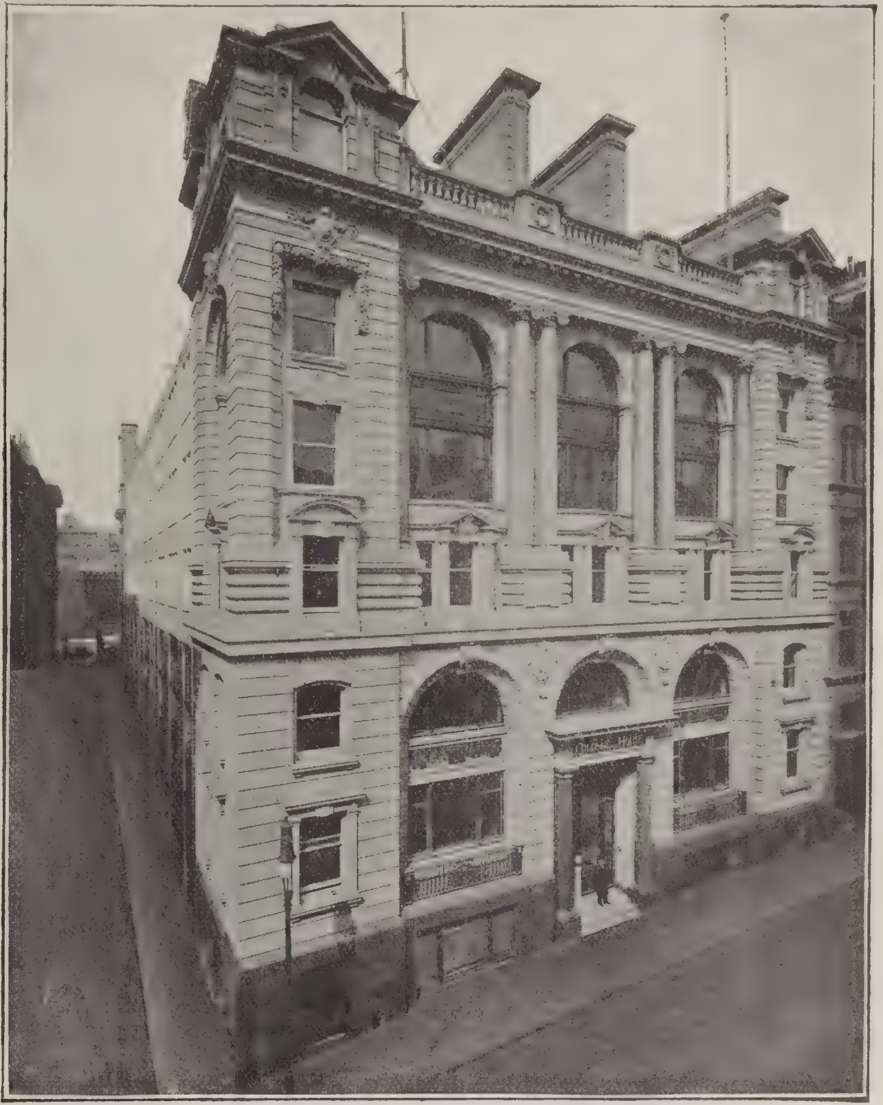
BOARD ROOM, NEW BLUECOAT SCHOOL.
BRIGGS & WOLSTENHOLME, F. B. HOBBS & ARNOLD THORNELY, ARCHITECTS

Another important new Liverpool building is the new Bluecoat School at Wavertree, one of the suburbs of Liverpool. The architects are Messrs. Briggs & Wolstenholme, F. B. Hobbs & Arnold Thornely, their design having been selected in a competition restricted to local architects. In connexion with this competition the trustees stated that, while not wishing to curb individual choice of style, they were desirous of recalling the architectural character of the front of the old Bluecoat Hospital, which remains still in School Lane, behind St. Peter's Church; it was erected in 1708, and is a good example of Georgian work (it is open for sale to anyone who wants the site). The new school provides accommodation for 250 boys and 150 girls. It is carried out in 2⅝-in. red Ruabon bricks with Grimshill stone dressings, and the roofs slated. The complete scheme is not yet carried out, as a gymnasium and swimming bath are to be erected at one side of the main front, opposite the chapel, and further north a sanatorium in connexion with the school is to be built; while the tower shown in the accompanying sketch has also to be added. On the ground floor of the centre block behind the main front is the dining-hall, very effectively lined with green-stained whitewood, treated squarely and architecturally, the ceiling being of plaster, enriched somewhat, and the floor of wood blocks. Above this room is what is called the Shirley Hall (75ft. by 46ft.). This commemorates the founders of the school, and is used for services. It also is panelled throughout with whitewood, left plain; the ceiling is barrel-shaped, and the organ at one end of the room is from the old school. The dormitories in the building do not call for any special comment, but the arrangement of the lavatories is certainly worthy of special mention. The basins are set around the walls and in series across the room, but the special feature is the arrangement of towel holders. To an outsider the matter might not appear to be of much import, but the managers of the school have experienced considerable difficulty in respect of towels. Various arrangements have been tried, such as rollers, &c., but the system of having a towel for each boy and each girl hung on its own special bracket has been found to be the best. At one side of the main front of the school is the chapel. This is a very delightful little building, octagonal on plan and domed over; the dome being of reinforced concrete and 44ft. in diameter. The interior of the chapel is faced with Bath stone up to the cornice, and plastered above: the woodwork and seating being of whitewood, left plain, as in the Shirley Hall. This chapel is the gift of Mr. Fenwick Harrison. About the building in several places children's heads are carved—as in the keystones to the master's house. These are particularly effective, and Mr. Thornely (who, we believe, is responsible for them) is to be congratulated on their design; his inspiration has come apparently from the old school. The cost of the new building at Wavertree has been about £90,000, exclusive of site. Messrs. Morrison & Sons were the general contractors. The subcontractors were:—

Heating, ventilating and fire mains, Dargue, Griffiths & Co., Ltd., Liverpool; *sanitary fittings*, D. & G. Musgrave, Horwich: *kitchen fittings*, James Cooper & Sons, Liverpool; *metal casements*, James Gibbons, Wolverhampton; *lead lights*, Gustave Hiller, Liverpool; *door springs, locks and furniture*, Quiggin Brothers, Liverpool; *terrazzo and mosaic floors*, Diespeker, Ltd., London; *marble work*, J. Stubbs & Sons, Liverpool; *laundry fittings*, Thomas Bradford & Co., Manchester; *electric wiring and fittings*, Alliance Electrical Co., Ltd., Birmingham; *ornamental fittings, and metal casements and lead lights to chapel*, George Wragge, Ltd. Manchester; *hand-power lifts*, Archibald Smith & Stevens, London; *lightning conductors*, Aird & Anderson, Liverpool; *grates and mantels*, The Well Fire Co., London; *towel rails*, &c., Brookes & Co., Ltd., Manchester; *sliding partitions*, North of England School Furnishing Co., Darlington; *classroom furniture*, Bennet Furnishing Co., Glasgow; *blinds and curtains*, Pioneer Furnishing Co., Liverpool; *stone carving*, E. O. Griffiths, Liverpool: *wood carving*, Earp, Hobbs & Miller, Manchester; *rainwater heads and wrought-iron railings*, Lockerbie & Wilkinson, Birmingham; *wrought-iron balustrades*, E. Worrall, Liverpool; *furniture*, James Parkinson, Liverpool; *laying-out ground*, L. Marr, Liverpool; *asphalt to roads and playgrounds*, Robinson, Heys & Co., Blackburn; *wrought-iron railings to playgrounds*, Thomas Brawn & Co., Birmingham; *organ in chapel*, Walker & Sons, London.



BIRD'S-EYE VIEW OF NEW BLUECOAT SCHOOL AT WAVERTREE.



COLONIAL HOUSE, WATER STREET. BRIGGS AND WOLSTENHOLME, F. B. HOBBS AND ARNOLD THORNELY, ARCHITECTS.

Colonial House.

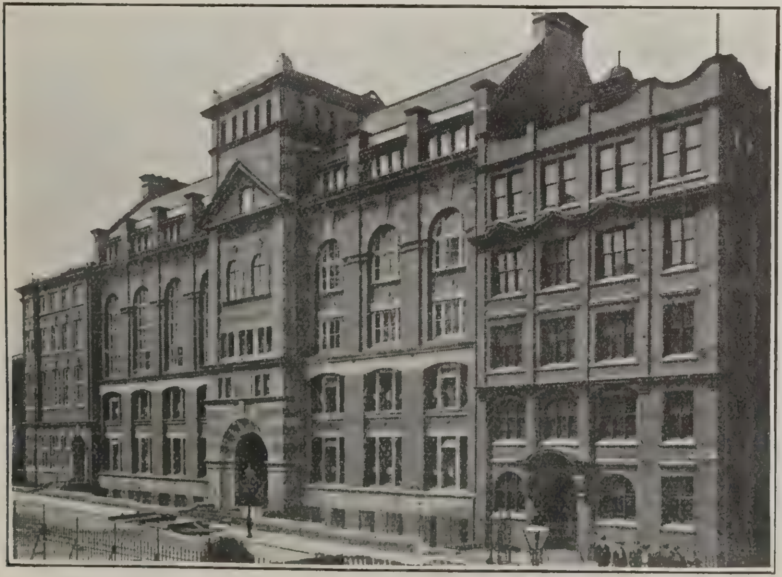
The architects of the new Bluecoat school were also the architects of Colonial House, in Water Street, the new head-offices of Messrs. Elder, Dempster & Co. The two facades of the building are carried out in Cefn stone, with red granite columns extending from first to third floors, and the base of the building also in red granite. The main office of the company on the ground floor measures 140ft. by 70ft., extending the entire width of the building; it is lighted on both sides, and also by seven domes; the furnishing throughout is of mahogany, and the floor rubber-covered. Two principal staircases give access to commodious offices on the upper floors. The heating and ventilating of the building was carried out by Messrs. Dargue, Griffiths & Co., Ltd., of Liverpool.

David Lewis Workmen's Hostel.

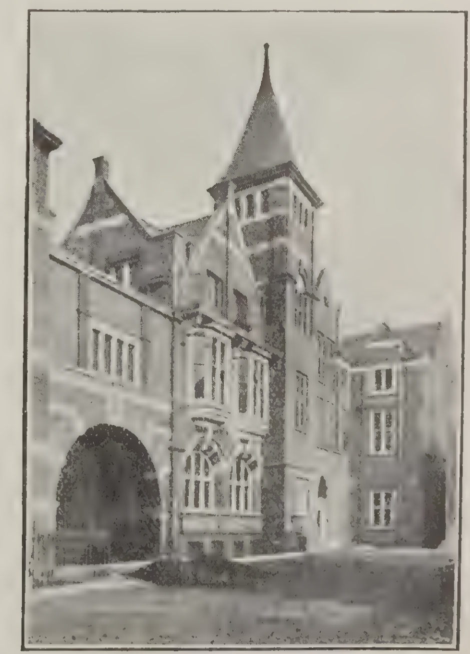
Another new building in Liverpool is the David Lewis Workmen's Hostel and Club, completed in 1904 from designs by Mr. J. Francis Doyle. This building was very fully illustrated in our issue for January 18th, 1905. It provides a workmen's home and club and public hall, very much on the lines of the Rowton Houses in London. The main frontage is to Great George Place. The building is not particularly striking architecturally, as, necessarily, the cost has imposed considerable restrictions, though the total, including site and furnishing, was £100,000. It is, nevertheless, instructive internally, being well planned. Accommodation is provided for about 800 persons.

New Laboratories at Liverpool University.

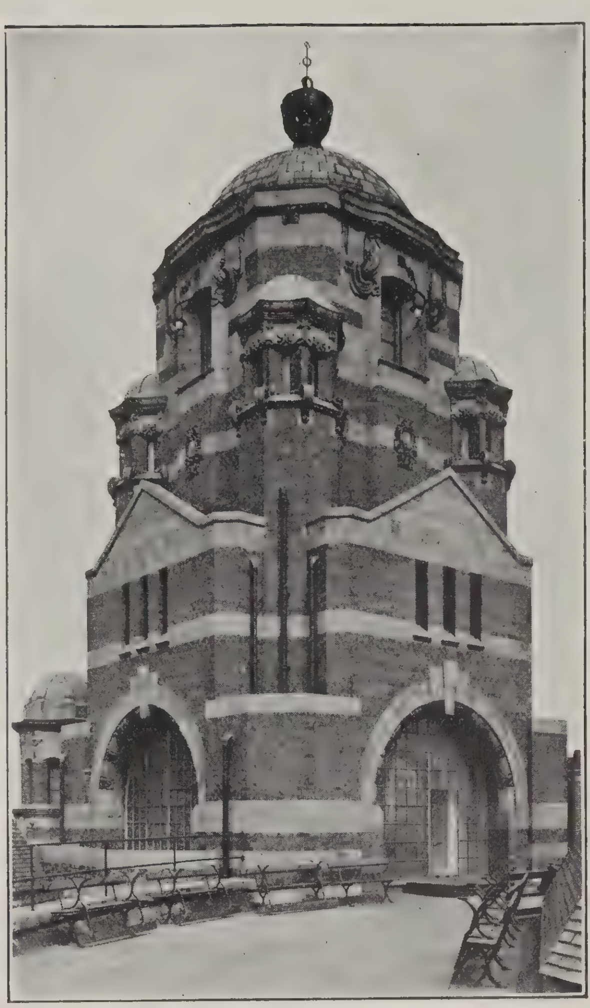
At Liverpool University several additions have recently been completed. A good block comprising zoological and electrotechnics laboratories has been erected from designs by Messrs. Willink & Thicknesse, and new medical buildings (opened in 1904) from designs by Mr. Paul Waterhouse, who has followed the style of the main buildings designed by his father, the late Mr. Alfred Waterhouse. The new medical buildings, like other blocks in the University group, are faced with local bricks and dressings of red Ruabon bricks. The George Holt Physics Laboratory is another new addition to the University. This adjoins the new Johnston Bacteriological Laboratory, with which it communicates on the first floor by a bridge. A photograph of the building (taken by Mr. William Riding, the clerk of works) is shown on this page. It is carried out in red bricks with Storeton stone dressings; the tower is open all the way down and fitted with a lift—for experimental purposes: the tower is also used to support a water tank. Messrs. Willink & Thicknesse and Prof. F. M. Simpson were the joint architects for this laboratory. The building rests on solid rock and special precautions have been taken to prevent vibration.



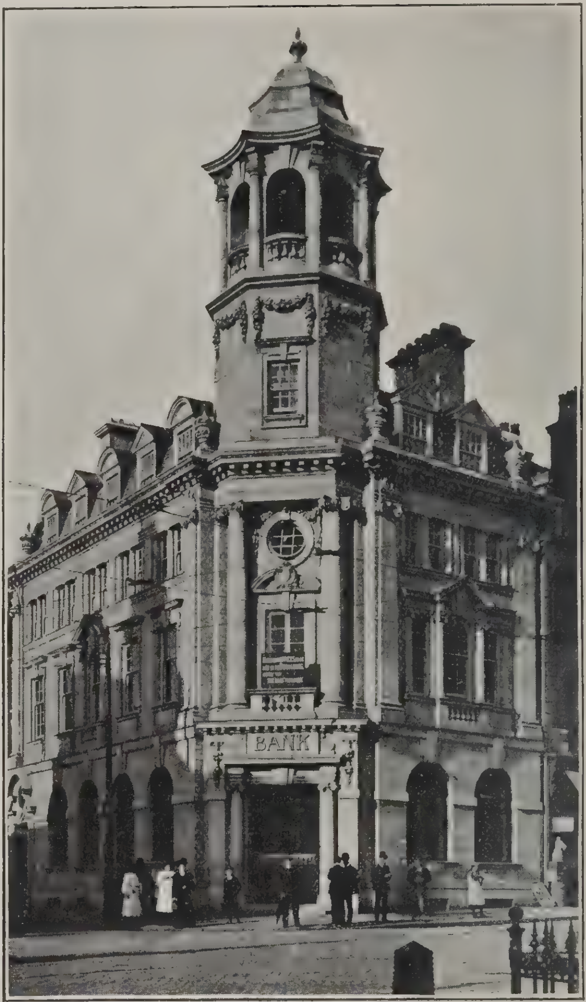
ZOOLOGY AND ELECTRO-TECHNICS BLOCK, LIVERPOOL UNIVERSITY. WILLINK AND THICKNESSE, ARCHITECTS.



GEORGE HOLT PHYSICS LABORATORY, LIVERPOOL UNIVERSITY. WILLINK AND THICKNESSE AND PROF. F. M. SIMPSON, JOINT ARCHITECTS.



NEW CENTRAL HALL: TOP OF TOWER.
BRADSHAW AND GASS, FF.R.I.B.A., ARCHITECTS.

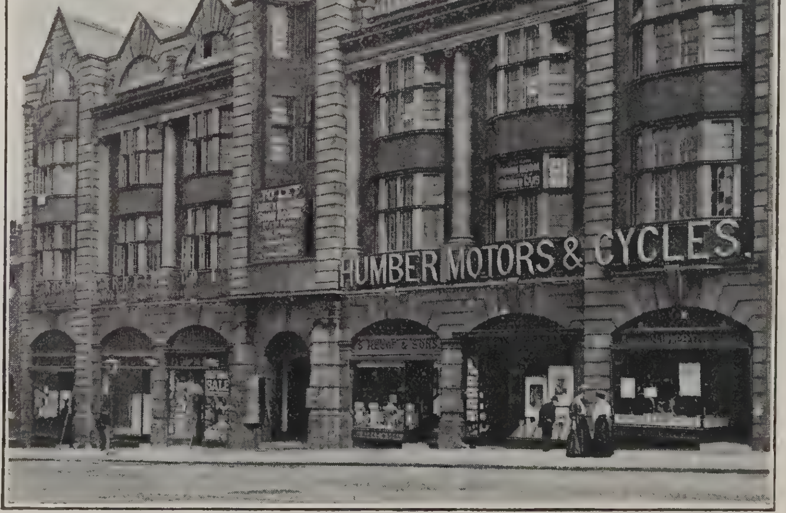


BANK OF LIVERPOOL, CORNER OF MOSS STREET AND PRESCOT STREET. J. FRANCIS DOYLE, F.R.I.B.A., ARCHITECT.

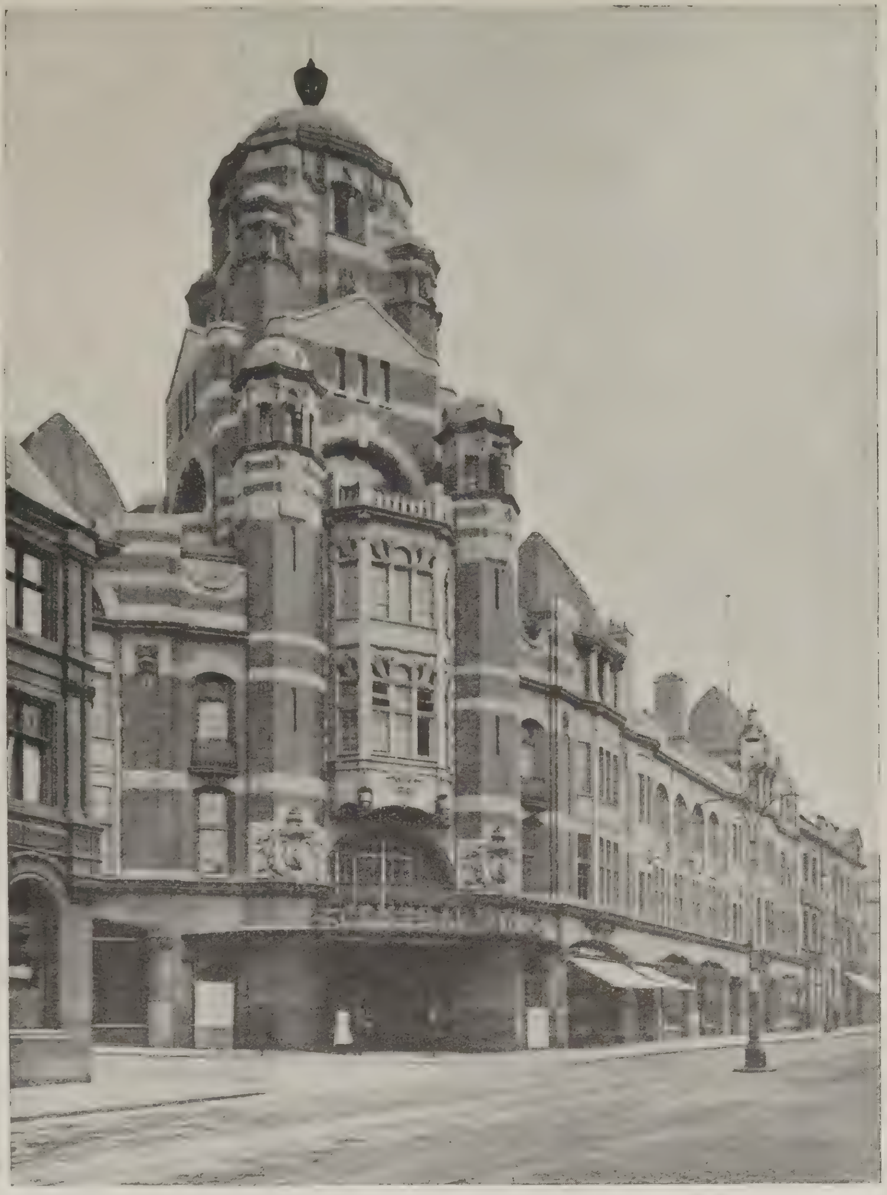
The New Central Hall.

In Renshaw Street a new "Central Hall" has been erected by the Wesleyan authorities, in memory of the Rev. Charles Garrett. The exterior is carried out in terra-cotta and brick, and there is about the pile a sort of theatrical effect, after the style of some of the modern German work. This is best shown by the illustration on page 173. The dome is of steel construction, and covered with terra-cotta tiles specially made by the Hathern Station Terra-Cotta Co. Within the building there is a large hall, excellently arranged for meetings, &c., capable of seating over 2,200 people, the plan being roughly that of a horse-shoe. A gallery is arranged all round and the seats in this portion of the building, as well as those on the floor of the hall, are admirably placed for hearing and getting a good view of the speaker on the platform. The seats are of the tip-up pattern and grouped together with wide passage-ways between—leading out into a crush corridor which gives access to the numerous exits. Immediately below this large hall are a lecture hall (provided with more than 700 chairs), a reception hall, a drill hall for the Boys' Brigade, and 36 other rooms for administrative purposes and young men and women's recreation rooms. The total cost of the scheme was £40,000. Messrs. Bradshaw & Gass, FF.R.I.B.A., of Bolton, were the architects, with whom was associated Mr. A. J. Hope. The clerk of works was Mr. W. A. Lowry. Messrs. William Brown & Sons, of Salford, were the general contractors. The sub-contractors were :—

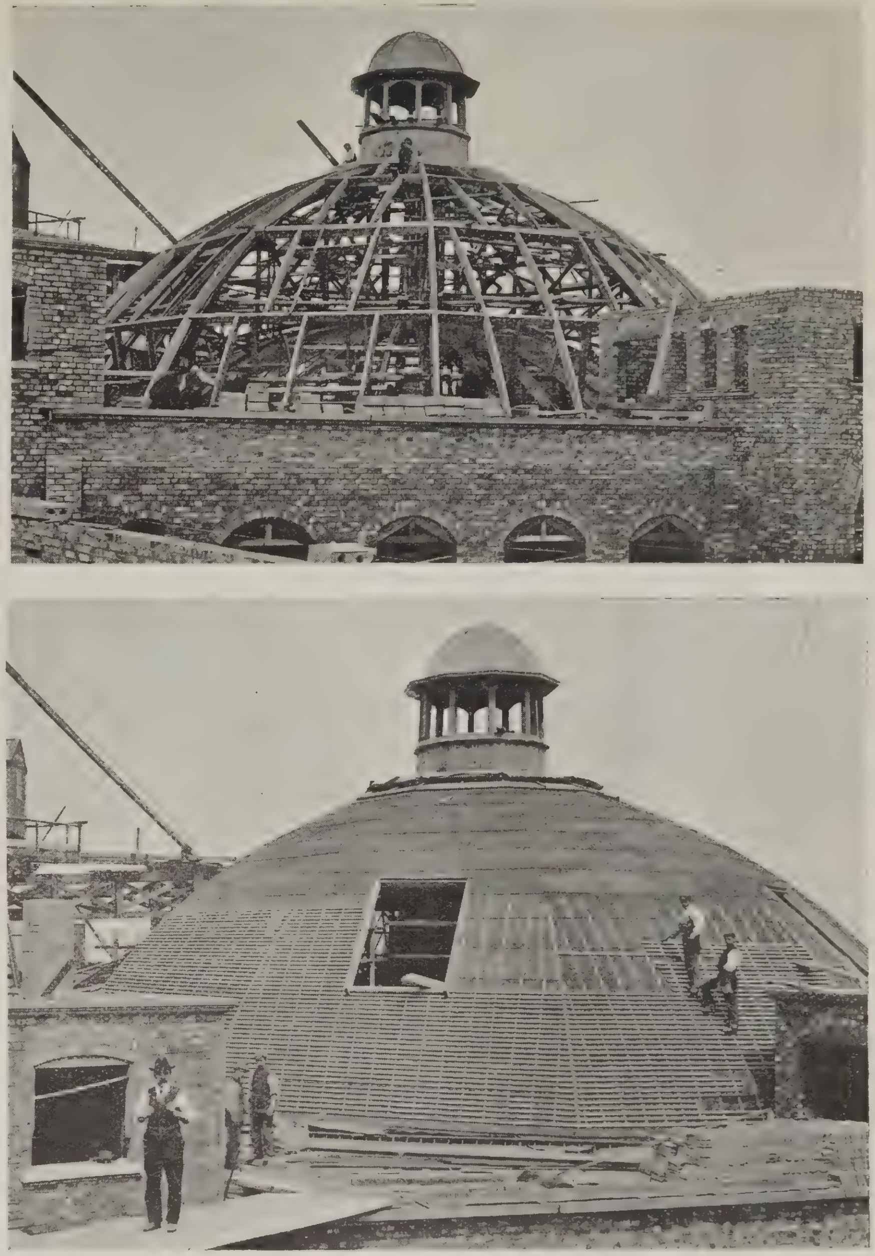
Concreting, marble mosaic, roof tiling, plastering, and fibrous work, J. B. Johnson & Co., Liverpool; *plumbing and glazing*, R. Heyworth & Co., Manchester; *ornamental glazing*, Walter J. Pearce, Ltd., Manchester; *steel sashes and casements*, George Wragge, Ltd., Manchester; *heating and ventilating*, Dargue, Griffiths & Co., Ltd., Liverpool; *electric lighting*, A. Maund, Southport; *ornamental ironwork*, Thomas Powers, Manchester; *wall tiling*, Decorative Glass Co., Lancaster; *hall seatings and furnishings*, D. & H. Waddington, Bolton; *kitchen and bar fittings*, Fletcher, Russell & Co., Ltd., Warrington; *locks, door furniture, &c.*, Marley Bros., Birmingham.



ROAD CARRYING CO.'S BUILDING, LEECE STREET. THOMAS PRICE, ARCHITECT.

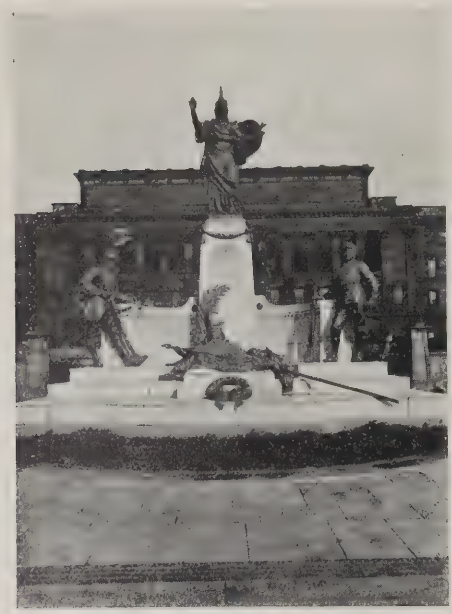


General View.

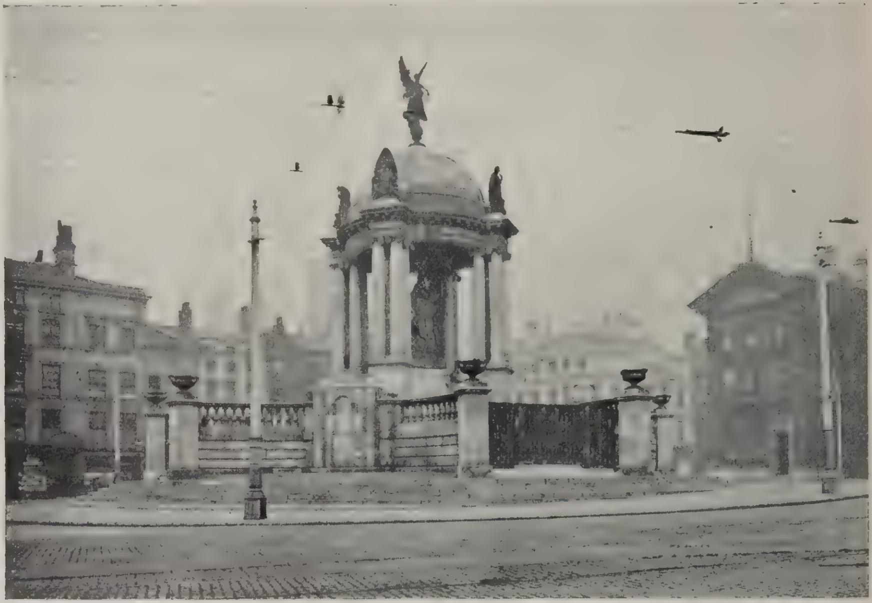


Construction of Dome over Hall.

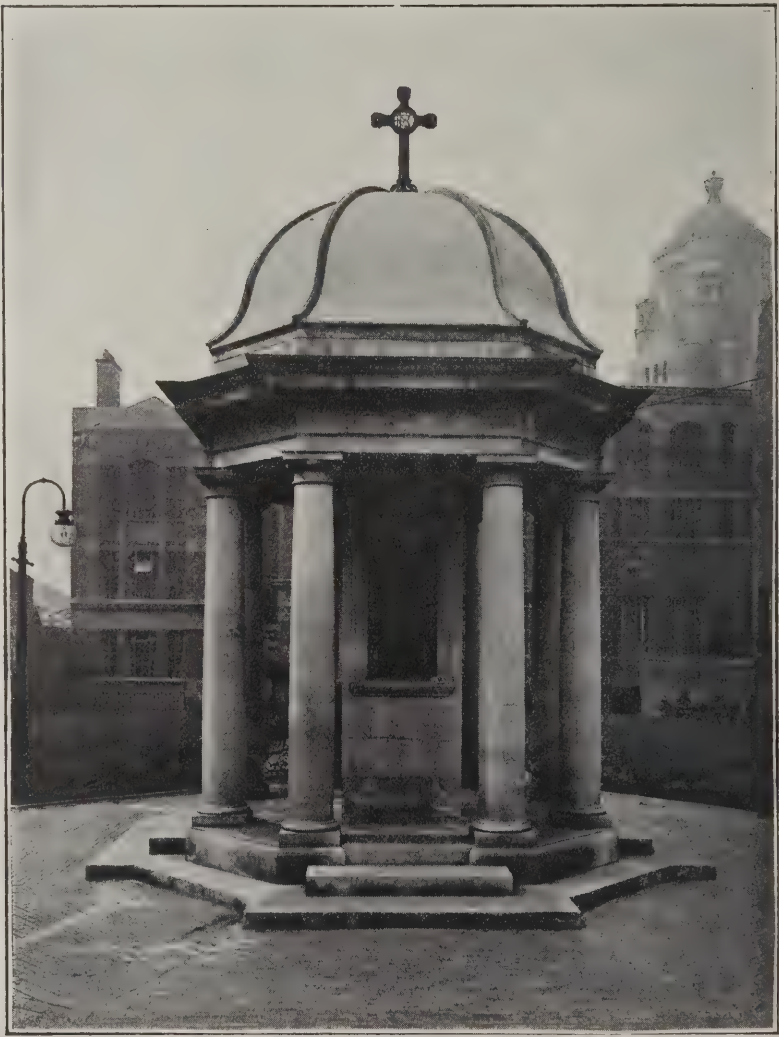
NEW CENTRAL HALL, RENSHAW STREET, LIVERPOOL. BRADSHAW & GASS, FF.R.I.B.A., ARCHITECTS.



MEMORIAL TO KING'S OWN REGIMENT IN ST. JOHN'S GARDENS. W. GOSCOMBE JOHN, A.R.A., SCULPTOR.



QUEEN VICTORIA MEMORIAL, LORD STREET. PROF. F. M. SIMPSON AND WILLINK AND THICKNESSE, JOINT ARCHITECTS. C. J. ALLEN, SCULPTOP.



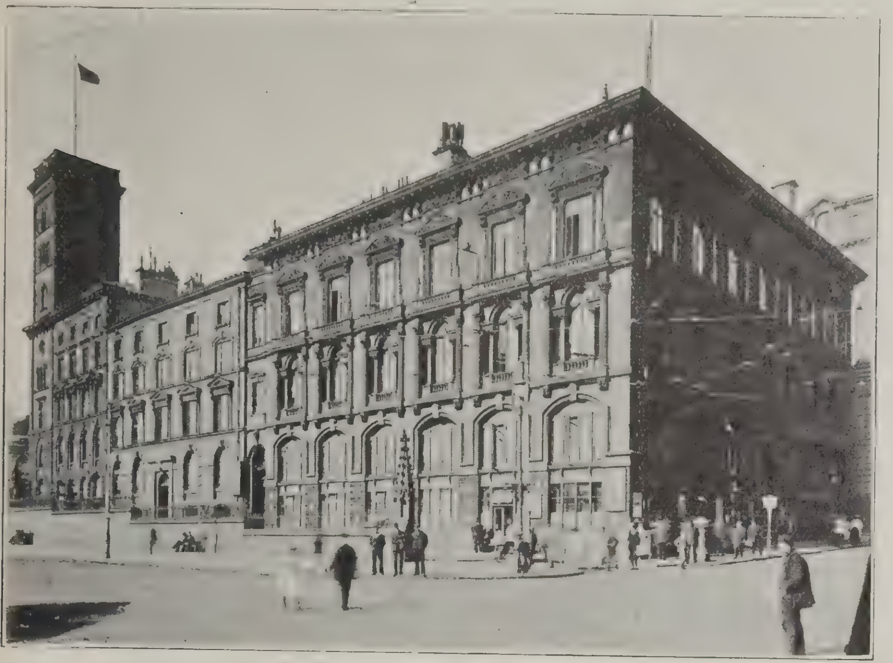
RENSHAW STREET CHAPEL MEMORIAL. THOMAS SHELMERDINE, CORPORATION ARCHITECT.

Liverpool Memorials.

At the back of the new Central Hall, and facing Mount Pleasant, there is an enclosed garden, at one end of which is a very well-designed memorial, the architect of which was Mr. Thomas Shelmerdine, of Liverpool. This is a memorial of the Renshaw Street Chapel, which formerly occupied the site. It is carried out in Portland stone, and has a bronze plaque on two of its faces. The cornice is flashed with lead and the dome covered with glazed tiles of a pale sea-green tint. Round about it is a path extending across the garden in the form of a long cross, the memorial being placed at the junction of the arms. This path is laid with 2-in. red bricks, a gutter being formed with bricks of ordinary size, and a rounded edging. The architect has done his part of the work well, and it is to be regretted that those responsible for the rest should have introduced such ordinary garden seats about the place, these being of the stock pattern with pitch-pine slats on a flat iron frame. The electric-light standard near the memorial is also a blemish, and should be replaced by something better. The entrance to the garden is furnished with beaten ironwork gates, formerly at the old chapel. They were made by Mr. E. Worrall, of Iron Gate Works, Liverpool.

Another new memorial in Liverpool, and an important one, is that to Queen Victoria at the top of Lord Street. This was completed a long time ago, but for some reason or other it was not unveiled until Thursday last, when Princess Louise performed the ceremony. The joint architects are Prof. F. M. Simpson and Messrs. Willink & Thicknesse, with whom was associated Mr. C. J. Allen as sculptor. All have worked well together, and the memorial is certainly a very good piece of work. The stone used is Portland, and the sculptor-work is in bronze. Round about the base of the dome, which is supported by sixteen Ionic columns grouped together in fours, are the figures of Justice, Peace, Charity and Wisdom, while on the top of the dome is the figure of Fame. The four pedestals in the balustrading around the memorial are at present unoccupied, but it is intended that groups representing Education, Commerce, Agriculture and Manufacture shall be set up on them. The central statue of the Queen (14ft. 6ins. high) was cast by Messrs. J. W. Singer & Co., of Frome, and the figures on the dome by Mr. A. B. Burton, of Thames Ditton, the lead vases (2ft. 8ins. diameter) having been supplied by Messrs. Thomas Elsley, Ltd. The contractors were Messrs. W. Thornton & Sons.

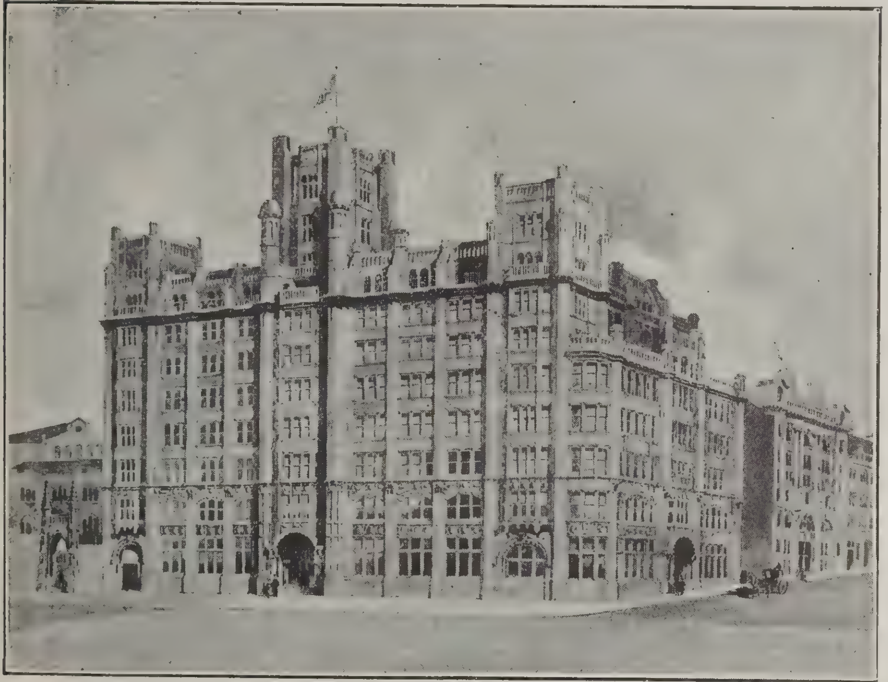
The third new memorial in Liverpool worthy of attention is that to men of the King's Own Regiment in the centre of St. John's Gardens, adjoining St. George's Hall. This is a tribute to the ability of Mr. Goscombe John, A.R.A. It comprises a central pedestal, on which is a bronze figure of Britannia, and on either side a curved parapet, with figures of soldiers at the ends, one of 1685 (in which year the regiment was enrolled) and one of 1902. In front of the pedestal are regimental trophies, and at the back is a drummer-boy. The memorial is of grey granite (supplied by Messrs. Kirkpatrick Brothers), the pedestal having been cut from a block containing 15 tons.



"TOWER BUILDINGS," WATER STREET.

New Tramway Offices.

In Hatton Garden new tramway offices are being completed from the design of Mr. Thomas Shelmerdine, the Corporation architect and surveyor. The front has three bays carried out in Hall Dale stone—which are, we think, the best portions of the building. A plan of the offices was given in our issue for December 20th, 1905. The frontage to Hatton Garden is about 184ft., and at one side is an archway leading to the car-shed. The work is being carried out by Messrs. Thornton & Sons, contractors, of Liverpool, the cost (exclusive of fittings and furniture) being put at £48,650.



BLOCK OF OFFICES TO REPLACE "TOWER BUILDINGS."
W. AUBREY THOMAS, ARCHITECT.

Prudential Building.

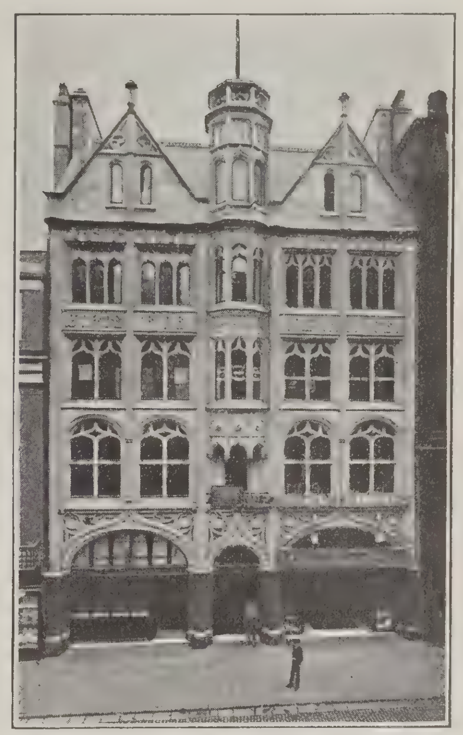
In Dale Street is a new building for the Prudential Assurance Company, by Mr. Waterhouse. The effect of this building is not, we consider, particularly happy, more especially on account of the colour of the red terra-cotta used in its construction; but the outline of the tower, which is carried up on the main front of the building, is very good, and its treatment as a combination of a tower and a chimney is somewhat novel. Inside the building, in the general office, there is a very elaborate geometrical panelled ceiling in hand-worked plaster, executed by Messrs. J. B. Johnson & Co., of Liverpool.

State Insurance Building.

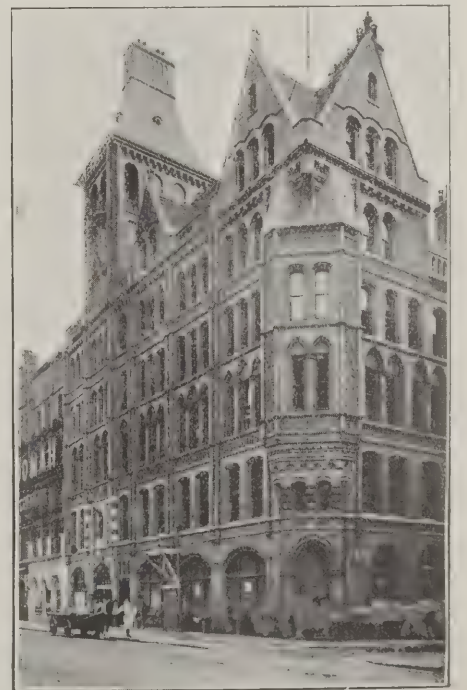
Further down the street is another new insurance building—for the State Insurance Co. The architect of this building is Mr. W. Aubrey Thomas, of Liverpool. On the ground floor is a restaurant, in which extensive onyx and marble decoration has been carried out by Messrs. John Stubbs & Sons, of Liverpool. Mr. Aubrey Thomas is also the architect of a new block of business premises in the Goree and also for a huge new block which is to be erected on the site of the existing

"Tower Buildings"

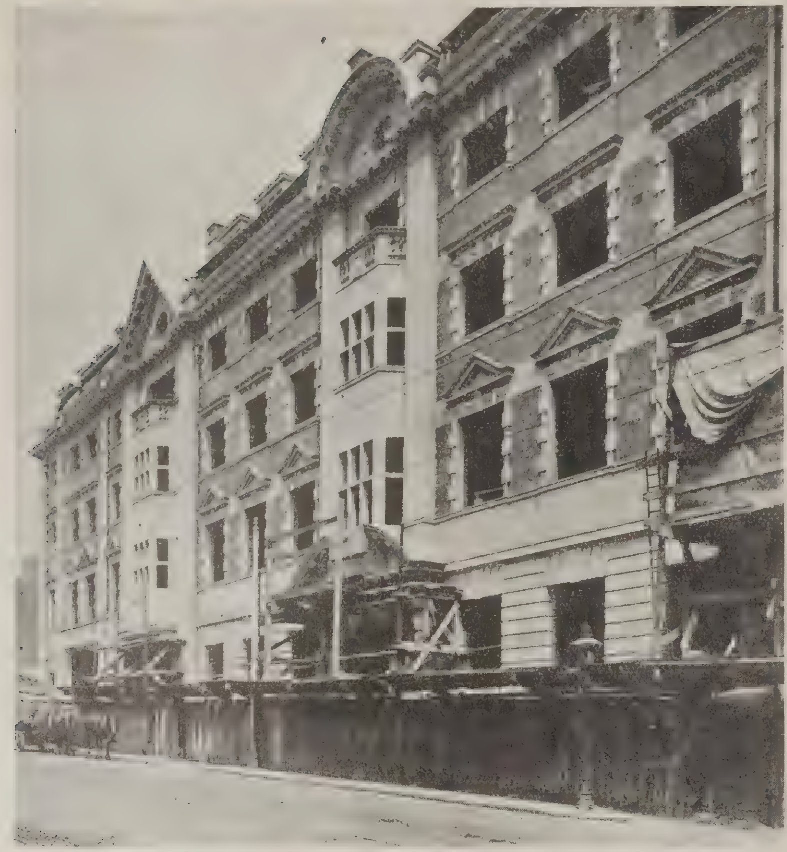
at the bottom of Water Street, extending towards St. Nicholas's Church. "Tower Buildings" was erected in 1886 and has an interest for Liverpool citizens as marking the site of the old tower which once played a rather important part in the history of Liverpool; it was demolished in the early part of the nineteenth century. The new block of offices is to be eight storeys high, with towers carried up eleven storeys, the centre portion rising to 152ft. The building, covering half-an-acre of ground, will be occupied by various steamship companies and shipowners. The work of demolishing "Tower Buildings" will be commenced in December, and it is expected the new block will be completed in 1908.



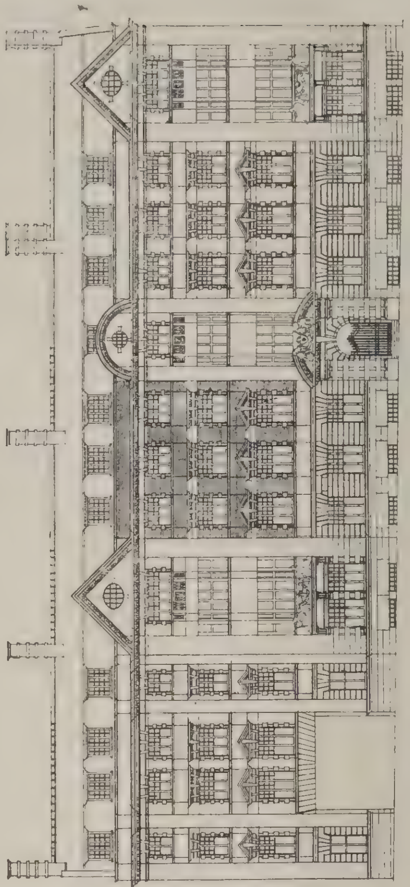
STATE INSURANCE BUILDING, DALE STREET.
W. AUBREY THOMAS, ARCHITECT.



PRUDENTIAL ASSURANCE BUILDING, DALE STREET.
A. WATERHOUSE & SON, ARCHITECTS.



NEW TRAMWAY OFFICES, HATTON GARDEN. THOMAS SHELMERDINE, CORPORATION ARCHITECT AND SURVEYOR.



ELEVATION OF NEW TRAMWAY OFFICES, HATTON GARDEN.

Messrs. Lee's Extension.

In Houghton Street an extension to Messrs. Lee's building has been erected from designs by Messrs. Matear & Simon, the architects of the new Cotton Exchange. Here, again, cast-iron work is employed, the whole frontages of the building being encased with it and painted a blue-grey colour. It is, perhaps, a question whether the casting is not in too high relief, but certainly it is very well designed, and the building is of much interest. The work has been carried out by Messrs. E. F. Blakeley & Co., of Vauxhall Ironworks, Liverpool.

Other New Liverpool Buildings.

In Leece Street a well-designed building of terra-cotta has been erected for the Road Carrying Co., Ltd., by Messrs. Haigh & Co., of Liverpool. The architect was Mr. Thomas Price, of Liverpool.

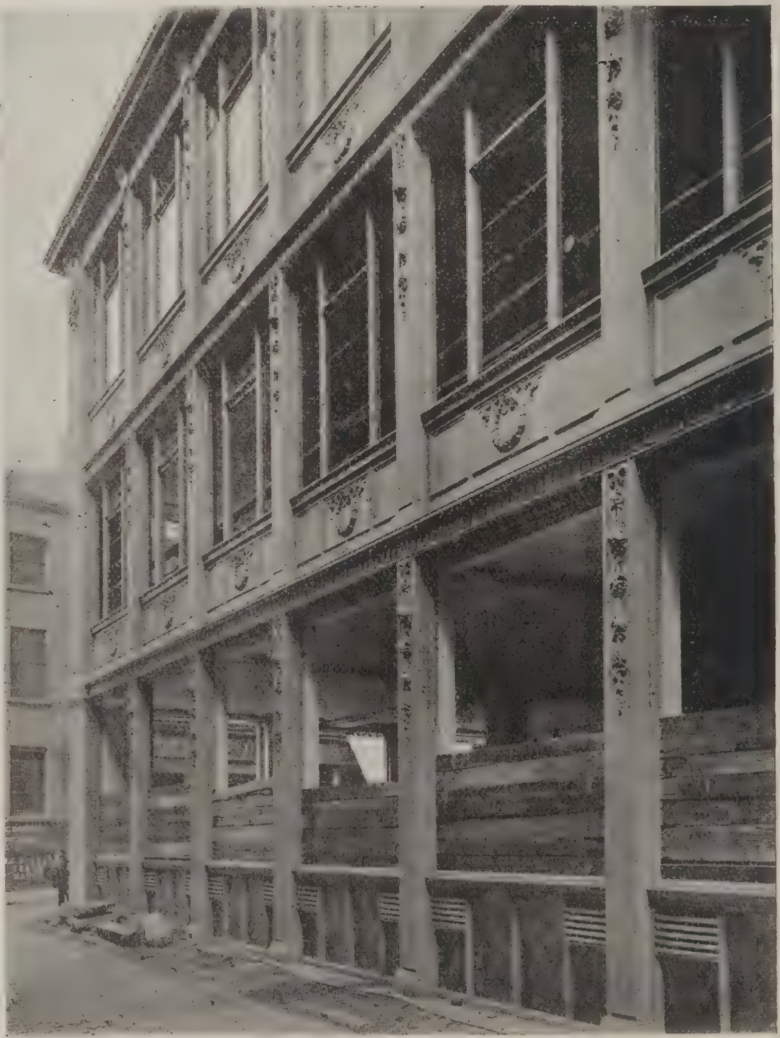
At the corner of Bold Street a branch of the North and South Wales Bank has been erected from designs by Mr. J. Francis Doyle, and another branch of the same bank in Lodge Lane from designs by Messrs. Woolfall & Eccles. Both buildings were illustrated in our issue for December 28th, 1904.

Another new bank is that for the Bank of Liverpool at the corner of Moss Street and Prescot Street. The architect was Mr. J. Francis Doyle.

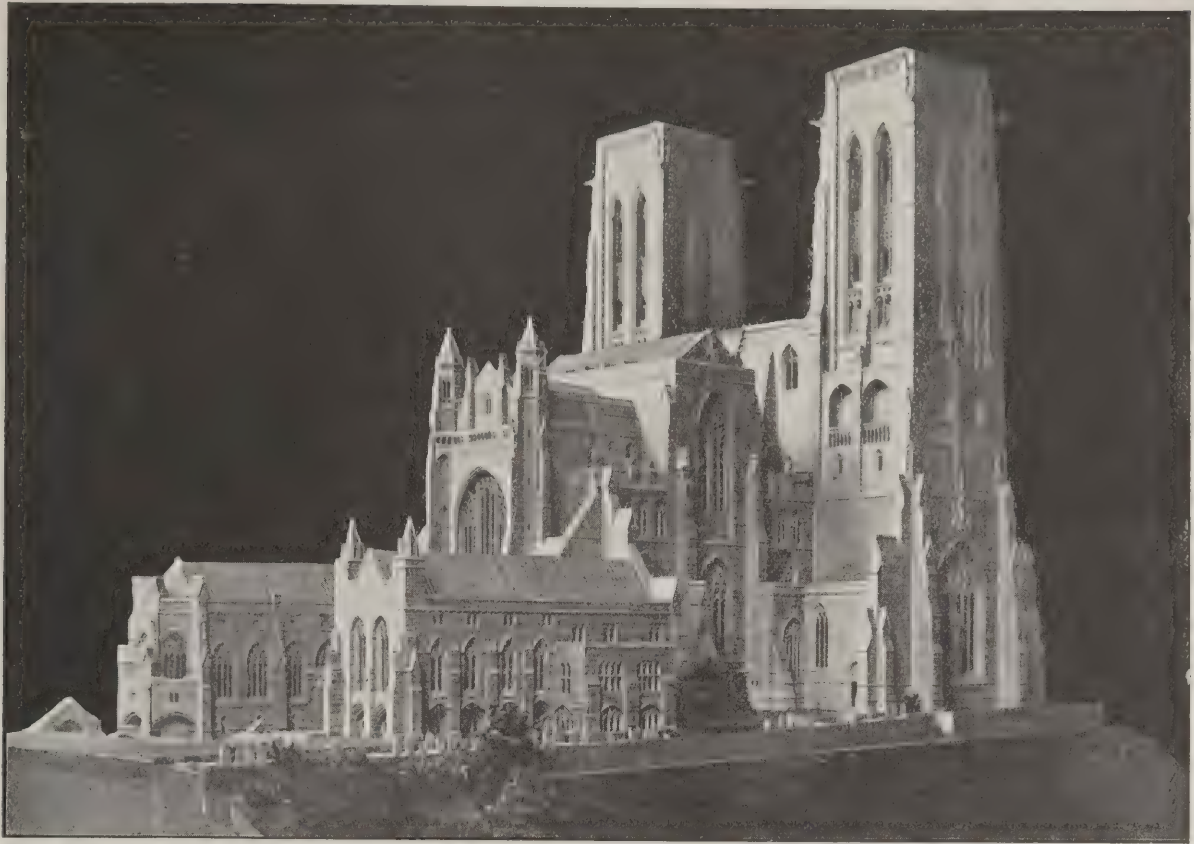
In Dale Street a new Kardomah Café has been completed. Tiles are here extensively used, the work having been carried out by Messrs. Craven, Dunnill & Co., Ltd.

A new little building of interest is that in Renshaw Street for Messrs. Quiggin Brothers, ironmongers. The architect was Mr. Henry Hartley, F.R.I.B.A., of Liverpool.

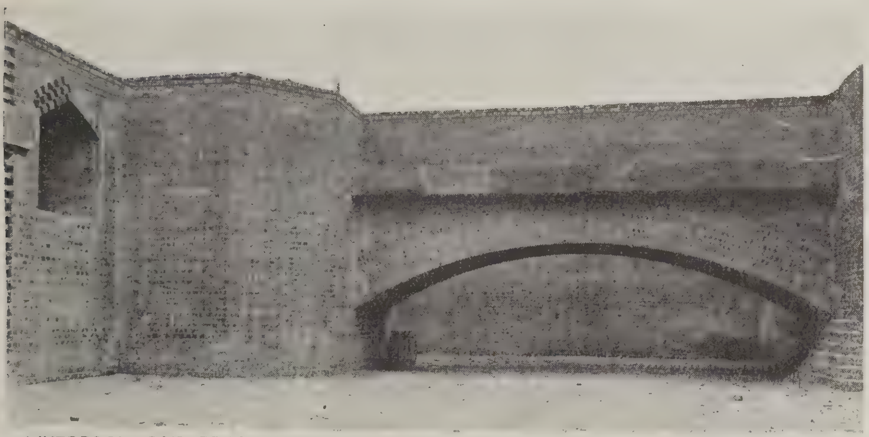
New premises in Fraser Street, off London Road, for the 8th (Scottish) Volunteer Battalion of the King's (Liverpool Regiment) have been erected from designs by Messrs. Woolfall & Eccles.



EXTENSION TO LEE'S PREMISES, HOUGHTON STREET. (Cast-Iron Work.) MATEAR & SIMON, FF.R.I.B.A., ARCHITECTS.



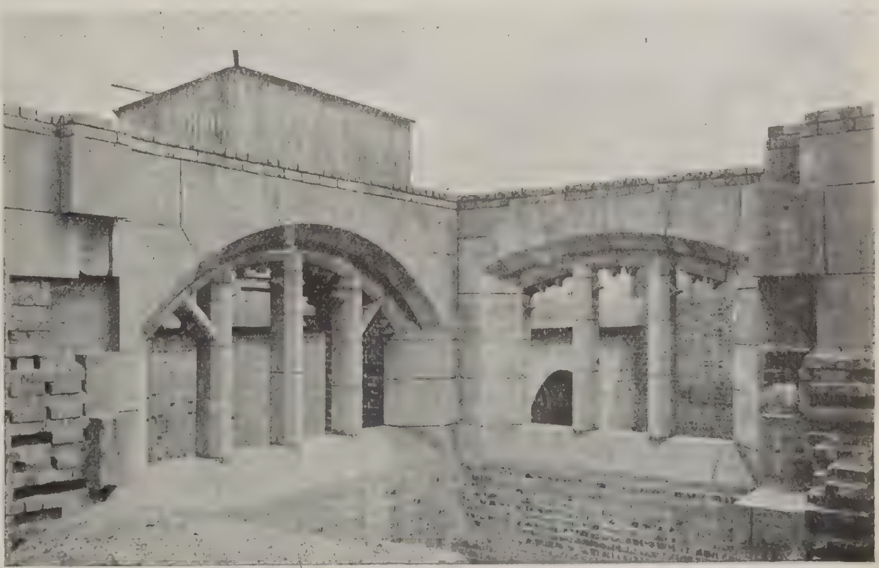
MODEL OF THE PORTION OF LIVERPOOL CATHEDRAL FIRST TO BE ERECTED.



LIVERPOOL CATHEDRAL: ARCH BETWEEN PIERS OF SOUTH TRANSEPT TOWER. SPANNING ORGAN BLOWING CHAMBER AND CARRYING PIERS BETWEEN TOWER AND AISLE.

Liverpool Cathedral.

The new cathedral at Liverpool, of course, is a most important building; but at the present moment so little of it appears above ground that there is no necessity for any detailed description of the building, to which so much attention has been given during the last two or three years. It may be mentioned, however, that the portion of the cathedral now in process of erection comprises the transepts with their twin towers, the choir, the chapter-house, vestries and Lady chapel; the nave will be built later. The first portion is estimated to cost £240,000, and the choir will not be ready for service for ten or twelve years. The Lady chapel is to be completed in four years. There is some very heavy foundation work to be seen on the site, and it is interesting to note on two completed windows lighting into an area how the cusps are worked direct on the soffit. The two twin towers are to be 260ft. high. The foundations comprise four piers, each 32ft. square at the base and tapering to 16ft. square at the top. The contractors, Messrs. Morrison & Sons, of Wavertree, are now getting into full swing. They have erected a setting-out shed 50ft. square and three pairs of saws, electrical driven, for the stonework, a 6-ton electric crane running in front to feed the saws. An electric crane running down the centre of the choir has also been erected, and four derricks (electric) are in position. A very interesting model of the portion of the building first to be completed is to be seen in the Walker Art Gallery at Liverpool. It was made by Mr. Lawrence A. Turner. For the accompanying illustration of this model we are indebted to the editor of *The West Lancashire Masonic Record.*



LIVERPOOL CATHEDRAL: WINDOWS IN AREA.
G. GILBERT SCOTT AND G. F. BODLEY, R.A., JOINT ARCHITECTS.

Notes and News

The A. A. Brown Book has just been issued.

The New Municipal Buildings at Cardiff will be opened by the Marquis of Bute on October 29th.

Mr. R. Phenè Spiers is retiring from the mastership of the Architectural School at the Royal Academy.

Mr. W. D. Caroe was sworn into the office of Master of the Worshipful Company of Plumbers on Saturday.

The Restoration of Culross Abbey is now nearing completion, and it is expected that the building will be ready for occupation next month.

Change of Address.—Mr. F. C. Moscrop-Young, architect, has moved from Waldorf Chambers, Aldwych, to 12, Buckingham Street, Strand, W.C.

Mr. Thomas Ross, of Messrs. MacGibbon & Ross, architects, Edinburgh, has been named by the late Earl of Leven and Melville in his will as the architect to have charge of the work of restoring the chapel attached to Holyrood Palace, Edinburgh. The Earl has left £40,000 for this purpose, conditional on the Government authorities employing Mr. Ross as architect.

Herculaneum, the ancient Roman city which was buried 1,800 years ago by an eruption of Vesuvius, is to be excavated by the united action of England, Germany, France, Italy, the United States, and other countries; Prof. Waldstein, of Cambridge, being the prime mover in the scheme. The town of Resina is to be bought up and demolished, and a thickness of 80ft. of earth removed.

R.I.B.A. Autumn Examinations.—The Preliminary Examination of the Royal Institute of British Architects will be held on November 5th and 6th, the Intermediate on November 5th, 6th, 8th and 9th, the Final and Special on November 15th, 16th, 17th, 19th, 20th, 22nd and 23rd; and the examinations qualifying for District Surveyor in London and Building Surveyor under Local Authorities on October 18th and 19th.

Junior Institution of Engineers.—About 100 members of this institution recently visited the Northfleet works of the Associated Portland Cement Manufacturers (1900), Ltd.. They were shown round by Mr. H. K. G. Bamber, one of the managing directors, and by members of the staff. All the processes in the manufacture of Portland cement by the most modern methods were seen in operation. Electrical power is largely employed at the works, and considerable extensions are being made.

The New Central Fire Station at Manchester was opened on Thursday last by the Lord Mayor. The total cost, including site, has been about £145,000. Messrs. Willoughby, Woodhouse & Langham were the architects. The building is carried out in vitreous terra-cotta and pressed bricks. The contractors were Messrs. J. Gerrard & Sons, Ltd. The engine-house has space for seven vehicles, and stalls for 14 horses, the exits being into Fairfield Street. Residences are provided for the officers, and there are thirty-five tenements for firemen.

The Great Wheel to be taken down.—On Monday the work of taking down the Great Wheel at Earl's Court was commenced by Mr. Walter Basset, who twelve years ago erected the wheel after his own designs at a cost of £6,000, Mr. C. F. Hitchens, civil engineer, having constructed it. The wheel rests on a bed of concrete weighing 1,100 tons. The axle weighs 53 tons and is 7ft. in diameter. It was originally intended to run lifts up to the axle to allow people to walk through it, but this part of the scheme was never carried out. The weight of the columns supporting the wheel is about 500 tons, while the wheel itself weighs about 600 tons. The disappearance of the wheel will leave only three great wheels in the world—one at Blackpool, one in Paris, and one in Vienna.

Notes on Competitions

Free Library at Hither Green.

From twelve designs for the new library to be built at Hither Green, at a cost of £4,500, the design of Mr. Hopton, of Catford, has been selected. The competition was limited to local architects.

For Canadian Architects.

A competition is being held among Canadian architects for new departmental buildings to be erected at Ottawa by the Government. There are four large premiums. The competition closes on February 15th next.

Cemetery and Caretaker's House, Stewarton.

This competition has been decided in favour of Messrs. J. and J. Armour, of Irvine, the second premium being awarded to Mr. J. Sturrock, junr., of Kilmarnock, and the third premium to Messrs. Cowan & Knox, of Glasgow.

"Architectural Review" Alphabet Competition.

The following designs in this competition were received up to and including the closing day, Monday, October 1st:—Abednego Jones, Acanthus, Alexis, Alpha I., Alpha 2, Alphomega, Arrow, Birdie, Boz (two designs), Bricks, Capstone, Classic, Crockett, Crusader, Cygnet, Delf, Einna, Eu Esperanza, Gargoyle, Grafton, Jacko (three designs), Jacobus, Kingfisher, Light, Lituus, Memory, Michael, Nimrod, Ornament, Pictorial, Pulido, Q.E.D., Red Ink, Scarab, Sol, Stan, Suggestion, T^2, Tau, Vendura, Visigoth, Wadham Whim, Wild Briony.

List of Competitions Open.

DATE OF DELIVERY	COMPETITION.
Oct. 20	SEWERAGE SCHEME FOR HIGHBRIDGE, Somerset. Premium £20. Particulars from W. C. Shier, Surveyor to the U.D.C., Highbridge.
Oct. 22	SCHOOL AT GAYWOOD, King's Lynn. Particulars from Secretary, County Education Office, 57, London Street, Norwich.
Oct. 31	BOURSE AT CAIRO.—Premiums of £E250 and £E100. International competition. Designs to be submitted to the "Corporation des Agents de Change," Cairo, Egypt.
Dec. 14	FOUNDLING HOSPITAL, MONTEVIDEO.—Four selected designs in preliminary competition to be awarded £212 each; first premium of £742 in final competition. Particulars from Consulate-General for Uruguay, 5 & 6, Clement's Inn, London, W.C.
No date	LIBRARY AT FRIBOURG, Switzerland (International competition.) Particulars from "La Direction des Travaux Publics," Fribourg.

Correspondence.

Girls' Secondary School, Aigburth Vale, Liverpool.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—The cloakroom accommodation in the above competition, which Mr. Sidney F. Harris commented on in your issue for last week, was no doubt an important point to the competitors who provided for 100 juniors and 300 seniors, while the premiated designs compromised accommodation for 200 in each cloakroom. On referring to the conditions, and also to the replies to questions, I find that these details, with many equally important, besides the general arrangement, were left "to the discretion of competitors." The conditions throughout were evidently meant to be advisory, and suggestive of what was wanted by the Education Committee. The position of the building on the site was definite, and it lay with the competitors to interpret what other points were worthy of serious consideration, or were merely a question of detail which the committee thought necessary to include in the particulars. It was a fair trial to see who could produce the best solution of a difficult problem.

All the competitors had the same difficulties, but the architect with a varied competition experience is nearly always able to get at the gist of the matter quickly, and can interpret in a broad way what the committee want, and he usually ends with a scheme which is a compromise between the printed requirements and what his professional training has taught him is a good workable, presentable and impressive idea to the eye of the assessor. For, when all is said and done, the committee do not adjudicate as a rule, but the assessor. He is the one to consider, and he generally favours the architectural side more than the whimsical fads of committees. In the case of this school, it was known that the assessor was an authority on planning, and common-sense taught the few to go strong on a well-arranged and balanced plan. No assessor of any standing would reject a good scheme simply because it departed from a few details of the conditions, or from the natural reading of the particulars. There has been no competition which the competitors have slavishly followed or shown on the plans every detail required, as the ideal plan has yet to be discovered that will suit committee, assessor, and competitors. In a nutshell, the committee in the majority of cases do not know in detail what they want—they leave that for the architects to supply, or they would not rush it into public competition. In this case the competitors, almost to a man, are satisfied with the awards of the assessor.—Yours truly,

Liverpool. W. EDWARDES SPROAT.

Obituary.

Mr. Charles Long, of the firm of Messrs. Wylson & Long, theatre architects, London, died recently,

The late Mr. E. E. Scrivener, of the firm of R. Scrivener & Sons, architects, Shelton, left estate which has been valued at £13,191 nett.

Mr. J. A. Webster, head of the firm of Webster and Cannon, contractors and builders, of Aylesbury, died on Monday, last week. His firm has carried out some large Government contracts.

Complete List of Contracts Open.

WITH a few exceptions, news of Contracts Open are not repeated after they have been published once in these columns, so that readers will find particulars in our previous issues of other contracts that still remain open.

Unless expressly stated to the contrary, all deposits required for bills of quantities, &c., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair-wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

Oct. 4. Manchester.—*Erection of Telegraph Office, &c.*, at Ancoats Goods Depot, Manchester, for the Directors of the Midland Railway Co. Plans and specifications may be seen, quantities and particulars obtained on application at the Engineer's Office, Derby Station. Sealed tenders to be forwarded by post to the Secretary of the Way and Works Committee, Midland Railway, Derby, not later than 9 a.m. on Oct. 4.

Oct. 4. Lyminge.—*Erection of a chimney shaft* and alterations to a boiler house at the workhouse, Lyminge. Also separate tender for taking out two boilers and fixing two other boilers and an economiser. Plans and specifications can be seen of R. Lonergan, clerk, 41, Cheriton Place, Folkestone, between 10 and 5 o'clock, except on Saturday, when they can be seen between 10 and 1 p.m. Tenders to be delivered to the clerk before Oct. 4.

Oct. 4. Chester-le-Street.—*Excavating, concrete foundations, brickwork, &c.*, required in extending the arch of West Pelton Road Bridge, Grange Villa, near Chester-le-Street. Span 13ft. 6in., length 50ft. Plans and specifications may be seen and form of tender and schedule of quantities obtained at the office of G. W. Ayton, highway surveyor, Chester-le-Street, any day between the hours of 9 a.m. and 5 p.m. Tenders, endorsed "Tender for Bridge Extension," to be sent to the Surveyor not later than the first post on Oct. 4.

Oct. 4. Levenshulme.—*Erection and completion of the new technical school* proposed to be erected at the rear of the Chapel Street Council School, Chapel Street, Levenshulme. Specifications, bills of quantities and further particulars may be obtained on application to H. Littler, architect, 16, Ribblesdale Place, Preston, on payment of £3 3s. Tenders, endorsed "Tender for New Technical School," to be sent to J. O. Hardicker, clerk, Northern Assurance Buildings, Albert Square, Manchester, on or before Oct. 4.

Oct. 6. Chelmsford.—*Erection of an applied art room* at the New Library Buildings, Market Road, Chelmsford, for the committee. Persons desirous of tendering can inspect the plans and specification at the offices of Chancellor & Son, Duke Street, Chelmsford, to whom tenders are to be sent on or before 10 a.m. on Oct. 6.

Oct. 6. Cwm.—*Erection of new Baptist Chapel*, Cwm. Drawings and specifications may be seen at the office of N. G. Lewis, F.I.A.S., architect and surveyor, Oak Street, Abertillery. Tenders, endorsed "New Chapel, Cwm," to be in the hands of the Secretary, H. Howells, 9, Railway View, Cwm, Mon., by noon, Oct. 6.

Oct. 6. Walton-on-Thames.—*Works of repairs and painting, &c.*, at the Weylands Sewage Works, Molesey Road, Walton-on-Thames, for the U.D.C. The specification may be seen, and forms of tender obtained on application at the Engineer and Surveyor's Office, Walton-on-Thames, during the usual Office hours. Tenders, sealed and endorsed "Tender for Painting," must be delivered to R. Wilds, not later than 12 a.m. on Oct. 9.

Oct. 6. East Meon.—*Two cottage dwelling houses to be erected at East Meon* for the Trustees of the Forbes Almshouses, East Meon, Petersfield. Plans and specifications may be seen at the Church Institute between the hours of 9 a.m. and 4 p.m. during the fortnight commencing Sept. 21, on application to H. Coles, churchwarden. All tenders must be sent to Bucknall & Comper, architects, 123, Knights Hill Road, West Norwood, London, S.E., by Oct. 6.

Oct. 6. St. Dennis, Cornwall.—*Erection and completion of a New Bible Christian Chapel* at Enniscaven, St. Dennis, Cornwall. Plans and Specifications may be seen on application to J. Docking, Enniscaven. For further particulars apply at the office of F. C. Jury, architect, No. 1, Alma Villas, Tregonissey Road, St. Austell. Tenders, sealed and endorsed "New Chapel Tenders," must be sent to the Rev. T. Spillett, The Manse, St. Columb, on or before Oct. 6.

Oct. 6. Deal.—*Erection of a new school*, to accommodate 240 infants, together with boundary walls and other site works, at Deal. The drawings and specification may be inspected at the office of Chas. L. Crowther, architect, Queen Street, Deal, from whom also a copy of the bills of quantities may be obtained upon payment of a deposit of £1 1s. Tenders on the form and in the envelope supplied, to be delivered to F. C. Brown, clerk to the Committee, High Street, Deal, not later than Oct. 6.

Oct. 6. Reddish.—*Erection of public baths, fire station and free library* in Gorton Road, Reddish. The plans, drawings, specification and general conditions may be inspected and a form of tender obtained at the office of Dixon & Potter, architects, 65, King Street, Manchester, and quantities will be supplied by them on payment of a deposit of £2 2s. Sealed tenders, endorsed "Reddish Baths Contract," must be delivered to R. Hyde, town clerk, Town Clerk's Office, Stockport, not later than 12 o'clock noon on Oct. 6. (Fair wages clause.)

Oct. 8. Plymouth.—*Erection of school buildings* at Prince Rock. Persons desirous of tendering are requested to forward their names to Thorneley & Rooke, architects, 11, The Crescent, Plymouth, on or before Oct. 8.

Oct. 8. Skewen, Neath.—*Erection of Congregational Chapel*, at Skewan, Neath. Plans, specifications, &c., can be seen at the office of Lloyd & Martyn, architects, Dynevor Post Office, Skewen, upon payment of £1 1s. Endorsed tenders to be sent on or before Oct. 8.

Oct. 8. Durham.—*Erection of a Nurses' Home*, for the Visiting Committee of the Durham County Asylum. Plans and conditions of contract may be seen and bills of quantities obtained at the office of W. Crozier, A.M.I.C.E., county architect, Shire Hall, Durham, to whom sealed tenders are to be delivered not later than 1 p.m. on Oct. 8, endorsed "Tender for Nurses' Home."

Oct. 8. Selly Oak.—*Erection of a movable wooden floor over the men's swimming bath at the Baths, Tiverton Road, Selly Oak*, for the King's Norton and Northfield U.D.C. Forms of tender can be obtained and plans and specifications seen at the offices of E. Docker, clerk to the Council, 19, Newhall Street, Birmingham, to whom sealed tenders, endorsed "Tender for Movable Foor," must be delivered not later than 12 o'clock noon on Oct. 8.

Oct. 8. Carrick-on-Shannon.—*New Crown Post Office* at Carrick-on-Shannon County Leitrim. Tenders will be received up to but not later than 10 a.m. on Oct. 8, by H. Williams, Secretary, Office of Public Works, Dublin. The plans and specification can be seen at the Post Office, Carrick-on-Shannon. Forms of tender and bills of quantities will be supplied on deposit of £1, The separate envelopes containing the tender and the bill of quantities must be endorsed. The accuracy of the quantities is not guaranteed.

Oct. 9. Tynemouth.—*Erection of laundry disinfector, stables, and ambulance buildings* at Moor Park Hospital. Plans and specification may be seen at the office of J. F. Smillie, borough surveyor, to whom sealed tenders and endorsed tenders are to be delivered not later than 10 a.m. on Oct. 9.

Oct. 9. Dublin.—*Erection and completion of a gymnasium* at the Royal Hibernian Military School, Phœnix Park. Tenders will be received up to but not later than 10 a.m. on Oct. 9. The plans and specification can be seen of H. Williams, secretary, Office of Public Works, Dublin. Forms of tender and bills of quantities will be supplied on deposit of £1. The separate envelopes containing the tender and the bill of quantities must be endorsed.

Oct. 9. London, E.—*Demolition and removal of materials and clearing of site of old houses* (Nos. 501-519 odd inclusive, High Street, North East Ham, situate between Cranbourne Road on the south and Romford Road on the north, all in accordance with specification and general conditions of contract, which may be seen, and copies of tender obtained, on application to A. H. Campbell, M.I.C.E., borough engineer, Town Hall, East Ham. Tenders to be delivered, addressed to "The Chairman of the Works Committee, Town Hall, East Ham, E.," not later than 12 o'clock noon on Oct. 9, and endorsed "Demolition of Old Buildings."

Oct. 10. Hull.—*Erection of horse stables and two cottages* at Hedon Road, Hull. Plans and specification may be seen upon application to Clerk of Works' Office, Paragon Station, Hull, and quantities and further information obtained from W. Bell, the company's architect, at York. Quantities supplied on personal application to parties tendering for the whole of the works, Sealed tenders, marked "Stables, Hedon Road, Hull," to be sent to R. F. Dunnell, secretary, at York, not later than noon on Oct. 10.

Oct. 10. Bangour.—*Erection of Recreation Hall* at Bangour Village, for the Edinburgh and District Board of Lunacy. The relative schedules for the masonry, steel, and iron, plumber, plaster, slater, and glazier works obtained on application to H. J. Blanc, R.S.A., architect 25, Rutland Square, Edinburgh. where the specification, plans, and the general conditions of contract will be exhibited. The schedules shall be priced and extended, and lodged with J. Kyd, clerk and treasurer, Chambers of District Board, Castle Terrace, Edinburgh. not later than Oct. 10, along with the tender, each enclosed in a separate cover, to be supplied. All the documents issued must be returned with the tender.

Oct. 11. King's Lynn.—1. *Cleaning and washing down kitchen walls and ceiling.* 2. Cleaning, colouring and painting upper ward and staircase male infirmary, for the King's Lynn Union. Specifications to be seen at the Workhouse. Tenders to be sent to R. C. Coulton, clerk to the Guardians, Lynn, on or before Oct. 11.

Oct. 11. Belfast.—*Construction of an underground convenience* in Donegall Square North, for the Police Committee of the County Borough of Belfast. Drawings, specification, and form of tender may be obtained in the City Surveyor's office on payment of £1 1s. Tenders endorsed "Underground Convenience," to be lodged at the office of S. Black, town clerk, before 10 o'clock on Oct. 11.

Oct. 11. Monaghan.—*Erection of a boundary wall* in accordance with plan and specification, which may be seen at the Board-room of the Monaghan Asylum, between the hours of 10 a.m. and 5 o'clock p.m. on any week day. Tenders to be forwarded by registered post, endorsed "Tender for Boundary Wall." Tenders to state the names of two solvent securities who will be prepared to enter into a bond conditioned for the due fulfilment and for the completion of the contract by such date as the Committee may determine. Tenders will be opened and considered at the meeting of the Joint Committee of the Monaghan Asylum on Oct. 11.

Oct. 11. London, S.E.—*Carrying out of extensions and alterations of the Council's baths and washhouses*, Kennington Road. Plans can be seen and specifications and bill of quantities obtained on deposit of a sum of £1 1s., at the offices of the borough engineer, H. C. J. Edwards, C.E., 345, Kennington Road, S.E., between the hours of 10 a.m. and 12 noon and 2 p.m. and 4 p.m. (Saturdays excepted). Sealed tenders, endorsed "Tenders for Building Work, Kennington Baths," to be delivered to H. J. Smith, town clerk, Town Hall, Kennington Green, S.E., not later than 12 o'clock noon on Oct. 11.

Oct. 12. Monkwearmouth.—*Erection of a factory, offices, &c.*, near Fulwell Road, Monkwearmouth, for Messrs. D. H. & G. Haggie. Plans and specifications can be seen and all particulars learned at the offices of J. Potts & Son, architects and surveyors, 57, John Street, Sunderland, and quantities can be obtained on the payment of £3 3s. Tenders to be sealed, endorsed, and delivered to the architects not later than Oct. 12.

Oct. 12. Newport.—*Erection of new infirmary buildings* adjoining the workhouse for the Guardians of the Newport(Salop)Union. Plans and specifications can be seen, and bills of quantities and forms of tender obtained, on application to Fleeming & Son, architects, Bank Chambers, Wellington, Salop. The sum of £1 1s. will be charged for copy of bills of quantities. Tenders must be delivered to R. P. Liddle, clerk to the Guardians, Newport, not later than 9 o'clock a.m. on Oct. 12.

Oct. 13. Bridgend.—*Erecting a Mortuary, &c.*, at the Bridgend and Cowbridge Workhouse. Plans, &c., may be seen, and all particulars obtained, at the office of P. J. Thomas, architect, Bridgend. Tenders endorsed "Mortuary," to be received by R. Harmar Cox, clerk, Union Offices, Bridgend, before Oct. 13.

Oct. 13. Aberystwyth.—*Erection of proposed new villa* in Benadl Road, Buarth, Aberystwyth, for W. James, Esq., Blaengarw, South Wales. Plans and specifications may be seen of J. Lewis-Evans, architect and surveyor, 21, Great Darkgate Street, where sealed tenders are to be sent not later than noon Oct. 13.

Oct. 13. London, W.—*Pulling down of the existing brick-arched carriageway bridge* over the canal, and the construction and erection of a new brick, concrete, and steel carriageway bridge (30ft. span), a new tollkeeper's office, and the execution of certain works appurtenant thereto, all in and about Warwick Avenue. Contract No. 1.—Building constructional works, &c. Contract No. 2.—Steelwork, &c. Contract No. 3.—Nos. 1 and 2 together. Forms of tender, general conditions, specifications, and bills of quantities will be furnished upon application to E. B. B. Newton, Assoc.M.Inst.C.E., F.S.I., borough surveyor, Paddington, W., after payment to the Borough Accountant of £1 for a set containing one copy for each document. Further particulars may be obtained, and the drawings seen, on application at the Borough Surveyor's Office between the hours of 10 a.m. and 4 p.m. (Saturdays, 10 a.m. and 1 p.m.), or on written inquiry to the Borough Surveyor and the receipt by him of stamped addressed envelope for reply. Tenders must be sent in sealed and endorsed "Reconstruction of Warwick Avenue Bridge," "No. 1, Building Constructional Works," "No. 2, Steelwork," or "No. 3, Nos. 1 and 2 together," directed to the Town Clerk, and delivered at his office, Town Hall, Paddington, W., not later than Oct. 13, after which no tender will be received.

Oct. 16. Durham.—*Alterations to Wolviston Council School.* Plans, specifications, and conditions of contract may be seen at the school and the architect's office Quantities may be obtained on application to the architect. Sealed, endorsed tenders to be delivered to W. Rushworth, F.R.I.B.A., architect, County Education Offices, Shire Hall, Durham, not later than Oct. 16.

Oct. 16, Barry.—*Alterations and additions to the High Street Old Boys' and Infants' Schools, Barry.* Plans and specifications can be seen at the office of G. A. Birkenhead, architect, Caledonian Chambers, St. Mary Street, Cardiff, and 21, Park Avenue, Barry, from whom bills of quantities can be obtained on payment of £2 2s. The bill of quantities must be sent in under separate cover with the name of the person tendering on the outside. The tenders to be sent, sealed and endorsed, to T. B. Tordoff, clerk, Council Offices, Barry, before 5 o'clock on Oct. 16.

Oct. 16. London, E.C. — *Alterations and additions to the underground conveniences* in Bishopsgate Street Without and Aldgate, according to drawings and specifications to be seen at the office of the engineer to the Corporation, Guildhall, between the hours of 10 a.m. and 5 p.m., and bills of quantities and forms of tender may be obtained on payment of £1. Tenders on the before-mentioned forms must be addressed Town Clerk, Public Health Department, Guildhall, E.C., endorsed "Underground Conveniences," and delivered at the office of the hallkeeper, Guildhall, between the hours of 12.30 and 1.30 p.m., on or before Oct. 16, when the Streets Committee of the Corporation of London will meet at the Guildhall at 1.30 o'clock to receive tenders.

Oct. 17. Cleethorpes. — *Erection of an elementary school* in Elliston Street, Cleethorpes. for the Lindsey County Council Education Committee Bills of quantities and form of tender may be had on application to Scorer & Gamble, architects, Bank Street Chambers, Lincoln, on payment to them of £2 2s. The drawings and conditions of contract may be inspected at the offices of the architects. Tenders must be delivered to S. M. Grant, secretary, 286, High Street, Lincoln, in the envelope provided for that purpose, before 10 a.m. on Oct. 17.

Oct. 20. Haverfordwest.—*Reconstruction of the meat market*, including new steel roof with elliptical lattice-braced principals, &c. The drawings and specifications may be inspected at the Council Chamber, High Street, Haverfordwest, between 10 a.m. and 5 p.m.

or at the office of J. Preece James, architect, Tenby. A deposit of £2 2s. will be required. Tenders, sealed and endorsed "Reconstruction of Market," on the forms supplied, are to be sent to R. T. P. Williams, town clerk, Haverfordwest, on or before Oct. 20.

Oct. 22. Mold.—*Erection and carrying out of the following works* for the Flintshire Educational Committee:—(*a*) The erection of a new school for 300 infants at Golftyn, Connah's Quay. (*b*) The erection of a new school for 300 infants at Custom House Lane, Connah's Quay. (*c*) Certain alterations and additions at the Abermorddu Council School, near Wrexham. Plans can be seen and specifications, bills of quantities, and form of tender can be obtained at the office of S. Evans, county surveyor, County Buildings, Mold, between the hours of 10 a.m. and 5 p.m. on payment of £2 2s. Tenders, duly made on the prescribed forms and enclosed in an envelope, which will be supplied, must be delivered at the County Education Offices, Mold, not later than the first post on Oct. 22.

Oct. 30. Manchester.—*Erection of the Oswald Road Municipal School*, Chorlton-cum-Hardy, Manchester. Plans may be seen, and a copy of the bills of quantities (including specification) obtained at the Education Offices, Deansgate, Manchester, on a deposit of £2 2s. Tenders, on the official forms, and enclosed in the envelopes provided, must be delivered not later than Oct. 30. Cheques to be made payable to the Accountant, Education Offices, Deansgate, Manchester.

No date. Kilkeel, Co. Down.—*Erection of four dwellinghouses* in Kilkeel, Co. Down, for Mr. Hugh O'Neill. For particulars apply to E. C. Page, architect, Kilkeel.

ENGINEERING.

Oct. 10. Brussels.—*Construction of a section of the railway from Hannut to Huccorgne on the local railways from Hannut to Vinalmont and Burdinne to Huy.* The estimated cost of the work is 287,500fr. (£11,500), and a deposit of 29,000fr. (£1,160) is required to qualify any tender. Tenders by registered letter will be received at the "Société nationale des chemins de fer vicinaux" offices, 14 Rue de la Science, Brussels, not later than Oct. 9. A copy of the specifications may be obtained on payment of 1fr. from M. Mahieu, Rue du Moulin, No. 3, Waremme.

Oct. 13. London, S.W.—*Supply, delivery, and fixing complete* at the depot, Queen's Road, Wimbledon, of a circular saw bench, band sawing machine, and a 12-h.p. electrical motor for driving same. Particulars may be obtained on application to the Borough Engineer and Surveyor, Town Hall, Wimbledon. Sealed tenders, endorsed "Wood-cutting Machinery," to be delivery at the Town Hall on or before noon on Oct. 13.

Oct. 13. Newport.—*Supply of the following apparatus* for the Electricity and Tramways Department:—1. Three feeder boosters, one balancer, one electrically driven feed pump, one electrically driven two throw pump. 2. Switchboards and instruments. Specifications and forms of tender may be obtained on application to H. Collings Bishop, borough electrical engineer and tramways manager, Electricity and Tramways Department, Town Hall, Newport, Mon. Plans relating to switchboards may be inspected at the Electricity Offices, Town Hall, and copies of these plans may be obtained for the sum of 2s. 6d. Spare copies of the specification may be had on payment of 2s. 6d. A deposit of £2 2s. is required when application for specification is made. Tenders to be delivered to the Town Clerk, sealed in the envelopes provided, not later than Oct. 13.

Oct. 15. Coventry.—*Manufacture, supply and erection* for the Gas Committee, at their Foleshill Works, of the hydraulic plant:—Two wagon tipping machines, one direct acting hydraulic lift, two 1-ton capstans and snatch heads, one set of high-pressure steam pumps, one accummulator, &c., connecting pipes, valves, &c. Drawings, specification, and form of tender may be obtained on payment of £1 1s. Sealed tenders, addressed to the Chairman of the Gas Comittee, Gasworks, Coventry, endorsed "Tender for Hydraulic Plant," must be delivered not later than 9 a.m., Oct. 15.

Oct. 15. Coventry.—*Manufacture, supply, and erection, at the Foleshill Works* of the Gas Committee, of the following coal-conveying plant: Two gravity bucket conveyors, each about 830ft. long and capacity of 40 tons per hour; two short tray conveyors, each about 36ft. long and similar capacity; one large 4-roll coal breaker of capacity of 60 tons large coal per hour: high-pressure steam engines, for driving the breaker and conveyors; one 15-ton capacity receiving hopper, together with steel work, &c., for carrying breaker, &c. Drawings, specification and form of tender may be obtained of F. W. Stevenson, general manager, Gas Works, Coventry, on payment of £1 1s. Sealed tenders addreised to the Chairman, Gas Works, Coventry, endorsed "Tender for Coal Conveyors," &c., must be delivered not later than 9 a.m on Oct. 1.

Oct. 20. Wellingborough.—*Pumping machinery, gas engine, and suction gas plant* required for the Wellingborough U.D.C. pumping station at the Bushfields Waterworks. Plans and specifications may be obtained at the office of E. Y. Harrison, M.I.C.E., surveyor and water engineer, Park Road, Wellingborough, on payment of a deposit of £2 2s. Sealed tenders, on the prescribed form, endorsed "Tender for Pumping Machinery," to be delivered to Mr. Harrison by noon on Oct, 20.

Oct. 31. Zagazig.—*Installation of a supply of drinking water in the town of Zagazig*, in accordance with plans and specifications to be seen at the Ministry of the Interior. Tenders made out on stamped paper, obtainable from Lieut.-Col. Western, R.E., C.M.G., Queen Anne's Chambers, Westminster, S.W., and marked "Offre pour les travaux d'installation d'eau à Zagazig," should be addressed to "S. E. le Sous-Sécrétaire d'Etat, Ministère de l'Intérieure, Cairo," where they will be received up to Oct. 31. A deposit of 10 per cent. of the estimate is required to qualify any tender. Conditions of tender, together with lists of the materials and machinery required may be seen at the Commercial Intelligence Branch of the Board of Trade, 73, Basinghall Street, E.C.

Nov. 3. Shanghai.—*Construction and erection of two steel girder bridges across the Soochow Creek to replace the present Garden Bridge and Chekiang Road Bridge.* The Garden Bridge will consist of two spans, each of 171 feet and having a width of 60 feet between the parapets. The Chekiang Road Bridge will be one span of 196ft. with a width of 40ft. between parapets. General conditions, specifications, drawings, forms of tender, and all other information may be obtained at the office of Charles Mayne, M.Inst.C.E., municipal engineer, No. 15, Hankow Road. A charge of Tls. 100 will be made for the specification and set of drawings. Sealed tenders, separately for each bridge, and endorsed "Garden Bridge," or "Chekiang Road Bridge," will be received by W. E. Leveson, secretary, Council Room, Shanghai, not later than noon on Nov. 3.

Nov. 6. Madrid.—*Construction and working of a railway between Ferrol and Betanzos*, in accordance with conditions set forth in the "Gaceta de Madrid" of August 7. A Government subsidy of 3,054,508 pesetas (about £109,284), payable in eight annual instalments, will be granted to the concessionnaire. All materials imported for the construction of the line and for its working during the first 10 years will be exempted from import duties. A deposit of 145,259 pesetes (about £5,196) is required to qualify any tender. Tenders will be opened on Nov. 6 at the Directorate General of Public Works, Madrid.

March 18, 1907. New Zealand.—*Construction of a tunnel*, about 5 miles 25 chains in length, at Arthur's Pass, through the dividing range between Canterbury and Westland, on the route of the New Zealand Midland Railway. Tenders are to be addressed to the High Commissioner for New Zealand, 13, Victoria Street, Westminster, S.W., and maked on the outside "Tender for Arthur's Pass Tunnel—60 months (or 48 months)." Tenders will be received up till noon of March 18, 1907. Specification, conditions, tender forms and other information may be obtained on application to the High Commissioner upon payment of a deposit of £10. Plans can also be inspected at the High Commissioner's Office.

IRON AND STEEL.

Oct. 8. Kingswinford.—*Supply and delivery on the works, as may be required, of about 715 tons of cast-iron pipes*, varying in size from 16ins. to 27ins. in diameter, for the Kingswinford R.D.C. Plans, detailed drawings, and form of contract may be seen, and specifications, schedules, and bills of quantities obtained at the offices of W. Fiddian, F.S.I., engineer, Old Bank Offices, Stourbridge, on payment of £2 2s. Two sureties will be required for the due performance of the contract. Sealed tenders, endorsed "Tender for Kingswinford Sewerage Contract No. 9," to be sent to G. F. James, clerk to the Council, the Council Offices, Wordsley Stourbridge, not later than noon Oct. 8.

Oct. 16. Adelaide, S. Australia.—*Supply and delivery of 112 tons steel deep fishplates*, for 61lb. rails, in bond on trucks, Ocean Steamers Wharf, Port Adelaide (wharfage to be paid by the contractor). Specification and drawing can be seen and forms of tender obtained at the Supply and Tender Board Office, Victoria Square, Adelaide, where copies of the same may also be purchased, price 5s. No tender will be recognised unless on the proper printed form, and a time must be quoted for shipment. Tenders should be endorsed "Tender for deep fishplates, 61lb." The successful tenderer will be required, within seven days of the notice of acceptance, to make a deposit equal to 5 per cent. of the total value of the accepted tender as security for due fulfilment of contract. Tenders will be received at the above office up to 3 p.m. on Oct. 16.

PAINTING & PLUMBING.

Oct. 4. Sunderland.—*Outside painting, &c., of Harrison's Buildings*, Hat Case Area. Specifications may be seen and form of tender obtained at the Borough Surveyor's Office, Town Hall. Sealed tenders addressed "To the Chairman of the Health Committee," and endorsed "Tender for Painting, &c., Harrison's Buildings, Hat Case Area," must be delivered at the Town Clerk's Office, Town Hall, before 12 o'clock noon, on Oct. 4.

Oct. 6. Chelmsford.—*Painting and other work* to the new Head Quarters, Springfields, Chelmsford, for the Standing Joint Committee of the Court of Quarter Sessions, &c. Specification can be seen at the office of F. Whitmore, county architect, 73, Duke Street, Chelmsford, any working day, except Saturday, between the hours of ten and four. Sealed Tenders, endorsed "Tender for Painting, etc., New Head Quarters, Springfield," must be addressed and delivered to F. Whitmore, not later than Oct. 6.

Oct. 8. Dublin.—*Painting of the following girder bridges*, for the directors of the Great Northern Railway Co. (Ireland):—1. The Carrickmacross Road Bridge at Dundalk Station. 2. Ardee Road Bridge over Barrack Street branch at Rail Yard, Dundalk. 3. Hill Street Bridge, Dundalk. 4. Underline Bridge on Howth tramway (G.N.R. [I.]), at Howth Station. Parties wishing to tender can see the specification at the office of W. H. Mills, engineer-in chief, Amiens Street Terminus, Dublin, or copy thereof at office of the district engineer, Belfast; and forms of tender can be obtained at either of the above-mentioned places on payment of 1s. each. Tenders, made out separately for each of the four contracts and on the forms supplied by the company, endorsed "Tender for Painting," should be lodged with T. Morrison, secretary, Secretary's Office, Amiens Street Terminus, Dublin, not later than 10 a.m. on Oct. 8.

Oct. 10. Derby.—*Painting at the Markeaton, Mundy, and Little Chester Recreation Grounds.* Specification may be seen and particulars obtained on application to J. Ward, M.Inst.C E., borough surveyor, Borough Surveyor's Office, Babington Lane, Derby. Tenders endorsed "Painting at Recreation Grounds," to be sent to the Town Clerk, 15, Tenant Street, Derby, not later than noon on Oct. 10.

Oct. 10. Scarborough.—*Painting all the outside wood and ironwork* of the Workhouse, Infirmary, Outbuildings, and Poor Law Offices. Further particulars may be had on application to Mr Metcalf, the Workhouse master. Tenders under seal to be sent in to F. H. Read, clerk, 26a, Dean Street, Scarborough, on or before Oct. 10.

Oct. 16. Barry.—*Plumbing in connection with alterations to the High Street Old Boys and Infants' Schools, Barry*, for the U.D.C. Plans and specifications can be seen at the offices of G. A. Birkenhead, architect, Caledonian Chambers, St. Mary Street, Cardiff, and 21, Park Avenue, Barry, from whom bills of quantities can be obtained on payment of £1 1s. The bill of quantities must be sent in under separate cover, with the name of the pérson tendering on the outside. The tenders to be sent in, sealed and endorsed, to T. B. Tordoff, clerk, Council Offices, Barry, before five o'clock on Oct. 16.

ROADS AND CARTAGE.

Oct. 4. Woolston.—*Providing and laying complete, Coverack syenitic concrete paving* in four roads in Woolston, near Southampton, for the Itchen U.D.C. Plans and particulars may be seen between the hours of 10 a.m. and 11 a.m. at the Council's Surveyor's office, Portsmouth Road, Woolston, from whom further information may be obtained. Sealed tenders, endorsed "Tender for Paving," to be sent to W. Henry Bell, clerk to the Council, Bridge Road, Woolston, near Southampton, on or before 12 o'clock noon on Oct. 4.

Oct. 5. Raunds.—*Hire per day of steam roller, scarifier and driver*, for the U.D.C. Particulars can be obtained of the Council's surveyor, T. Yorke, Raunds. Tenders to be sent in to W. F. Corby, clerk, not later than Oct. 5.

Oct. 6. Leeds.—*Paving and flagging* the following streets:—Elmfield Street, Elmfield Avenue, Elmfield Road, Colmore Street, Elmfield Terrace, Elmfield Grove, Elmfield Place, Hardrow Terrace, Hardrow Grove, Colmore Road, Colmore Place, Lewis Avenue, Highfield Grove, Highfield Crescent and Colmore Grove. Drawings may be seen at the City Engineer's Office, Municipal Buildings. Forms of tender and bills of quantities may be obtained, and copies of the documents forming the contract inspected, on application at the Highways Office, 155, Kirkstall Road. Sealed tenders, endorsed "Tender for Private Street Works," and addressed to the Highways Committee, must be delivered at the Town Clerk's Office, Town Hall, Leeds, not later than 10 a.m. on Oct. 6.

Oct. 8. Camberwell.—*Kerbing, channelling, foundations for asphalt paving*, road work, and drainage work in Royal Oak Place, Forest Hill Road. Specification and form of tender can be obtained from W. Oxtoby, borough engineer, Town Hall; and tenders must be delivered on or before Oct. 8, not later than 6.30 p.m.

Oct. 8. Skipton.—*Excavating, paving, and completing of the pavements* in High Street, Skipton, for the U.D.C. Plans and specifications may be seen and schedule of quantities obtained on application to J. Mallinson, engineer and surveyor to the Council, Town Hall, Skipton, on payment of £1. Sealed tenders, endorsed "High Street Improvement," are to be sent to him not later than Oct. 8.

Oct. 8. Broadstairs.—*Steam rolling and scarifying* required in connection with the repair of roads within the district for the ensuing twelve months, for the Broadstairs and St. Peter's U.D.C. Further particulars and form of tender may be obtained on application to H. Hurd, C.E., town surveyor, Broadstairs. Sealed tenders, endorsed "Steam Rolling and Scarifying," must be delivered to L. A. Skinner, clerk of the Council, Council Offices, Broadstairs, by 12 noon on Oct. 8.

Oct. 8. Bury.—*Surface-water draining, forming, ballasting, kerbing, flagging, and paving* for a length of 230yds. or thereabouts, for the R.D.C., at the Private Improvement Works, Prestolee, Outwood. Plans, sections, and specifications can be seen and quantities obtained upon payment of £2 2s., at the Union Offices, Bury. Tenders to be endorsed "Private Street Improvement Works," and delivered to J. Isherwood, solicitor, clerk to the Council, Union Offices, Bury, before 10 o'clock on Oct. 8.

Oct. 8. Sevenoaks.—*Supply of 800 tons (more or less) of granite or quartzite*, broken to a gauge of 2ins. for the U.D.C. Forms of tender (on which alone tenders must be made), with specification and conditions, may be obtained of S. Towlson, A.M.I.C.E., surveyor to the Council, Argyle Road, Sevenoaks, to whom a sample of the granite or quartzite tendered for must be delivered, free of cost, to the Council not later than Oct. 8. Sealed tenders, addressed to H. J. Thompson, clerk to the Council, U.D.C. Offices, Sevenoaks, endorsed "Tender for Granite" or "Quartzite," to be delivered not later than Oct. 8.

Oct. 8. Salisbury.—*Reconstruction and widening of St. Mark's Avenue*, the construction of sewers, surface-water drains, manholes, gullies, and other works incidental thereto for and on behalf of the Ecclesiastical Commissioners for England and their surveyors, Messrs. Clutton, 5, Great College Street, Westminster Abbey, London, S.W. Plans, specification, and conditions of contract, prepared by Lemon & Blizard, MM.Inst.C.E., engineers for the works, may be inspected at their Salisbury office, and copies of bills of quantities obtained on depositing the sum of £2 2s. Sealed tenders to be sent to the engineers' office, 29, Market Place, Salisbury, on or before Oct. 8, before 5 p.m.

Oct. 8. Kibworth Beauchamp.—*Construction and making-up of the following streets* in the parish of Kibworth Beauchamp:—Gladstone Street, Dover Street, Buller Street, Kimberley Street, White Street, and Rosebury Avenue, for the Market Harborough R.D.C. Plans may be seen at the offices of the council, and at the offices of the engineers, Everard, Son, & Pick, 6, Millstone Lane, Leicester, from whom quantities and form of tender may be obtained upon payment of £2 2s. Sealed tenders to be sent to the Clerk to the Council, Market Harborough, not later than 10 o'clock in the forenoon of Oct. 8, endorsed "Tender for Kibworth Roads." The contractor must provide sureties for the due performance of the contract.

Oct. 8. Petworth.—*Steam rolling and scarifying the roads* within the district which comprises the parishes of Barlavington, Bignor, Burton, Bury, Coates, Duncton, Egdean. Fittleworth, Kirdford, Northchapel, Petworth, Stopham, Sutton and Wisborough Green, for the R.D.C. The scarifying to be done at the rate of ¾d. per sq. yd. The Council will require one roller with scarifier and one without scarifier to be provided. It is estimated that the roller with scarifier may have to work in the aggregate for 60 days, and that without a scarifier forty days, but the council do not bind themselves to any exact number of days. Further particulars may be obtained on application to E. H. Staffurth, clerk to the Council, Petworth. Tenders for each roller, separately marked on the outside "Tender for Steam Rolling," to be sent to the Clerk on or before Oct. 8.

Oct. 8. Broadstairs.—1. *Supplying and delivering 1,400 feet run of 6-in. by 12-in. granite kerbing* (straight), 50 feet ditto (circular), and 650 feet run of 12-in. by 6-in. granite channel. 2. Supplying and delivering 250 tons of broken basalt or granite macadam, 1½-in. gauge. 3. 1,250 cubic yards of broken pit flints for the Broadstairs and St. Peter's U.D.C. Persons tendering must forward a sample truck of flints, carriage paid, to Broadstairs Railway Station, and such sample of flints will be paid for at the rate of the accepted tender. Those tendering for broken granite or basalt must forward a small sample of the material with their tender. Sealed tenders, endorsed with the names of the materials tendered for, must be delivered not later than noon on Oct. 8. No tender will be considered unless it be sent in on the prescribed form, which can be obtained from H. Hurd, C.E., town surveyor, Council Offices, Broadstairs.

Oct. 9. London, S.W.—*Supply and delivery of fine binding gravel* at parks, gardens, and open spaces under the control of the London C.C. Persons desiring to submit tenders may obtain the specification, schedule of quantities, form of tender, and other particulars at the Parks Department, 11, Regent Street, S.W. Tenders must be upon the official forms, and the printed instructions contained therein must be strictly complied with. Fair wages clause. Each tender is to be delivered at the County Hall, in a sealed cover addressed to the Clerk of the London County Council, Spring Gardens, S.W., and marked "Tender for Gravel, Parks and Open Spaces." No tenders will be received after 10 a.m. on Oct. 9th.

Oct. 9. London, S.W.—*Widening of the Lower Richmond Road* at the southern approach to Putney Bridge, in the Metropolitan Borough of Wandsworth. These comprise the demolition of the existing parapet wall and end walls of arches on the riverside of the footway and the removal of a portion of the present roadway, &c., surfaces; the construction of a new retaining wall and parapet; the extension of the brick arches beneath the roadway; and paving and other works. Persons desiring to submit tenders may obtain the drawings, specifications, bills of quantities form of tender, and other particulars upon application to M. Fitzmaurice, C.M.G., chief engineer, County Hall, Spring Gardens, S.W., upon payment to the Cashier of the Council of the sum of £3. Full particulars may be obtained on application at the County Hall previously to the payment of the fee for the specification, &c. Tenders must be upon the official forms, and the printed instructions contained therein must be strictly complied with. Fair wages clause. Each tender is to be delivered at the County Hall in a sealed cover, addressed to the Clerk of the London County Council, Spring Gardens, S.W., and marked "Tender for Alterations to Putney Bridge Southern Approach" No tender will be received after 10 o'clock a.m.. on Oct. 9.

Oct. 10. Guildford.—*Supply and delivery of the following road materials*:—4 0 tons, or thereabout, of Blue Guernsey Granite broken to pass a 2-inch gauge. 600 tons, or thereabout of blue Guernsey granite to pass a 1½-inch gauge. Forms of tender and conditions of contract may be obtained on application to C. G. Mason, M.I.C.E., the borough engineer and surveyor, at his office, Tunsgate, Guildford. No tender will be considered except upon the prescribed form. Tenders, endorsed "Tender for Broken Granite" are to be sent to F. S. Miller, town clerk, Town Clerk's Office, Bridge Street, Guildford, on or before Oct. 10, not later than 12 noon.

Oct. 11. Southend-on-Sea.—*Making-up of the following streets*:—Ambleside Drive (part of), Maldon Road, Station Avenue, Leonard Road, Cossington Road (part of), Elderton Road (part of), Cranley Road, Cranley Avenue (part of), Beach Road (part of). Plans, sections, and specifications may be seen and bills of quantities and forms of tender obtained on deposit of cheque for £1 1s. in respect of each street, upon application to E. J. Elford, M.I.M.E., borough surveyor. No tender will be considered unless made on the prescribed form, and there must be a separate tender for each street. Sealed tenders, endorsed with the name of the street and marked "Tender for Private Street Works," to be delivered at the office of W. H. Snow, town clerk, Town Clerk's Office, Southend-on-Sea, before 5 p.m. on Oct. 11.

Oct. 15. East Grinstead.—*Construction of a new dustless road* at East Grinstead, Sussex, for the owners of Marriott Estate, according to plans and specifications to be seen at 65, Lincoln's Inn Fields, London, W.C., any week day (except Saturdays) between the hours of 11 a.m. and 4 p.m. Copies of the specification and form of tender can be obtained on payment of a fee of £1 1s. Tenders should be addressed to Hasties, 65, Lincoln's Inn Fields, London, W.C., and should be delivered not later than 4 p.m. on Oct. 15,

Oct. 18. London, S.E.—*A cargo of about 350 tons Channel Island granite spalls* for stonebreaking, for the Grove Park Workhouse, Lee, S.E. Forms of tender can be obtained on application at the Clerk's Office, Woolwich Road, Greenwich, and must be delivered by noon on Oct. 18. on which date they will be opened at a meeting of the guardians.

No Date. Stonebridge.—*Providing and laying 400 yards. or thereabouts, of 2-inch artificial stone paving*, for the U.D.C. Particulars may be obtained on application to F. Woodward, surveyor, Town Hall, Stourbridge.

Nov. 8. Cape Town.—*Material and labour required for laying asphalt paving* in the carriage ways of Long Street and Darling Street (between Plein Street and Castle Bridge), and for the maintenance of the same in a perfect state of repair for a period of twelve months thereafter. The total area to be paved with asphalt is approximately 34,000 superficial yards, including the tramway tracks, and it is the intention of the Council to select several kinds of asphalt for testing purposes. The concrete foundations will be provided by the Council. Specification may be seen and forms of tender and full information obtained upon application at the Offices of Davis & Soper, Agents of the Corporation of the City of Cape Town, 54, St. Mary Axe, London, E.C. Tenders, under seal and endorsed "Tender for Asphalt Paving," must be delivered to Davis & Soper, not later than 4 o'clock p.m. on Nov. 8th, and samples not later than 4 o'clock p.m. on Nov. 1. No tender will be considered unless submitted on the official form

SANITARY.

Oct. 6. Skipton.—*Construction of detritus tanks, sedimentation tanks, continuous filters, the laying-out of about 20 acres of land, the construction of a storm-water bed and main*, and other works in connection with the Skipton U.D.C. sewage disposal works The drawings may be seen and a copy of the specification, schedule of quantities, conditions of contract, and form of tender obtained on application to J. Mallinson, Council's engineer, Town Hall, Skipton, on payment of £2 2s. Sealed tenders, in envelopes to be supplied, are to be delivered to R. Wilson, clerk to the Council. not later than Oct. 6.

Oct 6. Lichfield.—The Sanitary Committee of the City Council are prepared to receive separate tenders for the following works:—(*a*) Excavating and forming two filter beds, making and erecting wood carrier, on brick piers; alteration of humus tanks, including brickwork, cast-iron pipes and valves, building sludge chamber. with elevator and other appurtenant work in connection therewith, at the sewage works, Curborough, Lichfield. (*b*) Providing and fixing over the said filter-beds two complete sets of galvanized iron tubing to form fixed spray distributors. (*c*) Erection of workmen's houses, near to the above-mentioned works, at Curborough, Lichfield. Plans of the above-mentioned works may be seen, specifications, forms of tenders, and other particulars obtained on application to E. Brooke, city surveyor, Lichfield. Sealed tenders, separately endorsed, to be sent in to Herbert Russell, town clerk Lichfield on or before Oct. 6.

Oct. 8. Barnes.—*Supply of about 2,500ft. run of 30-in. concrete tubes*, and 600ft. run of 24-in. concrete tubes, delivered at Barnes or Mortlake, for the Barnes U.D.C. Specification and form of tender may be obtained of G. B Tomes, engineer and surveyor, Council House, High Street, Mortlake, S.W. Tenders, endorsed "Tender for Concrete Tubes," to be sent in not later than 12 o'clock noon on Oct. 8.

Oct. 10. Stockport.—*Manual and team labour and materials* required in the construction of about 1,360 lineal yards of egg-shaped sewers, varying in size from 3ft. by 2ft. to 4ft. by 2ft. 8in.; 100 lineal yards of cast-iron pipe sewers, 15in. and 21in. diameter; and 6,120 lineal yards of stoneware pipe sewers, varying from 12in. to 36in. diameter, together with all manholes and ventilators, the construction of a small detritus tank and screening chamber, and other incidental works for the sewerage of the added areas of Cheadle and Bramhall. Plans. sections, and details may be seen, and conditions, specifications of works and materials, bills of quantities, form of tender, &c., may be obtained at the offices of J. Atkinson, A.M.Inst.C.E. Borough Surveyor's Office, Stockport, on payment of a deposit of £3 3s. Tenders, addressed "The Borough Surveyor, Stockport," sealed and endorsed "Tenders for Sewers in Added Areas of Cheadle and Bramhall," to be left at his office at or before noon on Oct. 10. Fair wages clause.

Oct. 15. Eckington.—*Works of sewerage and sewage disposal* for the Parish of Eckington for the Chesterfield R.D.C. Drawings may be seen at the Office of E. Lines, Engineer, Union Offices, Chesterfield; and Specifications, Bills of Quantities, and Forms of Tender obtained (on and after the first proximo) from R. F. Hartwright, clerk to the Council, Union Offices, Chesterfield, on deposit of £3 3s. Sealed tenders endorsed "Tender—Eckington Sewerage," to be delivered at the above office not later than 12 noon on Oct. 15.

Oct. 22. Evesham.—*Provision, laying and jointing of stoneware pipe sewers*, together with manholes and lampholes, also the construction of liquefying tank, bacteria filters and other incidental works in accordance with drawings and specification prepared by the engineers for the R.D.C. Drawings and specification may be seen, and bills of quantities and form of tender obtained, at the offices of Willcox & Raikes, engineers, 63, Temple Row, Birmingham, on payment of a deposit of £3 3s. Sealed tenders, in envelopes supplied, endorsed "Badsey Sewerage—Contract No. 1," to be delivered to E. Wadams, clerk to the Council, Union Offices, Evesham, not later than 12 noon on Oct. 22.

Nov. 3. Bolton-upon-Dearne.—*Construction of 6,300yds, of 8-in. iron and 9-in. stoneware pipe sewers*, together with manholes, lampshafts, and all appurtenant works, and erection of No. 2 Septic tanks, bacteria beds, carriers, laying-out disposal site, &c., at Bolton-upon-Dearne, Yorkshire, for the U.D.C. The plans may be seen and quantities and form of tender obtained at the office of W. H. Radford, C.E., Albion Chambers, King Street, Nottingham, on deposit of £3 3s. A copy of the plans may also be seen at the Surveyor's Office, Station Road, Bolton-upon-Dearne. Tenders to be delivered or sent in to J. L. Hawksworth, clerk to the Council, Council Offices, Station Road, Bolton-upon-Dearne, Rotherham, on or before Nov. 3, endorsed "Sewers."

TIMBER.

Oct. 11. Cape Town.—*Supply and delivery of creosoted red deal blocks, also Australian or other hard-wood blocks*, including South African wood blocks. The blocks are to be 5 ins. deep, 3 ins. wide, 9 ins., 8 ins. and 7 ins. long for the Corporation of the City of Cape Town. The total area to be paved with wood is approximately 43,555 superficial yards, including the tramway tracks, it being the intention of the Council to select several kinds of wood for testing purposes. Specifications may be seen and forms of tender and full information obtained upon application at the offices of Davis & Soper, Agents of the Corporation of the City of Cape Town, 54, St. Mary Axe, London, E.C. Tenders, under seal, and endorsed "Tender for the Supply of Wood Blocks," must be delivered to the Agents not later than 4 o'clock p.m., on Oct. 11; and samples not later than 4 o'clock p.m. on Oct. 4. No tender will be considered unless submitted upon the official form.

MISCELLANEOUS.

Oct. 8. Croydon.—*Supply of stoneware drain-pipes* of various sizes for one year from Nov. 9 next. Tenders to be sent to F. C. Lloyd, town clerk, by 11 o'clock in the forenoon on Oct. 8, endorsed "Tender for Drain Pipes."

Oct. 8. Cowes.—*Supply of best quality Portland cement* for the U.D.C., to be delivered at the town quay, Cowes, I.W., in such quantities as may be required during the period ending Sept. 29, 1907. Further particulars may be obtained from J. N. Webster, engineer and surveyor to the Council. Sealed tenders, endorsed "Tender for Portland Cement," to be delivered to H. C. Damant, clerk, High Street, Cowes, I.W., on or before Oct. 8, not later than 4 p.m.

Oct. 8. London, N.W.—*Supply of general stores* during twelve months ending Oct. 31st, 1907, for the Metropolitan Railway Co. Manufacturers and others desirous of tendering should apply to R. H. Selbie, secretary, Secretary's Office, 32, Westbourne Terrace, London, W., for a form or forms under the following numbers: No. 4, bolts, rivets, spikes, washers, iron fencing. &c.; No. 10, castings—iron (including malleable); No. 11, cement, bricks, slates, stoneware pipes, paving, broken granite, &c.; No. 12, cocks, valves, gas gauges, gas burners, incandescent mantles, &c.; No. 14, colours, varnishes, putty, gold leaf, &c.; No. 15, copper, brass, solder, spelter, antimony &c.; No. 29, iron and mild steel bars, plates, &c.: No. 30, ironmongery—locks, hinges, screws, &c.; No. 33, lead—pig, pipe, sheet, white, red; No. 40, pipes—iron socket and rain water, &c.; No. 41, sand, gravel, and picked flints; No. 42, signal ironwork, wire pulleys, switchboxes, &c.; No. 44, telegraph fittings, battery jars, zincs, insulators, &c.; No. 45, timber—deals, creosoted, telegraph poles, wire casings, &c.; No. 46, timber—teak, mahogany, oak, ash, jarrah, &c. After the forms have been obtained, samples and patterns of articles and goods may be seen at the office of the company's storekeeper, adjoining Neasden Station, N.W. Tenders on the form supplied by the company only. and endorsed "Tender for ——," must reach the Secretary not later than 10 a.m. on Oct. 8th.

Oct. 9. Southern Mahratta.—*Supply of (1) Miscellaneous tools and stores (2) 1,000 brass boiler tubes* for the Board of Directors of the Southern Mahratta Railway Co., Ltd., as per specifications and drawings, which may be seen at the offices of the Company, 46, Queen Anne's Gate, London, S.W. The charge for Specification No. 1 is 10s. 6d., and for No. 2 £1 1s. each, which will not be returned. Tenders must be sent in addressed to the secretary, marked "Tender for Tools and Stores," or as the case may be, not later than noon on Oct. 9.

Oct. 9. Rosslynlee. — *Supplying oils and paints, plumbers' materials*, electrical fittings, materials and fittings for machinery and boilers for the Midlothian and Peebles District Asylum, Rosslynlee. for six months from Oct. 15 to April 14, 1907. Forms of tender can be had by applying to R. Addison Smith, clerk and treasurer, 19, Heriot Road, Edinburgh, with whom offers must be lodged on or before Oct. 9. Samples of all articles may be seen at Rosslynlee Asylum, and offers will be made on the basis of those samples, unless otherwise directed.

TOO LATE FOR CLASSIFICATION.

Oct. 6. Wetherby. — *Providing and fixing certain fencing* at Weeton and Huby, for the R.D.C. Copy of specification may be obtained from R. Wiseman, surveyor, Wetherby, or E. H. Coates, clerk to the Council, Wetherby. Tenders to be sent into E. H. Coates not later than Oct. 6, marked "Fencing."

Oct. 8. Amsterdam (Holland).—*Construction of a tunnel, platforms, &c*,, at the Haarlem Station. 318,000 florins. Particulars, specifications, &c., may be obtained on application to Director of Dutch Railways, Amsterdam. Tenders must be delivered by Oct. 8.

Oct. 13. Theux (Belgium).—*Construction of a bridge* over the Hoegne, at Chaufherd, 12,400 francs. Specifications and particulars may be obtained on application to Secretariat Communale, Theux, Liege. Tenders must be delivered by Oct. 13.

Oct. 13. Nantymoel.—*Erection of a new police station* at Nantymoel, for the Standing Joint Committee of the Glamorgan Quarter Sessions and C.C. Fair wages clause. Plans and specification of the works may be seen and copies of the bill of quantities obtained at the Police Station, Tynewydd, and of T. M. Franklen, clerk of the County Council, Glamorgan County Council Offices, Westgate Street, Cardiff. Sealed tenders are to be delivered to the clerk, together with the full names and addresses of two substantial sureties, not later than Oct. 13, marked outside, "Tender for Nantymoel Police Station."

October 16. Hamar (Norway).—*Supply of iron materials* for the Norwegian State Railways. Tenders, in sealed envelopes, marked "Anbud paa Leverance af Jernmaterialier," must be delivered to Maskiningeniorens Kontor, Statsbanen, Hamar, by Oct. 16

Oct 19. Lerwick.—*Erection of a fish mart and offices* proposed to be erected on Alexandra Wharf, Lerwick. Plans and specifications may be seen with A. Sandison, clerk, at Lerwick, and with J. Barron, M.Inst.C.E., 216 Union Street, Aberdeen. Tenders to be lodged with the clerk on or before Oct. 19.

Oct. 31. Constantinople (Turkey).—*Supply of 10,000 tons of iron sleepers*, 5,000 tons of rails of Siemens Marten steel from March to May, 1907. Particulars and specifications may be obtained on application to Haute Commission du chemin de fer Hamidie-Hedjaz, Constantinople. Tenders must be delivered by Oct. 31.

No date. Ossett.—*Erection of new Wesleyan Church*, Ossett. Contractors desirous of tendering are requested to forward their names to Garside & Pennington, architects, Pontefract and Castleford, when bills of quantities and other particulars will be supplied.

Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, *Great New Street, Fetter Lane, E.C.*

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Colwyn Bay.—Accepted for the erection of a new county police station, for the Denbighshire C.C. :—

Mayers & Son, Chester £7,498

Gainsborough.—For pulling down and rebuilding premises in Bridge Street, for the Gainsborough Industrial Co-operative Society. Messrs. Scorer & Gamble, architects, Bank Street, Chambers, Lincoln :—

Times Land Building and Contracting Co., Grimsby	£3,605	6	6
B. Selby, Blyton	3,420	0	0
A. & H. Woods	3,414	17	0
C. Williamson, Nottingham	3,256	0	0
F. M. Thompson & Son, Louth	3,212	0	0
Guttridge, Peterborough	3,179	0	0
H. S. W. Close, Lincoln	3,145	0	0
G. Baron, Nottingham	3,133	0	0
H. Peake, Peterborough	3,100	0	0
Sprakes & Sons, Doncaster	3,050	0	0
Dorrington	2,999	10	0
B. Pumfrey	2,921	19	0
Moss & Sons, Loughborough	2,848	2	0
Elmes,* North Street	2,700	0	0

* Accepted. (Rest Gainsborough.)

Hereford.—For alterations and additions to Marbury House, St. Owen Street, for Mr. A. Thomason. Messrs. Groome & Bettington, architects and surveyors, King Street, Hereford :—

W. Preece	£299	10	0
C. Cooke	268	0	0
R. L. Friend	265	0	0
W. Rowbery	259	0	0
E. W. Wilks	247	10	0
Thos. Hiles	246	10	0
J. T. Jones	210	0	0
W. C. Bolt*	160	0	0

* Accepted.

Hounslow.—For certain alterations and improvements at the Isleworth Public Hall, for the Heston and Isleworth U.D.C. :—

C. Emmett	£1,269	4	11
H. Burfoot & Son, Windsor	1,100	0	0
Chambers Bros., Ealing	1,092	0	0
Cutler & Sons	997	0	0
Eldridge & Son, Twickenham	982	0	0
G. Danels & Son	980	0	0
C. Gray, Shepherd's Bush	950	0	0
W. Lacy*	898	0	0
F. Deacon & Son, Addlestone (withdrawn)	773	0	0

* Accepted. (Rest of Hounslow.)

Hull.—For the erection of proposed school buildings in Selby Street West, for the Education Committee. Mr. Joseph H. Hirst, city architect :—

Bowman & Son	£15,450	0	0
H. T. Arnott	15,408	18	11
J. Houlton & Son	14,620	0	0
Trubell, Son, & Greenwood	14,548	13	6
G. Houlton & Son	14,500	0	0
J. Simpson & Sons	14,498	0	0
Hull General Builders	14,392	0	0
M. Harper	13,993	7	0
T. Goates	13,972	8	0
G. H. Panton,* Anlaby Road	13,580	0	0

* Accepted. (All of Hull.)

Llandilo.—For the construction of a cattle market and auction mart adjoining the Llandilo Bridge Station, for the Llandilo and District Cattle Market and Auction Market Co. Mr. Arthur S. Williams, architect, Llandilo :—

G. Mercer, Llanelly	£2,480	0	0
Jenkins, Swansea	2,253	4	0
F. C. Williams, Cardiff	1,996	5	6
M. Morgan & Son, Gwynfi	1,970	0	0
W. D. Morgan,* Garnant	1,870	0	0
Davies & Griffiths, Pembroke Dock	1,851	0	0

Note.—Ironwork not included in above amounts.

* Accepted.

Mountain Ash.—For the erection of a mixed school, to accommodate 400 children, with the necessary offices, boundary walls, &c., at Darranlas, for the Mountain Ash U.D.C. Education Committee. Mr. W. H. Williams, architect, Town Hall, Mountain Ash :—

E. Thomas & Sons, Seven Sisters	£6,679	0	0
Jones Bros., Barry	5,930	8	0
G. Harris, Abercynon	5,877	18	0
J. Davies & Co., Mountain Ash	5,820	0	0
Hughes & Stirling, Liverpool and London	5,675	0	0
C. Jenkins & Sons, Porth	5,545	0	0
J. H. James, Cardiff	5,520	0	0
A. R. John, Mountain Ash	5,443	0	0
Knox & Wells, Cardiff	5,423	0	0
Williams Bros., Ynysybwl	5,404	11	6
C. Leather & Sons, London	5,374	0	0
A. Richards, Barry and Pentre	5,545	10	8
Jones Bros., Quaker's Yard	4,992	17	6
T. W. Davies,* Mountain Ash	4,990	5	0
A. J. Colborne, Swindon	4,927	14	10

* Accepted.

Tipton.—For the erection of proposed new branch library at Toll End, for the Tipton U.D.C. Mr. Geo. H. Wenyon, M.S.A., architect and surveyor, Tipton. Quantities by architect. The alternative tender is for artificial stone in lieu of Hollington

				Alternative tender.		
W. A. Kendrick	£1,847	0	0	£1,639	0	0
C. A. Horton	1,800	0	0	1,730	0	0
M. Round	1,645	0	0	1,555	0	0
J. Dallow & Sons	1,630	0	0	1,560	0	0
Hy. Smith & Sons	1,599	0	0	1,584	0	0
W. T. Lees	1,596	3	0	1,535	3	0
G. Jones	1,545	14	11	1,515	14	11
W. Willets	1,517	0	0	1,487	0	0
R. Speake & Sons*	1,498	0	0	1,448	0	0

* Accepted revised at £1,398.

Coming Events.

Friday, Oct. 5.

ARCHITECTURAL ASSOCIATION.—Annual General Meeting. President's Address (R. S. Balfour) and Distribution of Prizes.

ROYAL SANITARY INSTITUTE.—Provincial Sessional Meeting at Belfast Town Hall, at 7.30 p.m. Discussion on "The Sewage Purification Problem, with Special Reference to Sewage Discharge into a Tidal Estuary."

Saturday, Oct. 13.

INSTITUTE OF SANITARY ENGINEERS.—Visit to Messrs. Waring & Gillow's new premises, Oxford Street.

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—Adjudication.]

DURING THE WEEK ending Sept. 28th eighteen failures in the building and timber trades in England and Wales were gazetted.

W. WADE, builder, Crewe. R.O., Sept. 17.

O. C. PARFITT, plumber, Bristol. R.O., Sept. 19.

E. CHESTERMAN, carpenter, Bristol. R.O., Sept. 22.

C. COMBER, builder, Southend-on-Sea. R.O., Sept. 20.

W. J. L. THOMAS, carpenter, St. Tudy. R.O., Sept. 22.

A. IBBOTT, builder and contractor, Bedford. R.O., Sept. 12.

W. MARTINEAU, engineer, Wolverhampton. R.O., Sept. 19.

G. WILKES, builder, Quatford, near Bridgnorth. R.O., Sept. 21.

WHOLESALE PLUMBERS' SUPPLY CO., plumbers' merchants, Rochdale. R.O., Sept. 21.

A. COATES, painter and decorator, Shildon. P.E., Durham C.C., Oct. 9, at 10.40.

T. R. AXCELL, builder, Southend-on-Sea. P.E., Shirehall, Chelmsford, Oct. 3, at 10.

G. W. BASTER, builder and contractor, Southsea. P.E., Portsmouth C.C., Oct. 29, at 11. R.O., Sept. 17.

H. RILEY, journeyman painter, Harrogate. P.E., Courts of Justice, York, Oct. 5, at 11. R.O., Sept. 17.

F. MUNNS, builder, Leagrave. First meeting O.R.'s, Northampton, Oct. 3, at 12. P.E., Luton C.C., Oct. 25, at 11.30.

R. J. WRIGHT & CO., builders, Hitchin. First meeting O.R.'s, Northampton, Oct. 3, at 12.30. P.E., Luton C.C., Oct. 25, at 11.30.

R. POWNALL (J. W. Dawson and J. E. Harrison), builder and timber merchant, Heywood. Liabilities about £7,000.

W. WATSON, builder, Bishopbriggs, Glasgow. Liabilities, £11,959; assets £5,846; deficiency, £6,112.

New Companies.

MATTHEWS, KERSHAW & CO., stone, marble, and granite masons, &c., Albany Wharf, Redhill Street, Regent's Park Basin, London. Capital: £4,000.

PREMIER (GLOUCESTER) PRESSED BRICK CO., LTD., to acquire the patent rights for the United Kingdom of the "Excelsior Silo" system (Eaton's patent) of manufacturing bricks, and to carry on the business of munufacturers of sand lime bricks, etc. Green Street, Brockworth, Glos. Capital: £30,000.

NATIONAL PORTLAND CEMENT CO., LTD.—To acquire certain freehold land near Foxton Station, Cambs., for the erection of works for the manufacture of Portland cement; to adopt an agreement between S. B. Birds of the first part, E. W. S. Asquith and T. A. Buttery of the second part, and A. Mitchell (for this company) of the third part, and to carry on the business of manufacturers of Portland cement, lime, bricks, stones, tiles, and pipes, &c. Dickinson's Court, Boar Lane, Leeds. Capital: £36,000.

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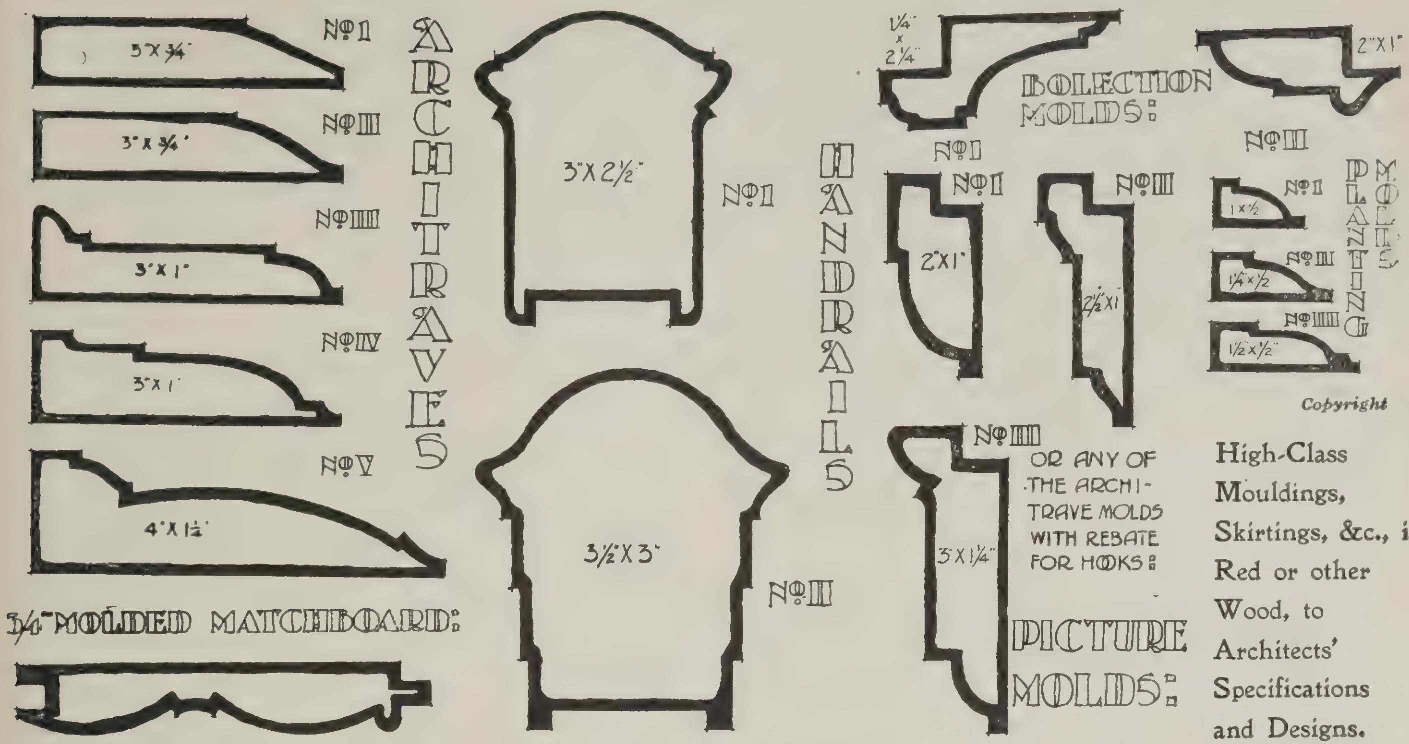

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Current Market Prices.

FORAGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	14	0	1	16	0
Clover, best...	per load	4	4	0	4	15	0
Hay, good	do.	3	17	6	4	2	6
Sainfoin mixture	do.	4	0	0	4	7	6
Straw...	do.	1	8	0	1	14	0

MISCELLANEOUS.

		£	s.	d.	£	s.	d.
Bricks Stocks, d/d to job	per 1,000	1	15	0	—		
Do. Flettons on rail ...	do.	1	5	0	—		
Do. Pressed Wire Cuts, d/d to job ...	do.	1	17	0	—		
Do. Blue brindled wire cuts	do.	1	2	0	—		
Do. do. wire cuts ...	do.	1	6	0	—		
Do. do. pressed facings	do.	1	17	6	—		

METALS.

		£	s.	d.	£	s.	d.
Standard Copper	per ton	91	0	0	91	10	0
Do. Strong sheets ...	do.	91	0	0	92	0	0
Lead, soft foreign... ...	do.	18	10	0	18	15	0
Do. English	do.	18	15	0	19	0	0
Do. pipes...	do.	21	7	6	21	10	0
Do. sheets	do.	20	15	0	21	5	0
Galvanised Corrugated sheets	do.	12	12	6	12	15	0
Spelter G.M.	do.	27	10	0	27	15	0
Angles, Scotland	do.	6	15	0	6	17	6
Bars, do.	do.	7	15	0	8	0	0
Marked bars, Staffs. ...	do.	8	10	0	8	12	6
Common bars, do. ...	do.	6	7	6	6	10	0
Angles, M'boro.	do.	6	7	6	6	10	0
Joists. M'boro	do.	6	5	0	6	7	6
Angles, Midlands	do.	6	12	6	6	15	0
Joists do.	do.	6	15	0	6	17	6
Girder plates, Midlands ...	do.	7	5	0	7	7	6
Angles, Foreign, c.i.f. Thames	do.	6	7	6	6	10	0
Tees do. do. do.	do.	6	10	0	6	12	6
Joists, do. do. do.	do.	6	3	6	6	5	0
Channels do. do. do.	do.	6	7	6	6	10	0
Plates do. do. do.	do.	6	15	0	7	0	0
Tin, Foreign	per ton	190	0	0	191	0	0
Do. English ingots ...	do.	190	10	0	191	10	0
Zinc, sheets, Silesian, f.o.b.	do.	32	0	0	32	10	0
Do. do. V.M. do.	do.	32	10	0	33	0	0

TIMBER.

		£	s.	d.	£	s.	d.
Deals, Archangel, White 1st, 3×11	per std.	15	10	0	—		
Do. do. do. 2nd, 3×11	do.	11	10	0	—		
Do. do. do. do. 3×9	do.	10	10	0	—		
Do. Constantza, White, 3rd, 3×11	do.	9	5	0	—		
Do. do. do. do. 3×9	do.	8	10	0	—		
Do. Nederkalix, Yellow, 2nd, 3×9	do.	9	10	0	—		
Do. Norrkoping, White, unsorted, 3×11	do.	9	0	0	—		
Do. Montreal, Yellow Pine, 1st, 3×11	do.	22	0	0	22	10	0
Do. do. do. do. 3×11	do.	22	10	0	—		
Do. do. Pine (dry), 3rd, 3×11	do.	8	10	0	—		
Do. Skelleftea, Yellow 1st, 3×9	do.	11	5	0	—		
Do. do. do. do 2½×7	do.	10	10	0	—		
Do. St. Petersburg, White, 3rd, 2½×7	do.	8	15	0	—		
Battens, Fredrikstad, White (planed) 1×10	do.	7	15	0	—		
Do. do. do. unsorted, 1¼×10	do.	9	5	0	—		
Do. do. do. do. 1×10	do.	8	10	0	—		
Do. do. Mixed Yellow (planed) 1×9	do.	9	0	0	—		
Do. Helsingfors, Yellow, unsorted, 2½×6½	do.	8	10	0	—		
Do. do. do. do. 2½×6	do.	8	10	0	—		
Do. Mesane, Yellow, 3rd, 1½×7	do.	10	15	0	—		
Do. Raumo, Yellow, unsorted, 2×4	do.	9	15	0	10	0	0
Do. do. do. do. 2×3	do.	9	10	0	—		
Do. St. Petersburg, White, 3rd, 2×6	do.	8	5	0	8	10	0
Do. do. do. do. 2×5	do.	8	10	0	—		
Do. do. do. do. 1×6	do.	8	10	0	—		
Do. do. do. unsorted, 1×7	do.	9	0	0	—		
Battens. Sornas, Yellow, unsorted, 2×4	per std.	9	15	0	—		
Do. do. do. do. 2×4	do.	9	10	0	—		
Do. do. do. do. 1×6	do.	9	0	0	—		
Do. do. do. do. 1×5½	do.	8	15	0	—		
Do. Mon. (Sundswall) White (planed), 1×9	do.	7	10	0	—		
Flooring Boards, Frederiksstad Yellow and White, 1×6½	do.	0	7	9	—		
Do. do. do. do. 1×6	do.	0	7	6	—		
Do. do. do. do. 1×6	do.	0	7	9	—		
Do. do. Mixed Yellow, 1×5½	do.	0	9	0	—		
Do. do. do. do. 1×4½	do.	0	8	3	—		
Do. Mon (Sundswall), Yellow, 2nd, 1¼×6	do.	0	14	0	—		
Do. do. do. 2nd, 1¼×6	do.	0	13	9	—		
Do. do. do. 2nd, 1×6	do.	0	11	0	—		
Do. do. do. 1×6	do.	0	7	6	—		
Do. Johannedal, White 2nd, 1×6	do.	0	11	0	—		

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Birch, New Brunswick ...	do.	2	15	0	4	15	0
Do. Quebec	do.	2	5	0	5	0	0

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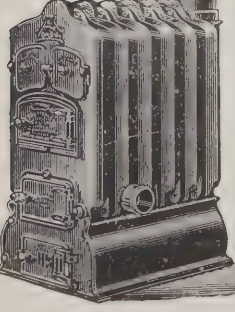

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The Architect *v.* the Jobbing Builder. WE are accustomed to accept what is the customary system as inevitable, without troubling to think about it, but if we chose to compare our everyday practice in many directions with the practice of other countries we should often find that we might very materially modify our methods with advantage. Other countries are as old as ours—in fact, some are older; so that when we find a different system in vogue on the Continent we should always be prepared to enquire into it more closely than some novelties hailing from the other side of the Atlantic. Newer countries are able to develop methods of dealing with new problems, but the older countries offer suggestions in regard to the smaller things we count as commonplaces. This applies particularly to the lesser matters of the building trades, such as our system of dealing with small repairs and alterations, redecoration of houses, &c. An English householder is ever ready to call in the aid of the small master-man who goes under the generic name of the jobbing builder. In France, however—at any rate, in the greater part of that country—the class of jobbing builder is non-existent. Quite a different system prevails in dealing with things which come under his wing here, and apparently many of the anomalies which exist are removed under the French system. There a householder calls in the assistance of an architect, instead of running to some small tradesman, who has usually risen from being a journeyman. The architect is expected to engage the tradesmen, to instruct them to meet the wishes of his client, and to supervise their work; and, finally, he has to see that the work is well done and that his client is not overcharged. As a class, the jobbing builder is not a particularly intelligent person. The very fact of his having risen from the ranks means that he has not passed any examinations and has had no education in any trade but his own. His ideas of taste, and his methods of dealing with constructional matters, are wonderful and strange. If it were not for the craftsman he employs he would often never pull through a difficult job at all, and his experiments and inexperience are both alike paid for by the public. We all know how the comic papers make a butt of these small tradesmen for their overcharges, and, although a good deal is exaggerated, there is much truth in this general opinion. The encouragement which the public gives to the furtherance of such a system is primarily due to the system being accepted as inevitable, even as a necessary evil which has to be put up with, but we are rather inclined to think that the jobbing builder receives a good deal of work from persons who like to have their own way and superintend the decoration of their homes themselves—persons who feel that if they went to an architect they could not get him to carry out their fads and fancies; indeed, he might take the matter too much out of their hands, and perhaps lead them into an expenditure beyond what they desire. The jobbing builder, of course, panders to the public. It does not matter to him what experiments are made by his clients. His men are paid for by time, and, if a job takes longer than it should, that is all to his advantage. From every point of view, the public would find it far better and cheaper to go more to the architect; and, although architects here (not being accustomed to undertake such duties as their brethren do in France) are without any recognised basis of charges, it would be an easy matter for this to be settled. Instead of decorations and repairs being carried out by inexperienced and ignorant men, many of whom can scarcely read or write, the work would be executed in the best and speediest manner when placed in the hands of a person professionally trained and educated to deal with such matters. Of course, we cannot expect the medieval system of Japan to have much weight in appeal to the public; but it is a point of interest to know that in that country the public go to an architect, who engages the workmen to build a home, and ever afterwards, in his lifetime, the occupants call in his assistance when they desire any alterations, repairs or decorations. Undoubtedly, there are many men engaged in jobbing works who are educated, who have taste and ability, and who serve the best interests of the public. Alteration in the existing system would not affect them. But, in any case, the change will be gradual, if it comes at all. Even if it did come, the architect would need firms, as well as craftsmen, to co-operate with him. We only emphasise the crudities of the present system in England, and point a way of modification which might result in removing many anomalies.

Colouring Brickwork. IT is a common practice when brickwork gets dirty, after a few years' exposure to the sooty atmosphere of towns, to brighten it up by applying colour washes and repointing. This is pernicious, for not only does it never produce the desired effect of new brickwork, but it looks what it is —"painty"—and after a year or so its appearance is worse than ever. Sometimes yellow stocks, or white Suffolks and Burham bricks are actually transformed into red bricks. The pointing, too, is ludicrous; the joints are filled up flush, the colour-wash applied over all, and the pointing lined in according to the fancy of the workman, often somewhat out of the horizontal and with imperfect perpends, and finally with the most weird conception of bonding. The suburban villa is bad enough without this sham brickwork. If it must be cleaned up, why not spend a little more time and trouble in rubbing down the surface and showing the honest substance of the real bricks?

THE ARCHITECTURAL ASSOCIATION.

Mr. Balfour's Presidential Address.

The opening meeting of the session of the Architectural Association was held at Tufton Street, Westminster, on Friday evening last, when Mr. R. S. Balfour, F.R.I.B.A., the new president, delivered his inaugural address. For the most part it dealt with the internal affairs of the Association. After the orthodox prologue of thanks for the past, apologies for the present, and hopes for the future, Mr. Balfour went on to speak of the officers of the Association—the wonderfully successful presidency of Mr. Guy Dawber, the handing over of the treasurer's keys from Mr. Francis Hooper to Mr. Henry T. Hare, changes on the council, the assiduity of their secretary, Mr. Driver, and the services rendered to the Association by Mr. W. G. B. Lewis; instructors, too, were not forgotten, for the president had an eloquent tribute for Mr. Pomeroy (who had been obliged to relinquish his position as Instructor in Modelling on account of the increased calls on his time since his election to the Royal Academy), and there was also a warm congratulation for Mr. de Gruchy on his recent appointment to the newly-constituted architectural schools at the Academy.

Leaving the *personæ grata,* Mr. Balfour turned to the Association itself and its progress. When their jubilee was celebrated in 1897 they had a membership of 1,111 and subscription receipts amounting to £841; to-day they had more than 1,700 members, while the subscriptions last year were £1,406, which was most satisfactory. They still had their building debt, however, despite the astounding reception meted out at their last annual dinner to that portentous, though quite unofficial toast,

"Death to the Building Debt."

The means by which they had hitherto sought to bring about his complete annihilation had almost come to an end, and latterly they had only been able to administer such homœpathic doses as those little silver pilules of the "Purple Patch" Shilling Fund—drugs quite inadequate for the purpose in hand. Mr. Balfour agreed that there might be few occasions when murder was legitimate, even praiseworthy, "but, gentlemen, I want you to be my accomplices in ridding ourselves from the fetters of this tyrant. . . . I wonder how many of you are aware that if each member of the A.A. who has not already done so contributed only 15s., this £767 debt of ours would to-morrow morning be an incident in our bygone history. It seems to me incredible that in a society like this . . . we should have to deplore the apathy of those 1,032 members who have hitherto forgotten or overlooked the appeals of our late president and council, and whose lethargic consciences have permitted them to disregard their imperative obligations."

The A.A. Day School

next claimed the president's attention. Its progress had indeed been phenomenal. In 1903-4 the number of students was 32, the next year 42, while the present session had been started with 65. The Evening School, too, had been a complete success. The curriculum of the School of Architecture had been very extensively revised, after most careful investigation and thought, and though they did not claim their new syllabus to be perfect, they felt the Association now had the machinery of a complete organisation for a progressive, thorough, yet succinct course of study, which was bound to commend itself to students, as well as to those who had the best interests of our future architects at heart. "We have all along set our faces against the idea which some few misguided individuals hold, that our educational work is a cramming apparatus for administration to unwilling or mentally deficient young men (whose parents think they will make good architects because they are incapable of doing anything else) of those few but needful formulæ of which some knowledge is required at the R.I.B.A. and other examinations. I think we may congratulate ourselves that our revised arrangements will not encourage that idea."

In drafting their new education scheme, however, the council had by no means come to the end of their tether; there were still many directions in which they would like to enlarge the scope of their enterprise—a life class, for instance, which was mooted.

Having thus touched upon the educational work of the Association, Mr. Balfour turned to its social side. During the last few months, he said, there had been considerable activity among the junior ranks, resulting in the establishment of various societies under the ægis of the Association. The council welcomed these—the recently founded Athletic Club and the Musical Society, for example—because they tended so effectually to increase and cement the comradeship which had always been, to some extent, a feature in the career of the Association. The Rifle Club, to be inaugurated by Lord Cheylesmore on October 27th, was another of their offshoots. Architects did not as a rule display a very brave record in the athletic world, but there were exceptions, and Mr. Balfour took occasion to mention their vice-president, Mr. Walter Cave, as an example that there was no reason why a very distinguished athlete should not, in the fulness of time, become a no less distinguished architect.

Finally, in dealing with the affairs of the Association, the president said a few words about

"a somewhat delicate matter,"

no other than the requests which the council received from time to time from ladies desirous of becoming members or attending classes. "These applications we are obliged to decline, because you, gentlemen, voted resolutely in opposition to the proposal for their admission as members. Your decision at that time was of such a determined character that we have hesitated to raise the question again. I, for one, have never been convinced of the cogency of the arguments brought forward, and it has always seemed to me on that one occasion in its career the Association fell away from its vocation, betrayed its traditions, and adopted a policy distinctly reactionary in character. Since 1893, however, times have changed; the female sex has, with its charming insistence, ingratiated itself into many spheres which have hitherto been regarded within the sole prerogative of man. Even the R.I.B.A. has admitted ladies within its jealously-guarded portals of membership, they have invaded the offices of many architects, and from what I can gather all the prophecies of disaster have remained unfulfilled. On the contrary, my inquiries convince me that the converse is the case, that more steady work is the result, and that the beneficial restraint that a woman' presence commands has elevated the tone of those offices. . . . Surely the electorate of to-day in this society cannot be misogynists, with such hard and unrelenting natures as the electorate of 13 years ago!"

With this (bachelor) advocacy of lady architects, Mr. Balfour took his leave of the Association's affairs, and for the remainder of his address gave a running commentary on some general topics. First came a brief reference to the International Congress, and a briefer reference to the Palace of Peace Competition, and, speaking of competitions, Mr. Balfour was naturally led on to make a few remarks about

the competition for the London County Hall,

which the L.C.C., with cosmopolitan benevolence, had opened to the whole world. All, or nearly all, British architects were ready to recognise the merit in the noble modern buildings we saw on the Continent and in the United States, but in this instance we had some justificaton in expressing dissent. The county hall had not, and never could have, any international significance. It was to be a structure for London alone, and London only. "All English architects will commend heartily any steps which the County Council can reasonably take to secure a design of the greatest possible merit, but I feel convinced that in London we want (and we intend to have) an edifice which interprets for us the great heritage of our national architecture. We desire in these days to see no alien structure, no matter of what magnificence, set down to face the quiet serenity of our Palace of Westminster, in the very heart of this great Empire. A British brain must conceive this great new building and British hands must alone bring it into being. I trust I am no 'Little Englander,' but I would ask the London County Council, the educated citizen of London, or that particularly common-sense and level-headed member of the proletariat, the 'man in the street,' whether any of them have for one moment contemplated the possibility of our having raised up for our edification across the river a structure resembling, for instance, the grotesque design for the Hague Palace of Peace, as a monument to the taste of our municipal government, as an everlasting protest by them against the incompetence of our own architects, and as an object-lesson to us of what they deem the highest form of our art.

"I very much fear that the County Council in their collective capacity have not as yet recognised a due appreciation of the broad national characteristics and constituents of our calling which go to form the history of its particular evolution in this land, and still less those subtle phases and delicate variations which invest its study with such infinite charm to the architect himself and to the educated portion of the community. Is this natural solicitude of ours for our own particular national type of architecture an effete product unworthy of consideration at the hands of the Councillors? If that is their view, then perhaps we need not feel so much wonder either at their disregard for the arboreal adornment of our Victoria Embankment, that ruthless destruction of the beautiful emerald ribbon which borders London's noblest highway, that sacrifice of its calm environment, in the cause of those dreadful bugbears, 'utility' and 'class legislation,' the scarring of its surface with tramway lines, and the conversion of its comparative peace for ever into a babel of noisome sounds. . . . It would be a matter for congratulation if the County Council could see their way to institute a Committee of Taste, whose duty it would be to overlook all new schemes before they are put into actual execution, with a view to the avoidance of such unfortunate solecisms as those which have, alas, been perpetrated in the past, and to safeguard us in the future against thoughtless and unnecessary offences against the canons of art and the beauty of our great metropolis. . . ."

A vote of thanks to the president for his address was proposed by Mr. Guy Dawber, seconded by Mr. E. T. Hall, and supported by Mr. A. Needham Wilson and Mr. G. H. Fellowes Prynne. Mr. Dawber referred to the Building Fund debt, and said it was really a great shame that there were more than a thousand members of the Association who had not contributed a penny towards the extinction of the debt. Mr. Hall referred to the incomplete way in which students were educated at the public schools. He pointed out that Mr. Maule, the master of the Architectural Association School, had to reject 25 per cent. of the applicants on this account. As to lady students, he strongly advocated that these should be allowed to become members of the Association.

During the evening prizes and medals were distributed to the students who had been successful during the past session. The reinstatement of Messrs. E. W. Poley and E. W. Sloper was announced, and a vote of thanks was passed to Dr. Pritchard for a donation of several hundred lantern slides and negatives, including an excellent set of Indian architecture as well as Italian, Dalmatian, German and English.

The president announced that the next meeting of the Association would be held on October 19th, when a paper would be read by Mr. Alan Potter on "The Architecture of the Roman Empire."

SOCIETY OF ARCHITECTS.

Annual Report.

The 22nd annual report of the Council of the Society of Architects, to be presented to the annual meeting on October 18th, states that during the past session 57 new members were enrolled, 3 honorary members, and 54 students registered, while there were 32 losses by death, removal or resignation. The total membership is now 778, a net increase of 75 over last year.

Reference is made to the

Revised Articles of Association

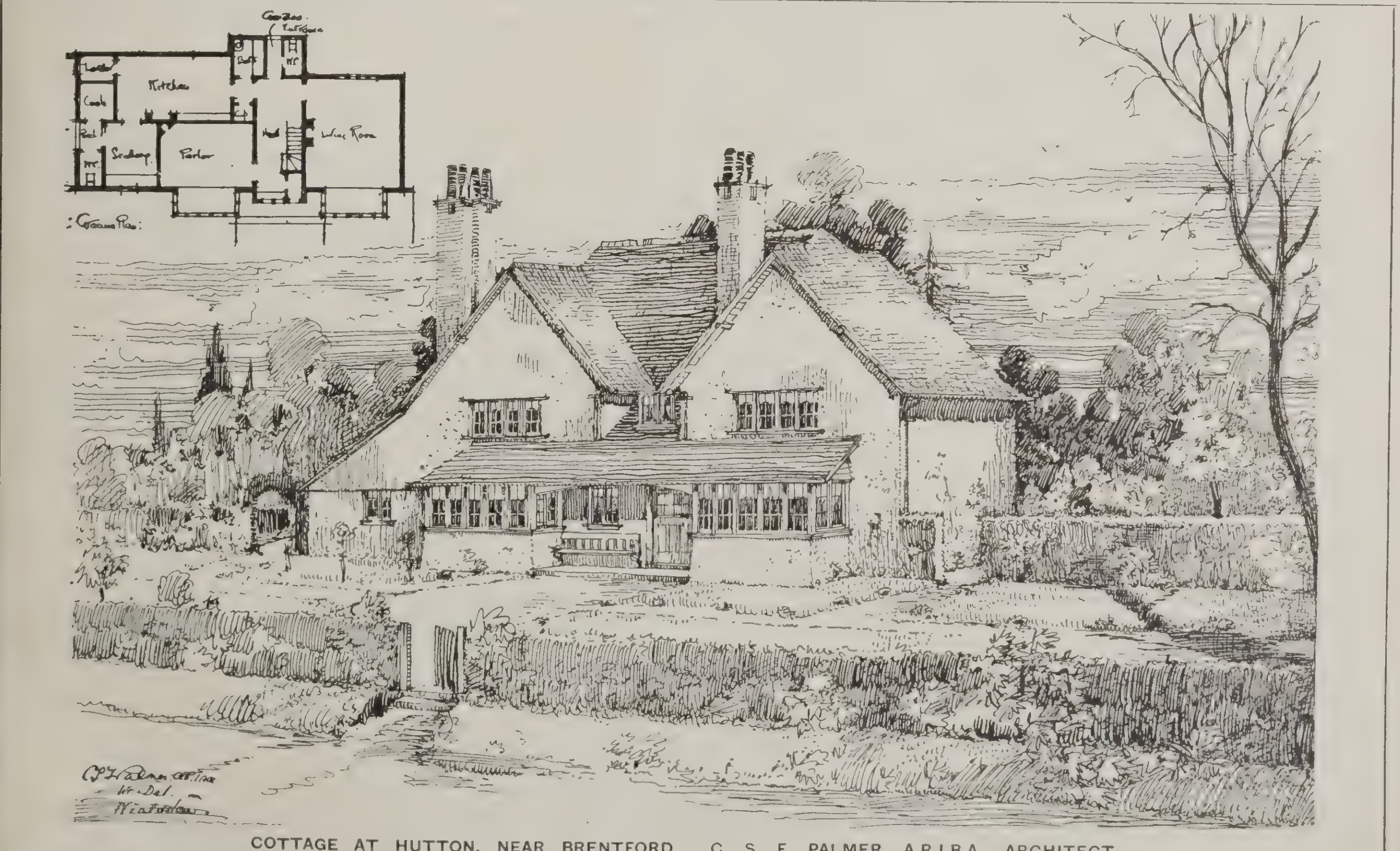
which come into force on November 1st. It has been decided to do away with the class of Associates, and a new class has been provided for students (with their own committee), who have hitherto had no recognised status in the Society. The council has been increased from 12 to 18 members, the office of "honorary corresponding secretary" has been abolished as no longer necessary, and a new class of "retired members" has been formed, so that members retiring from active practice may, under certain conditions, be enabled to continue in their support of the Society.

With regard to

Architects' Registration,

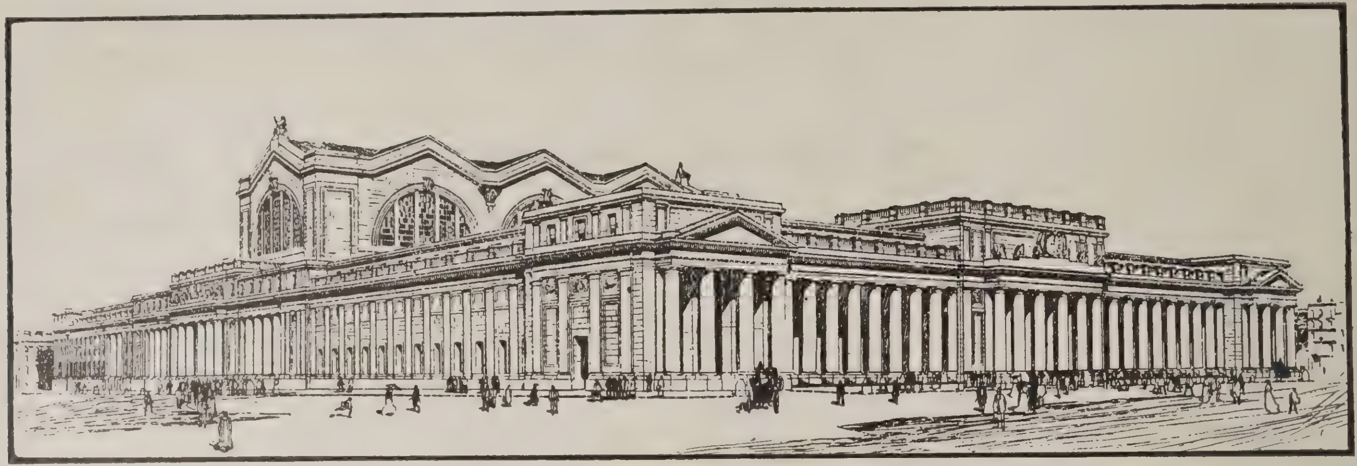
the council makes reference to the resolution in favour of it passed at the International Congress of Architects in July, which resolution was immediately communicated to the members of Parliament, and of the Society, with a view of obtaining their co-operation and support of the measure on its second reading. "Unfortunately the Bill was not reached and its further progress has been for the present delayed, but the council is in a position to say that the Bill has, this session, met with more support from members of the House of Commons than at any other period, and no effort has been or will be spared to secure the object which the council has in view. It may be of interest to know that a member of the Government, Mr. James Bryce, shortly after his speech at the Society's annual dinner, secured the adoption of a clause in the Irish Labourers' Bill, providing that every person whom a district council in Ireland proposes to employ as an architect for the purposes of the Labourers Act, must satisfy the Local Government Board that he is duly qualified to act in that capacity. This is the first instalment of registration, and every architect will be grateful to Mr. Bryce."

Other matters referred to in the report are—the growth of the students' section, due largely to the institution of the Society's travelling studentship of £25; new branches of the Society in Bombay and Johannesburg, the latter formed, the former not yet completed; and the finances of the Society, which are satisfactory.



COTTAGE AT HUTTON, NEAR BRENTFORD. C. S. F. PALMER, A.R.I.B.A., ARCHITECT.

This cottage has been built, with honeycombed rough-cast, roofs covered with local red tiles cesspool drainage, water supply from well. The accommodation on the first floor comprises four bedrooms, with box and cistern rooms. The architect was Mr. C. S. F. Palmer, A.R.I.B.A., of Wealdstone, and the builders were Messrs. Dix and Rodgers, of Brentwood.



General View of Station.

Notes on Competitions

Convalescent and Nurses' Home, Glossop.

For this building more than 90 designs have been received. Mr. Paul Ogden, F.R.I.B.A., of Manchester, is the assessor.

"Architectural Review" Alphabet Competition.

The designs submitted in this competition have been assessed and the awards will be announced in the November issue of the "Review."

List of Competitions Open.

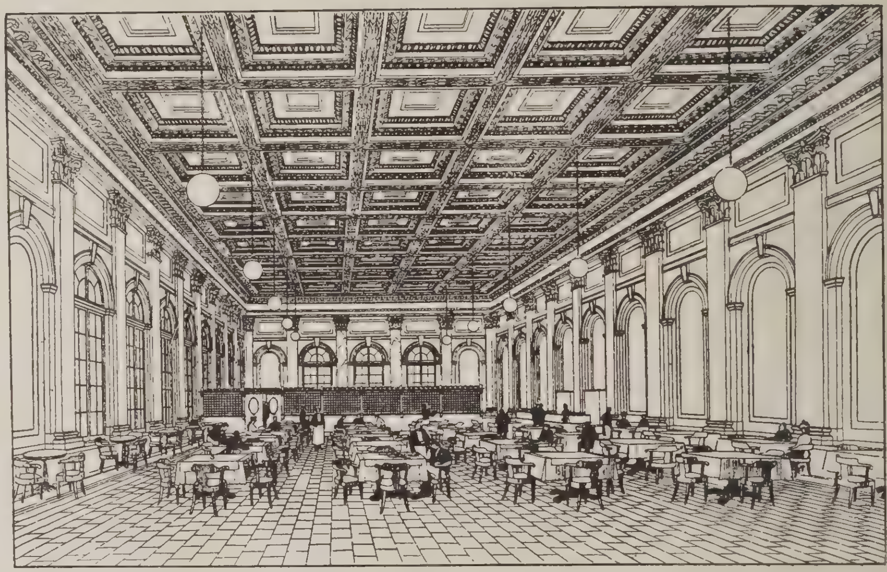
DATE OF DELIVERY	COMPETITION.
Oct. 20	SEWERAGE SCHEME FOR HIGHBRIDGE, Somerset. Premium £20. Particulars from W. C. Shier, Surveyor to the U.D.C., Highbridge.
Oct. 22	SCHOOL AT GAYWOOD, King's Lynn. Particulars from Secretary, County Education Office, 57, London Street, Norwich.
Oct. 31	BOURSE AT CAIRO.—Premiums of £E250 and £E100. International competition. Designs to be submitted to the "Corporation des Agents de Change," Cairo, Egypt.
Nov. 30	LIBRARY AT NEWTON-IN-MAKERFIELD.—Cost £4,000. Particulars from C. Cole, clerk to U.D.C., Town Hall, Earlestown, Lancs.
Dec. 14	FOUNDLING HOSPITAL, MONTEVIDEO.—Four selected designs in preliminary competition to be awarded £212 each; first premium of £742 in final competition. Particulars from Consulate-General for Uruguay, 5 & 6, Clement's Inn, London, W.C.
No date	LIBRARY AT FRIBOURG, Switzerland. (International competition.) Particulars from "La Direction des Travaux Publics," Fribourg.

NEW BUILDINGS IN LIVERPOOL.

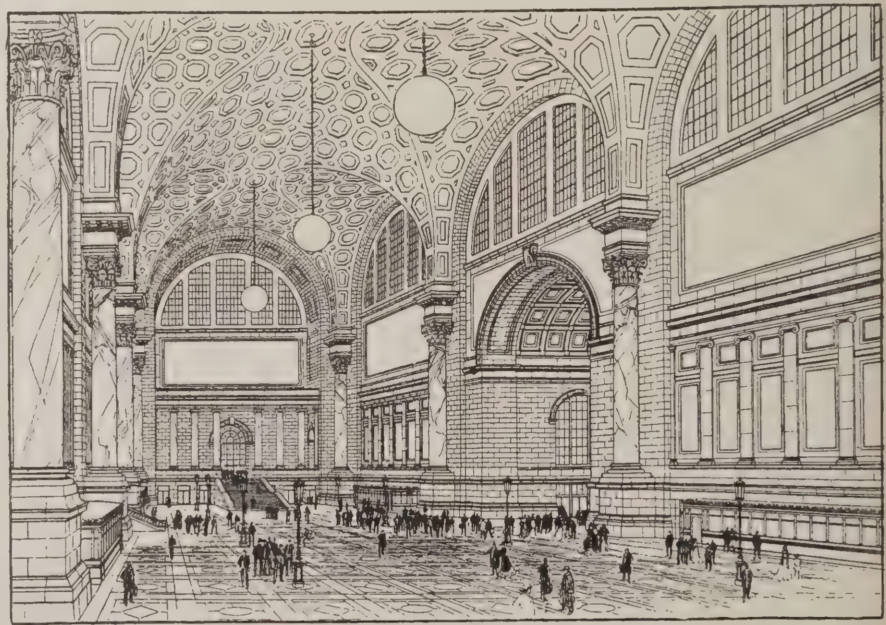
A Correction.

We very much regret that in the article on "New Buildings in Liverpool" published in our issue for last week it was stated (on what we believed to be trustworthy authority) that the architect of the excellent memorial of Renshaw Street Chapel was Mr. Thomas Shelmerdine, the corporation architect and surveyor. This is incorrect. It is true that the garden in which the memorial is situated was laid out by the corporation, but the memorial itself is the work of Mr. Ronald P. Jones, M.A., architect, of London.

With regard to the new offices for the Mersey Docks and Harbour Board, Messrs. Henry Hope & Sons, Ltd., of Birmingham and Manchester, request us to state that they supplied the steel sashes and opening gear for this building; also the metal casements and leaded lights in the new building for Messrs. G. H. Lee & Co.



The Restaurant.



The Waiting Hall.

NEW PENNSYLVANIA RAILROAD STATION, NEW YORK.
McKIM, MEAD AND WHITE, ARCHITECTS.

This huge new station is now in course of erection between Seventh and Ninth Avenues, 31st to 33rd Streets. It is admirably planned, while the above illustrations show that architecturally it should have a very fine effect. The waiting hall is the great feature. This is a very large place, with two restaurants placed at one side. Altogether the scheme has that "big" feeling about it so characteristic of Messrs. McKim, Mead and White's work.

Enquiries Answered.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional, or legal matters.

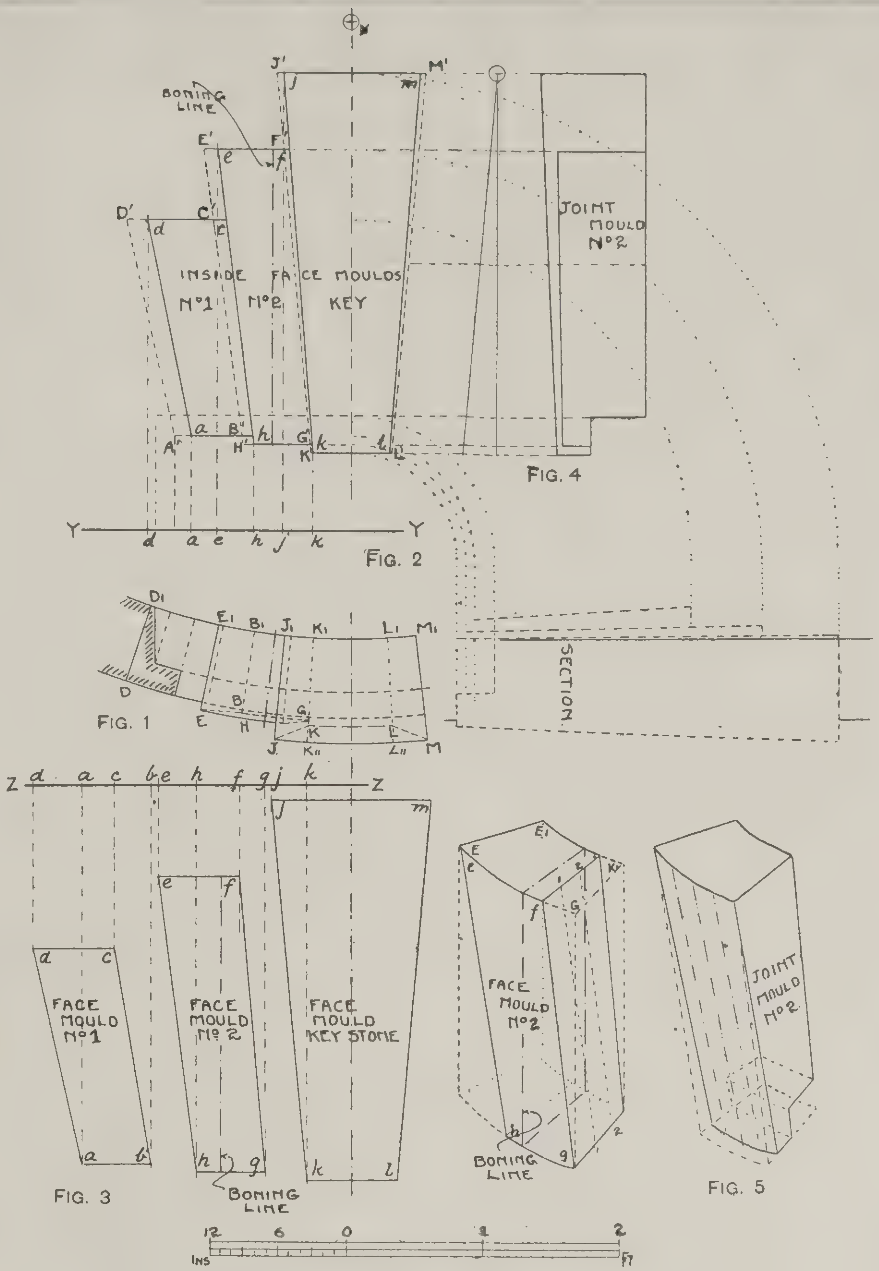
Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

American Roofings.

ABERDARE.—X. writes: "What kind of roofing is most in use in the United States? What patent roofings are used? Can you give an American address for fuller particulars?"

It is rather difficult to say what is the most common roofing material in America, as it is a question of quantity, but probably wood shingles are mostly in evidence, though the better class of property is now roofed with tiles, slates, or tinned sheets; the last-named is much used, both for smaller property and larger buildings in towns. Lead and copper are seldom employed. There is also a class of temporary roofing, such as Ruberoid, and bitumenised felt, and, of course, for flat concrete roofs, asphalt is adopted. Fuller particulars can be obtained from various firms, whose names and addresses you will find in "The Engineering Record," obtainable at Hastings House, Norfolk Street, Strand, W.C., price 6d.; "The American Architect," published at 12, West Fortieth Street, New York; and "The American Carpenter and Builder," published at 196, Fifth Avenue, Chicago.



CUTTING MOULDS FOR FLAT ARCH.

Cutting Moulds for Flat Arch.

SUNDERLAND.—MASON writes: "Please give a simple method of cutting moulds for and working a flat arch over a window on a curved face of a building. Tracing sent."

A plan of the arch is given in Fig. 1, and a section is shown by dotted lines on the right of the plan. An elevation is given in dotted lines on Fig. 2. In these figures essential lines only are shown, so as to avoid crowding. The face of voussoir No. 1 is flush with the wall face. This stone, therefore, lies wholly between the two cylinders forming the face and the back of the wall. The keystone and voussoir No. 2 lean outwards on the face, but at different angles: hence the face of stone No. 2 forms part of a cone, the axis of which coincides with that of the wall cylinder; the face of the keystone is also conical and has the same axial line as No. 2, but a different apex. To cut the moulds, develop the inner face of the arch on the stretch-out line marked YY. This may be done by pricking over the arc of the inner cylinder on plan with a pair of dividers, and plotting the points on YY, as shown in Fig. 2. Project these points up to the elevation and join by means of straight lines. (*See Note No. 2 below.*) The solid lines shown in Fig. 2 represent the development of the inside face moulds. To obtain the mould for the outside face, a stretch-out line is drawn below the plan ZZ. Develop the moulds as before described, each stone being treated as a portion of a cylinder containing the top front arris. The keystone will thus be developed on cylinder or arc of circle marked J M on plan; the soffit lines being produced to the arc in K11, L11. Voussoir No. 2 will be developed on the arc of circle EF, soffit lines being produced as before. Voussoir No. 1 will be developed on the wall face. D B B1 D1 show the extreme points of the bed mould for voussoir No. 1. E E1 K1 and G, produced to the extreme circle, is the bed mould for voussoir No. 2. J M M1 J1 are the extreme points of bed mould of keystone. Bed moulds of the soffits of keystone and No. 2 stone would be required and may be taken direct from the plan. Joint moulds would be required to work the inclined faces of keystone and voussoir No. 2. These are easily projected from the inside development of arch as shown in Fig. 4. To work the stones, rough sketches are given of voussoir No. 2 at two stages of the working. Top and bottom beds are first worked. The bed moulds are then applied (being boned to ensure correct position), the inside cylindrical surface worked, and the outside cylindrical surface boasted sufficiently near to apply the face mould. The joints which are slightly twisted can then be worked. Joint moulds can then be applied and the conical face worked, check out for frame being the last operation. The other stones can be worked in a similar manner. Notes.—(1.) The face moulds may be made on tangent planes, instead of cylindrical surfaces; and this would perhaps be a little more economical; but the writer is of opinion that the method here shown is the simplest to follow. (2.) The front and back arrises of the stones, being made straight in development, are not straight in reality, nor in elevation, but curved; the curvature, however, is very little. (3.) The dotted lines shown on the face of stone in Fig. 5 serve as guides when drafts are being worked. They are not actually generators of the cone, but may be worked to a straight edge without causing material error.

G. R. B.

National Competition Report.

SCARBOROUGH.—F. F. writes: "Where can I get a report of the South Kensington National Competition of the schools of art, and what is the price?"

The report of the judges on the works submitted in the National Competition can be obtained on application to the secretary, Board of Education, South Kensington. The price of it, we believe, is about 6d.

Notes and News

The Bangour Village Asylum, near Edinburgh, was opened by the Earl of Rosebery last week. The architect is Mr. Hippolyte J. Blanc, of Edinburgh.

A Statue of the late Duke of Cambridge is proposed to be erected in front of the new War Office in Whitehall. The pedestal has been designed by Mr. John Belcher, A.R.A.

New Premises of the Scottish Temperance Life Assurance Company have been erected at the eastern end of Newgate Street, London. The building was formally opened on Thursday last.

The Liverpool Architectural Society held its opening meeting of the session on Monday evening, when an inaugural address was delivered by the president, Mr. Edmund Kirby, F.R.I.B.A.

Liverpool's Building Surveyor.—The Liverpool City Council has appointed Mr. J. T. Alexander city building surveyor in succession to Mr. William Goldstraw, who recently resigned the position on superannuation.

New Holloway Infirmary.—It is proposed shortly to commence the construction, at a total estimated cost of £12,000, of a new male infirmary in connection with the present sanatorium at Holloway. Mr. R. Weir Schultz is the architect.

"The Local Government Officer."—The "Public Health Engineer" has been incorporated with this weekly, price 3d. All questions of local government are dealt with in its columns. It is well produced and should be widely read.

Disparity in Tenders.—Considerable difference in the amount of tenders for painting the railings at the Fulham Workhouse recently gave rise to some comment among the Guardians. The lowest tender was £394, and the highest £1,057.

A New Infectious Diseases Hospital is to be erected at Stranraer by Messrs. Spiers and Sons, of Glasgow. The cost of the work, which is to be proceeded with at once, will be between £3,000 and £4,000. Mr. Alexander Thorburn, of Stranraer, is the architect.

A Substitute for Water Carts.—According to the "Liverpool Post," a German town is about to make an experiment with perforated pipes run along the streets by the side of the curb. When needed, the roadways can be sprayed from these pipes, which thus take the place of water-carts.

A New Wing to the Durham University College of Medicine at Newcastle-on-Tyne was opened last week. The new wing has cost £11,000, and extends along the west side of the building, 119ft. in length. The architects were Messrs. Dunn, Hansom & Fenwicke, of Newcastle, and the contractor Mr. Lumsden, of Jarrow.

A Screen by Mr. Bodley.—Lord Burton, in addition to defraying the cost—£700—of reconstructing the organ of St. Paul's Church, Burton-on-Trent, of which he is patron, has instructed Mr. G. F. Bodley, R.A., to design a new screen of wrought iron, richly ornamented, to occupy the arch in the north transept near the pulpit.

New Promenade at Edinburgh.—In Princes Street Gardens, Edinburgh, a wooden model of the proposed new promenade to be formed there, in connection with a widening scheme, has just been erected. It is 50ft. long and 25ft. wide, and will be left standing for about a month in order that the citizens may form an idea of what the promenade would be like.

Lectures on Architecture at London University.—The University of London has started a three years' course of public illustrated lectures on "The History of Architecture," by Mr. Banister Fletcher, F.R.I.B.A. The lecture on "Egyptian Architecture," illustrated by lantern slides, was given on Monday, October 8th, in the University Buildings, Imperial Institute Road, South Kensington.

Changes of Address.—Messrs. Buckland & Haywood-Farmer, architects and surveyors, have moved from 25a, Paradise Street, to Norwich Union Chambers, Congreve Street, Birmingham. — Mr. Frank T. Baggallay, F.R.I.B.A., architect and surveyor, has removed from 50, Berners Street, W., to 3, Bloomsbury Street, W.C.—Mr. T. H. Russell, M.A., architect, has also moved from Berners Street to 3, Bloomsbury Street.—Mr. Henry F. Joel, A.M.I.C.E., consulting electrical engineer, has moved from 31, Wilson Street, E.C., to 110, Strand, W.C.

Old Bristol.—A representative committee of the Bristol Corporation has decided to recommend that the historic Dutch house, a familiar landmark in the centre of the city, shall be preserved. A proposal was made some time ago to demolish it for street improvement purposes. The committee recommend that the ground floor be set back to the new line of the street, and the upper floors restored, the building to project over the pavement.

A New County Asylum is to be erected at Mile End, near Colchester, at an estimated cost of £438,850. The accommodation provided in the buildings is as follows:—Main buildings, males 610, females 716; detached buildings, males 324, females 350; total, 2,000, with accommodation for 225 attendants and about 30 servants. The estimated cost of the works, including all buildings, heating and ventilation, lighting, water supply, drainage, roads and tanks, will be about £220 per bed—a total cost of £438,850.

New Hydro at Peebles.—The rebuilding of the hydropathic establishment at Peebles, which was destroyed by fire in July last year, is being rapidly pushed forward. The new structure is being erected from designs by Mr. James Miller, A.R.S.A., Glasgow. The grand corridor, which is 210 feet in length, will, as formerly, make, with the conservatory, a promenade more than 300 feet long. The cost of building, furnishing, and equipping is estimated at about £100,000. It is expected that the new building will be open by Easter next.

Extensive Salvation Army Building Scheme.—In order to meet the need of suitable premises for their purposes in the great cities, the Salvation Army propose to erect 250 new halls within the next five years. Sixty are now in course of erection. In London 20 buildings have been recently or are about to be erected, and before the end of 1907 the Army expect to add 40 new buildings within Greater London. Projects are also on foot for erecting at least 20 buildings in Glasgow before the end of 1907, while buildings are also about to be commenced in the following towns: Lancaster, Hull, Wakefield, Eccles, Garston, Rothwell (Yorks.), Ware, Morley, Wandsworth, Abertillery, Ashton-under-Lyne, Maerdy, Galashiels, Paisley, East Ham, Ilkeston (Y.P.), Springburn, Shipley (Y.P.), Lerwick, Hull (Y.P.), Bury, Carnforth, Pollokshaws, Cleckheaton, Lewisham (extension), West Norwood, Hucknall, Rowborough, Williamstown, Shettlestone, Derby, Thornton Heath, Clapton Common, Folkestone (Y.P.), Bo'ness, Scunthorpe, Child's Hill, Bromley, St. Albans, Coltishall, Broughton, Bexley Heath, Snodland, Widnes, Bulwell, Acton, Dartford, Doncaster, Belfast, Dorking, Leeds (Y.P.), Maidenhead, Hylton and High Wycombe. The erection of these halls should give an impetus to the building trade in the towns concerned.

The Common Fate.—As it is the common fate of all theatres—especially of American theatres—to burn sooner or later, there are comparatively few that ever reach a venerable age. Just why the Savannah Theatre, at Savannah, Ga., escaped the common lot for nearly ninety years, we know as little as we know why it succumbed at last; but the fact that an American theatre built in 1818 was not burned down until 1906 deserves at least this record.—"American Architect."

Our Plates

House at Southport.

This house is now in course of erection in Hesketh Road, Southport. The walls are covered with white rough-cast, and the windows, &c., dressed with Alderley Edge stone in deep reveals. The roofs are covered with red sand-faced tiles. The building is placed on the site regardless of being parallel with the road, so as to obtain the sun in the best rooms—a feature that is intended to be general hereabouts. This is one of several houses erected in this vicinity by the architect, Mr. A. Jessop Hardwick, F.R.I.B.A., of Eagle Chambers, Kingston-on-Thames. The work is being carried out by the owner of the property.

Group of Country Homesteads.

These little houses were designed to form a country retreat for three friends who wished to live together, but to occupy separate dwellings. The plans consist of a kitchen, or living-room, and a parlour which could be used as a study, with three bedrooms over. The materials proposed to be used are plastered walls, with an undulating trowelled surface whitened, a plinth course of 2in. Dutch hand-made bricks (5 courses to the foot), the chimney stacks to be carried up in the same brick, and the roof to be covered with thick hand-made red and brown tiles: window casements to be of iron with wood frames; all external woodwork to be painted dull peacock green, and internal work cream; gutters to be formed V-shape of elm, with lead lining turned over the edge. The design has been kept simple so that the cost should not exceed £300 each house, and an attempt has been made to carry on the best traditions of the simple country homesteads which are so characteristic a feature of English scenery. The architect is Mr. Alex. S. Carter, of 2, Upper Woburn Place, Tavistock Square, W.C.

New London Buildings

At yesterday's meeting of the London County Council the Building Act Committee reported the following applications under the London Building Act, 1894, their recommendations as to consent or refusal being appended in *italics*:

Projecting porch in front of No. 10, Lettice Street, Fulham, on the application of Lowndes and Drury. (*Consent.*)

Wood and tile porches to four houses on the west side of Finchley Road, Hampstead, between Ardwick Gardens and Burgess Hill, and to two houses on the south-east side of Burgess Hill, on the application of J. D. Hunter, on behalf of R. V. Hart. (*Consent.*)

Projecting shop front to No. 134, High Street, Notting Hill Gate, Kensington, on the application of C. Spreckley & Co., on behalf of A. Leber. (*Consent.*)

Addition at the rear of No. 8, Coleherne Road, West Brompton, abutting upon Wharfedale Street, on the application of A. G. Harfield, on behalf of G. F. Webb. (*Consent.*)

Porch in front of a house in Oakcroft Road, Lewisham, on the application of E. W. Leeson, on behalf of A. B. Bacon. (*Consent.*)

Buildings with shops on the site of Nos. 188 to 198A (even numbers only) inclusive, Great Portland Street, St. Marylebone, so far as regards the frontage of such buildings to Great Portland Street, on the application of D. Brown, on behalf of R. Mickel & Co. (*Consent.*)

Porches and oriole windows and the fixing of sham half-timber work to 58 houses in Trinity Road, Herne Hill, and to 57 houses in a new street to lead from Trinity Road to Norwood Road, on the application of C. M. Quilter, on behalf of T. L. Searon. (*Consent.*)

Temporary buildings on the northern side of Harrow Road, between Ranelagh Road and Westbury Road, on the application of T. J. Bailey, on behalf of the Education Committee of the Council. (*Consent.*)

Re-erection of the "Duke of Sussex" public-house, abutting upon Commercial Road and Lower Park Road, Peckham, and erection of four houses adjoining, on the application of Hubbard and Moore, on behalf of Barclay, Perkins & Co., Ltd. (*Consent.*)

Two houses with shops on the north side of Evelina Road, Nunhead, on a site between Kirkwood Road and Grimwade Crescent, on the application of N. Pellew. (*Consent.*)

Bay window, and a hood to the doorway, at the proposed new guardians' offices, Prince's Row, Buckingham Palace Road, on the application of F. J. Smith, on behalf of the guardians of the parish of St. George, Hanover Square. (*Consent*).

Projecting iron and glass portico and shelter to the proposed "Hotel Gwalia," on the site of Nos. 11A and 11B, Upper Woburn Place, St. Pancras, on the application of A. Swash, on behalf of J. M. Jenkins. (*Consent.*)

One-storey shops on part of the forecourts of No. 291 to 301 (odd numbers only) inclusive, Cavendish Road, Balham, on the further application of J. H. Beare, (*Consent.*)

One-storey building in front of No. 101, New Church Road, Camberwell, on the application of J. Richards, on behalf of Trier Brothers. (*Refusal.*)

Shops and flats on a site on the eastern side of Askew Road, Hammersmith, to the northward of No. 264, Goldhawk Road, on the application of M. de H. Duval. (*Refusal.*)

Nineteen houses on the north-east side of Moyser Road, Streatham, on the application of F. Loveday. (*Refusal.*)

Urinal at the "Duke of Wurtemberg" public-house, and the retention of a brick wall at less than the prescribed distance from the centre of Brunswick Place, Hatfield Street, Southwark, on the application of H. W. Budd, on behalf of J. Bartlett. (*Consent.*)

One-storey building on the western side of Sugden Street, Camberwell, to abut also upon Depot Street, at less than the prescribed distance from the centres of the roadways of the said streets, on the application of A. E. Biggs, on behalf of S. Lamb. (*Refusal.*)

Buildings on the northern side of Sangley Lane, Catford, abutting upon Plassey Road, on the application of Wilson & Wilkinson, on behalf of T. Buckland. (*Refusal.*)

Four-storey building on the site of Nos. 761 and 763, Old Kent Road, Peckham, on the application of W. Cooper. (*Refusal.*)

Oriel window and iron jib at No. 6, Stanhope Street, St. Pancras, on the application of J. Webster, on behalf of Miss C. C. Ayres. (*Refusal.*)

Twelve houses on the western side of Hither Green Lane, Lewisham, between Brownhill Road, and Sandhurst Road, on the application of H. L. Upham, on behalf of A. Wood & Son. (*Consent.*)

Building on the site of Nos. 11A and 11B, Upper Woburn Place, St. Pancras, at less than the prescribed distance from the centre of Woburn Buildings, on the application of A. Swash, on behalf of J. M. Jenkins. (*Consent*)

New fire brigade station on the site of No. 1A, Hertslet Road, Nos. 80, 82 and 84, Mayton Street, Holloway, and the existing fire brigade station in that street, on the application of O. Fleming, on behalf of the Fire Brigade Committee of the Council. (*Consent.*)

Deviations from the plan certified by the district surveyor so far as relates to the proposed re-erection of No. 78, Wigmore Street, St. Marylebone, on the application of Treadwell and Martin. (*Refusal.*)

Formation of new street for carriage traffic on the Cavendish House estate, Clapham Common, to lead from Cavendish Road to Clapham Common, south side, on the application of T. Young, on behalf of the Cavendish House Estate Co., Ltd. (*Consent.*)

Widening of Wallis's Yard, Prince's Row, Buckingham Palace Road, on the application of F. J. Smith, on behalf of the guardians of the parish of St. George, Hanover Square. (*Consent.*)

Formation of two new streets for carriage traffic out of the south side of Southcroft Road and a new street for carriage traffic out of the east side of Mitcham Road, Tooting, on the application of Milner, Son & White. (*Consent.*)

Re-erection of the "White Horse" public-house, at the corner of Central Street and Paton Street, Finsbury, on the application of Hubbard and Moore, on behalf of A. E. Ball. (*Consent.*)

Boys' Home on the north side of Great Wild Street, Holborn, on the application of E. Runtz and Ford, on behalf of W. Wheatley and others, (*Consent.*)

Two buildings on the north side of Evelina Road, Nunhead, on application of N. Pellew. (*Consent.*)

Additional rooms over the stables at the rear of No. 81, Eaton Square, on the application of G. Trollope & Sons and Colls & Sons, Limited. (*Consent.*)

Ten houses on the east side of Latimer Road, Hammersmith, on the application of M. Minkler. (*Refusal.*)

Iron and concrete building at St. David's Wharf, West Ferry Road, Millwall, on the application of T. A. Watson, on behalf of the Manganese Bronze and Brass Co. (*Refusal.*)

Timekeeper's office, store, iron gangway across stokers' pit, and wooden folding doors across the western end of the existing drum store at the Osborn Street generating station, Whitechapel, on the application of M. W. Jameson, on behalf of the Stepney Metropolitan Borough Council. (*Consent.*)

Re-erection of the "Duke of Sussex" public-house at corner of Commercial Road and Lower Park Road, Peckham, on the application, dated July 11, 1906, of Hubbard and Moore, on behalf of Barclay, Perkins & Co. (*Consent.*)

Three dwelling-houses on land between Claremont Place and Wells Tenements, Lower Road, Rotherhithe, on the application of Stock, Page & Stock, on behalf of the Trustee of the Gomm Estate, Rotherhithe. (*Consent.*)

Buildings abutting on Red Lion Court, Fleet Street, on the application of Griffin and Woollard, on behalf of A. Rust. (*Consent.*)

Residential flats on a site abutting upon Seymour Street, Edgware Road and Connaught Mews, Paddington, on the application of D. Brown, on behalf of Lady E. R. Hope. (*Consent,*)

Projecting architectural features in front of the northern and western sides of Nos. 1 and 2, Royal Exchange Buildings, Cornhill, on the application of Ernest George and Yeates, on behalf of the Union Assurance Society. (*Consent.*)

Porches to Nos. 19 to 25, Ruskin Walk, Herne Hill, on the application of W. Wilkinson, on behalf of F. J. Handford. (*Consent.*)

Projecting one-storey shop in front of No. 160, Uxbridge Road, Hammersmith, on the application of A. E. Hyams, on behalf of A. Eyres. (*Consent.*)

Bay window in front of No. 101, Alexandra Road, St. John's Wood, on the application of R. Banks-Martin, on behalf of J. Salamon. (*Consent.*)

Building on the eastern side of Gray's Inn Road, southward of Clovelly Mansions, on the application of E. J. Edwards, on behalf of the Highways Committee of the Council. (*Consent.*)

Retention of a projecting iron and glass hood over the entrance to No. 4, Percy Villas, Campden Hill, Kensington, on the application of W. Wallis Baldwin, on behalf of the Alliance Economic Investment Co. (*Consent.*)

Projecting sign in front of No. 9, Young Street, Kensington, on the application of J. W. Lawson. (*Consent*).

Addition in front of No. 2, Moreton Gardens, Gilston Road, Kensington, on the application of C. G. F. Rees, on behalf of C. E. Melchers. (*Consent.*)

Four one-storey shops in front of a portion of the "Priory," between Nos. 408 and 418, High Street, Lewisham, on the application of R. C. Fry, on behalf of W. J. Larke and H. O. Larke. (*Consent.*)

Two one-storey shops in front of Nos. 436 and 438, High Street, Lewisham, on the application of R. C. Fry, on behalf of W. J. Larke and H. O. Larke. (*Consent.*)

Iron and glass covered way at No. 20, St. John's Wood Road, St. Marylebone, to abut upon Grove Road, on the application of A. W. G. Harding, on behalf of I. E. Winslow. (*Consent.*)

Projecting sign at No. 49, Wigmore Street, St. Marylebone, on the application of W. Garstin & Sons. (*Consent,*)

Projecting portico in front of No. 71, Portland Place, St. Marylebone, on the application of Fair & Myer, on behalf of G. A. Cohen. (*Consent.*)

Additional storey over an existing one-storey portion in front of No. 2, Elm Tree Road, St. Marylebone, on the application of Howard Ince. (*Consent.*)

Porches in front of Nos. 57 to 75, Danecroft Road, Herne Hill, on the application of F. J. Goddard. (*Consent.*)

Projecting portico in front of No. 38, Grosvenor Place, St. George, Hanover Square, on the application of R. G. Hammond, on behalf of J. Garlick. (*Consent.*)

Two projecting oriel windows and two projecting pilasters at No. 7, Dering Street, St. George, Hanover Square, on the application of H. Kennard. (*Consent*)

Projecting sign at No. 195, Wardour Street, Oxford Street, Strand, on the application of R. Angell, on behalf of N. Bu t & Co., Ltd. (*Consent.*)

Side additions to the existing porch in front of No. 10, Carlton House Terrace, on the application of Detmar Blow & F. Billerey, on behalf of the Right Hon. the Viscount Ridley. (*Consent.*)

Bringing forward the frontage of No. 143, Piccadilly, and the erection of a porch and balcony in front of such building, on the application of R. S. Wornum, on behalf of W. B. Huntingdon. (*Consent.*)

Buildings upon the site of Nos. 338, 340, 342 and 344. Walworth Road, Walworth, on the application of G. A. Lansdown, on behalf of Grose Brothers, Ltd. (*Consent.*)

Porches and oriels in front of Nos. 1, 2, 3 and 4, Braxted Park, Streatham, on the application of P. C. Davies. (*Consent.*)

Three houses on the southern side of Ensham Street, Mitcham Road, Wandsworth on the application of C. G. Baker, on behalf of S. Sinclair. (*Consent.*)

Projecting one-storey shops in front of Nos. 240 to 252, Mitcham Road, Wandsworth, on the application of A. K. Stephens, on behalf of Robertson & Barrie. (*Consent.*)

Bay windows in front of Nos. 19, 21, 23 and 25, Beechhill Road, Eltham, on the application of J. J. Bassett, on behalf of A. Cameron-Corbett. (*Consent.*)

Projecting one-storey shops in front of Nos. 49 and 51, Queen's Road, Dalston, on the application of Young Bros., on behalf of W. oiteux & W. Laing. (*Refusal.*)

One-storey addition at No. 81, Micheldever Road, Lee, abutting upon Manor Lane on the application of G. A. Lansdown, on behalf of W. J. Scudamore & Sons. (*Refusal.*)

Two houses on the north-western side of Herne Hill, Norwood, to abut also upon Poplar Walk, on the application of W. Wilkinson. on behalf of F. J. Handford. (*Refusal.*)

One-storey shops in front of Nos. 90 and 92, Mitcham Lane, Streatham, on the application of Alder and Turrill, on behalf of the Rev. F. Bedale and H. W. Grose. (*Refusal.*)

Buildings upon site of Nos. 294, 296, 208 and 300, St. John Street, and Nos. 1 and 2, Rawstorne Street, Clerkenwell, on the application of A. Kent, on behalf of G. E. Chamberlain. (*Consent.*)

Boiler seating and chimney shaft at the Walham Green Laundry, Fulham Road, on the application of R. Froude Tucker, on behalf of Laundries, Ltd. (*Consent.*)

Building on the western side of Blomfield Street, Dalston, with the forecourt boundary at less than the prescribed distance from the centre of the roadway of such street, on the application of A. Wood Hill, on behalf of the North London Railway Co. (*Consent.*)

Working-class dwellings on eastern side of Lisson Street, St. Marylebone, abutting upon Mitcham Street, to a height exceeding the width of Mitcham Street, on the application of W. Lockwood, on behalf of Lt.-Col. Sandys, M.P. (*Consent.*)

Urinal on the south side of Marlborough Street, Harrow Road, Paddington, at less than the prescribed distance from the centre of the roadway of such street, on the application of E. B. B. Newton, on behalf of Paddington Metropolitan Borough Council. (*Consent.*)

Six blocks of flats on the western side of Brook Green, Hammersmith, on the application of R. Wilson, (*Consent.*)

Projecting portico in front of No. 7, Compton Terrace, Highbury, on the application of Robinson and Roods, on behalf of Dr. Beauchamp Hall. (*Consent.*)

Wood and iron building of a temporary character at the rear of Nos. 28 and 30, Engleheart Road, Catford, and abutting upon Sangley Road, on the application of Norfolk & Prior, on behalf of Hayden, (*Consent.*)

Building to be known as The German Sailors' Home, on a site abutting upon Rich Street. Beccles Street, and West India Dock Road, Limehouse, on the application of G. Waymouth, on behalf of Sir J. W. Schroder, Bart. (*Consent.*)

Building on the site of Nos. 14, 15 and 16, Cockspur Street, and Nos. 8, 10, 12 and 14, Warwick House Street, Strand, on the application of Stock, Page and Stock, on behalf of the Direction der Disconto-Gesellschaft. (*Consent.*)

Building and a forecourt fence on the western side of Willow Vale, Uxbridge Road, at less than the prescribed distance from the centre of the roadway of such street, on the application of L. J. Williams, on behalf of W. I. Friend. (*Refusal.*)

Additions at the rear of No. 84, King Street. Hammersmith. to abut upon Mansion House Street, on the application of A. F. Hunt. (*Refusal.*)

Buildings on the western side of Vicarage Road, Plumstead, northward of No. 18, on the application of J. Wernham. (*Consent.*)

Retention of No. 82, Brady Street, Bethnal Green, with an irregular open space at the rear, on the application of J. Holmes. (*Consent.*)

Proposed erection of Nos. 37 and 39, Atherfold Street, Stockwell, on the application of V. Vagnolini, on behalf of W. P. Goosey. (*Consent.*)

Addition at rear of No 20, Elvaston Place, Kensington, on the application of F. C. Eden, on behalf of R. Martin-Holland. (*Consent.*)

Addition at rear of Euston fire-station, Euston Road, on the application of O. Fleming, on behalf of the Fire Brigade Committee of the Council. (*Consent.*)

Building on the western side of Hampstead Road, St. Pancras, on the application of Joseph and Smithem, on behalf of the London and North Western Railway Co., Ltd. (*Refusal.*)

Retention of a wood and glass showcase on the forecourt of No. 54, Mare Street, Hackney, on the application of Hinton & Co. (*Consent.*)

External iron and concrete gangway across King John's Court, Great Eastern Street, Hoxton, on the application of T. H. Smith, on behalf of Brown Brothers. (*Consent.*)

Iron gangway across High Street, Wapping, on the application of J. M. Kennard, on behalf of Butler's Wharf, Ltd. (*Consent.*)

Iron and glass shelter at the Grand Theatre, Woolwich, to abut upon Wellington Street and Lower Market Street, on the application of B. Crewe. (*Consent,*)

External iron staircase in front of No. 7, McDermott Road, Peckham, on the application of H. R, Sayer, on behalf of W. D. Crowhurst. (*Refusal.*)

Formation of a street between six blocks of buildings proposed to be erected upon a site on the western side of Brook Green, Hammersmith, on the application of R. Wilson. (*Consent.*)

Formation of a new street for carriage traffic, to lead from Brixton Hill to Lyham Road, Norwood, on the application of Douglas Young and Co., on behalf of F. W. E. Hookey, W. J. Peall, W. T. Key and R. W. Brading. (*Consent.*)

Formation of a new street for carriage traffic on the Sanders estate, to lead from Herne Hill Road to a proposed street to be known as Ruskin Park, Denmark Hill, on the application of R. Ellis & Son, on behalf of R. A. Sanders. (*Consent.*)

Formation of three new streets for carriage traffic to lead out of the south side of Lancaster Road, West Norwood, on the application of C. J. Bentley. (*Consent.*)

Two cooling towers on the south-western side of Burnard Place, Islington, on the application of A. Gay, on behalf of the Islington Metropolitan Borough Council. (*Consent.*)

Station buildings on the northern side of St. John's Hill, Battersea, on the application of C. L. Morgan, on behalf of the London, Brighton and South Coast Railway Co. (*Consent.*)

(Remainder held over till next week.)

NEW WORKS IN SCOTLAND.

An Important Scheme.

Some little time ago the British Aluminium Co., Ltd., having obtained the necessary parliamentary authority to utilise the waters of the West Highlands for mechanical purposes, placed a contract for the erection of new works and village at Kinlochleven, on the borders of Inverness and Argyllshire, with Messrs. M'Laughlin & Harvey, Ltd., of Belfast, Dublin and London, who are also engaged in making large additions to the company's works at Larne Harbour, where the alumina is extracted from the ore. The architects for both schemes are Messrs. W. J. Morley & Son, of Bradford and London.

The Kinlochleven scheme comprises a reservoir, a high-level conduit, a pipe track, and the power house. The reservoir will be about 7½ miles in length, with an average width of more than half a mile, and, when completed, will probably have the largest capacity of any artificial reservoir in Europe. It will obliterate three small lakes, and its approximate capacity will be about 20,000,000,000 gallons. There will be a concrete masonry dam more than half a mile long, its height at the centre being about 80ft. From here the water will be led through a conduit along the hill-face for a distance of about three and a half miles to the head of the pipe line. The conduit will be 8ft. square, built entirely of reinforced concrete, and roofed over with slabs of the same material. The total fall in the conduit is about 20ft. To the power-house the water is to be taken in half a dozen steel pipes of 39in. diameter, and will be delivered to the turbines under a head of more than 900ft.

A short distance west of the site of the power-house, and adjoining Loch Leven, is the site of the model village for the employees. In addition to 200 dwelling houses, there will be the necessary shops, a church, post-office, school, and hospital, so that in a year or two this at present somewhat inaccessible region will be occupied by a fairly numerous industrial community.

With a view to expediting the transport of the necessary plant and materials, the contractors have erected an aerial ropeway between their wharf on Loch Leven and the dam, a distance of about five miles, while for the conveyance of heavy machinery an overland route has been laid down, steep portions being worked by wire-winding winches.

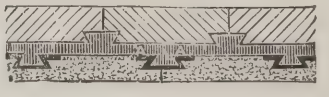
The cost of the undertaking will probably exceed half a million sterling, and the period of construction is estimated at about three years. The engineers for the scheme are Messrs. Thomas Meik & Sons, of London and Edinburgh, and the contract for the reservoir, conduit, dam and pipe track has been let to the firm of Sir John Jackson, Ltd.

Bournemouth's Municipal Buildings Scheme.—At the last meeting of the Bournemouth County Borough Council the new municipal buildings scheme was discussed. The Horse Shoe site has been abandoned and the committee has now been instructed to find another site, the scheme meanwhile being shelved. The joint architects are Messrs. C. E. Mallows and F. W. Lacey, to whom, it was agreed, £500 should be paid on account of out-of-pocket expenses.

Trade and Craft.

Finishing Concrete Floors.

We have referred in an article on the finishing of concrete floors in our "Concrete and Steel Supplement" in this issue to the troubles that moisture causes in wood-block floors. A method has been invented which certainly seems to overcome a great deal of the difficulty of securing a satisfactory wood-block floor. This system is not a new one, but has now been in use for more than 20 years. It is Ebner's "Hydrofuge" system. This has secured a number of gold medals at international exhibitions, and about 1,000,000 yards super have been laid. The system is clearly illustrated in the small sectional diagram here reproduced. Iron channels are embedded in and upon the top of the concrete 12ins. apart. A layer of bitumen is then laid on the concrete and entering into these channels. Finally, upon all come the blocks, which, as will be seen, have their edges cut to a groove which forms a dovetail into which the bitumen penetrates. The bitumen, being thus keyed into both the concrete and wood blocks, holds down the latter.



The method of executing the work is simply to embed the above-mentioned iron channels in the floating coat of the concrete while it is plastic. When this floating is thoroughly set and dried, a hard-setting bitumen, made hot so as to become liquid, is poured upon the surface of the concrete a little at a time, just sufficient to serve for two or three blocks. The wood blocks are then pressed down upon the bitumen before it cools. The bitumen should be kept to a uniform thickness of about $\frac{1}{8}$in. to $\frac{1}{4}$in. A staff of three men can lay such a floor at the rate of 100ft. super. per man per day and completely finished, including polishing, at the rate of 60ft. super. per day. This method is carried out by Mr. J. F. Ebner, of 150, Old Street, St. Luke's, London, E.C. Mr. Ebner also executes floors in terrazzo and in parquet, and he has also more recently placed his "Ebnerite" upon the market, this being the name he gives to a method of finishing concrete floors with a material composed of wood fibre, fine mineral powder and a cementing liquid, laid in a plastic state with a trowel, and solidifying in about 35 hours. It can be used either rough or polished, oiled and beeswaxed like a parquet floor.

The Paving of Whitehall.—At last Thursday's meeting of the Westminster City Council the Works Committee submitted a report on the paving of Whitehall, in which they stated that large quantities of defective blocks had been delivered on the streets and had been rejected by the city engineer. Notwithstanding these wholesale rejections, however, the contractors, the Acme Flooring and Paving Company, 1904, Ltd., continued to deliver and use blocks of a similar or worse character. A resolution was passed empowering the Committee to take steps to obtain the execution of the paving works referred to in the contract which the company had failed to execute, and to enter into other contracts, charging the company with any increased cost which the Committee might necessarily incur.

Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, *Great New Street, Fetter Lane, E.C.*

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Dedham (Essex).—For drainage works for the Lexden and Winstree R.D.C. Messrs. Sands and Walker, engineers, Milton Chambers, Nottingham:—

T. C. Thompson, Upminster ...	£3,849	7	0
W. H. Hill, Flamborough	3,763	0	0
N. Saunders & Son, Dedham ...	3,730	0	0
F. C. Thurman...	3,490	0	0
T. Parkington & Son	3,350	0	0
H. Brown, Watford	3 270	0	0
G. Double	3,241	6	6
F. Bennett...	3,211	15	6
G. Burgoyne	3,138	5	0
Wilson, Border & Co.,* Romford	3,123	16	4
E. Saunders, Dovercourt (withdrawn)...	2,989	0	0

*Accepted. (Rest of Ipswich.)

Hereford.—Accepted for the erection of three villa residences on the Moor Park estate. Mr. Herbert Skyrme, architect, 138, Widemarsh Street, Hereford:—

William Powell, Hereford	£1,250

Hounslow.—For the erection of proposed new infants' school (350 places) in Spring Grove, for the Heston and Isleworth U.D. Education Committee. Mr. A. Lancelot Lang, architect, Council House, Hounslow. Quantities by architect:—

Parfitt & Co., Willesden	£4,847	0	0
Burfoot & Son, Windsor	4,637	0	0
E. Carter, Hounslow	4,631	7	4
Hughes & Stirling, Strand, W.C.	4,605	0	0
H. Haynes, Wembley	4,599	0	0
A. Cutler & Sons, Hounslow ...	4,574	0	0
C. Gray, Shepherd's Bush	4,517	0	0
F. & G. Foster, Norwood Junction	4,496	0	0
W. Lacey, Hounslow	4,440	0	0
T. J. Nichols, Chiswick...	4,420	0	0
H. Harris & Son, Marlow	4,360	0	0
Lawrence & Son Waltham Cross	4,334	0	0
Eldridge & Son, Twickenham ...	4,333	0	0
C. H. Keen, Cranford	4.246	17	6
T. Hiscock, Hounslow	4,238	10	0
W. J. Snuggs, Aldershot	4,149	9	6
Woollaston Bros., South Hackney	4,111	0	0
J. McKay, Clacton	4,098	0	0
Wisdom Bros., Isleworth	4,095	0	0
E. J. Clayton, Uxbridge Road, W.	4,085	7	0
W. H. Hyde, Norwood Junction	4,081	0	0
Thomas & Edge, Woolwich ...	4,080	0	0
T. J. Hawkins & Co , Ashford ...	4,048	0	0
Dowley & Co., Woking...	4,000	0	0
R. Elvey & Son, Southend	3,990	0	0
Gathercole Bros., Norbury	3,990	0	0
G. H. Gibson, High Wycombe ...	3,947	0	0
A. & B. Hanson, Southall	3,916	0	0
Fitch & Cox, Enfield	3,898	0	0
J. & M. Patrick, Wandsworth ...	3,859	0	0
Myall & Upson, Ilford	3,750	0	0
T. J. Messom & Sons, Twickenham	3,591	0	0

Leatherhead.—For the widening, re-forming, kerbing, and providing and laying of 1,423 yards of 12-in. and 9-in. stoneware and storm-water drain in connection with the improvement of a portion of Kingston main road, for the Leatherhead U.D.C. Mr. J. E. Smales, engineer and surveyor:—

S. Faulkner, Reigate	£2,640	0	0
T. Watson, Southall	2,546	0	0
S. Atkins, Kingston-on-Thames ...	2,492	2	9
Zadig & Co., London...	2,296	0	0
E. H. King, Worthing	2,264	1	9
W. Norris, Farnham	2,214	0	0
Langley & Co., Slough	2,127	7	9
Free & Son, Maidenhead	2,079	14	10
G. G. Raquer, Croydon	2,053	6	10
G. A. Franks, Guildford	1,928	17	7
S. Kavanagh, Surbiton Hill ...	1,907	15	7
E. & E. Iles, Mitcham	1,886	0	0
Thacker & Co., Westminster ...	1,703	12	0
Streeter, Godalming	1,655	17	2
E. Patterton, East Molesey ...	1,563	4	2
J. May, Ashstead*	1,542	0	0
James & Co., Guildford (withdrawn)	1,388	0	0

Engineer's estimate, £1,725.

*Accepted.

Manchester.—For heating, hot-water supplies, &c. at the New Royal Infirmary. Messrs. Edwin T. Hall, V.-P.R.I.B.A., 54, Bedford Square, W.C. and John Brooke, A.R.I.B A., 18, Exchange Street, Manchester, joint architects:—

Keith & Blackman	£25 700
Z. D. Berry & Son	24,280
Newton, Chambers & Co.	23,702
Strode & Co.	18,593
Haden & Son	17,395
Saunders & Taylor	15,970
Dargue, Griffiths & Co.*	15,536

*Accepted.

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See Report in "Lancet," May 19th, 1906—

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Current Market Prices.

FORAGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	14	0	1	16	0
Clover, best...	per load	4	4	0	4	15	0
Hay, good	do.	3	17	6	4	2	6
Sainfoin mixture	do.	4	0	0	4	7	6
Straw...	do.	1	8	0	1	14	0

MISCELLANEOUS.

		£	s.	d.	£	s.	d.
Bricks Stocks, d/d to job	per 1,000	1	15	0	—		
Do. Flettons on rail ...	do.	1	5	0	—		
Do. Pressed Wire Cuts, d/d to job ...	do.	1	17	0	—		
Do. Blue brindled wire cuts	do.	1	2	0	—		
Do. do. wire cuts ...	do.	1	6	0	—		
Do. do. pressed facings	do.	1	17	6	—		
Cement	per ton	1	12	0	—		
Lime	do.	1	4	0			
Castor Oil, French ...	per cwt.	1	10	0	1	2	0
Colza Oil, English ...	do.	1	9	9	—		
Copperas	per ton	2	0	0	—		
Lard Oil	per cwt.	2	15	0	2	17	0
Lead, white, ground, carbonate	per ton	16	0	0	—		
Do. red	do.	15	0	0	19	0	0
Linseed Oil, barrels ...	per cwt.	0	19	0	—		
Petroleum, American ...	per gal.	0	0	6⅜	0	0	6½
Do. Russian ...	do.	0	0	6	0	0	6⅛
Pitch	per barrel	0	9	0	—		
Shellac, orange	per cwt.	10	19	0	—		
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Town	per cwt.	1	12	0	—		
Tar, Stockholm	per barrel	1	5	0	—		
Turpentine	per cwt.	2	5	10½	—		

METALS.

		£	s.	d.	£	s.	d.
Standard Copper	per ton	93	10	0	94	0	0
Do. Strong sheets ...	do.	96	0	0	98	0	0
Lead, soft foreign... ...	do.	19	0	0	19	5	0
Do. English	do.	19	5	0	19	10	0
Do. pipes...	do.	22	0	0	22	10	0
Do. sheets	do.	21	5	0	21	10	0
Galvanised Corrugated sheets	do.	12	12	6	12	15	0
Spelter G.M.	do.	27	10	0	27	15	0
Angles, Scotland	do.	6	15	0	6	17	6
Bars, do.	do.	7	15	0	8	0	0
Marked bars, Staffs. ...	do.	8	10	0	8	12	6
Common bars, do. ...	do.	6	7	6	6	10	0
Angles, M'boro.	do.	6	7	6	6	10	0
Joists. M'boro	do.	6	5	0	6	7	6
Angles, Midlands	do.	6	12	6	6	15	0
Joists do.	do.	6	15	0	6	17	6
Girder plates, Midlands ...	per ton	7	5	0	7	7	6
Angles, Foreign, c.i.f. Thames	do.	6	7	6	6	10	0
Tees do. do. do.	do.	6	10	0	6	12	6
Joists, do. do. do.	do.	6	3	6	6	5	0
Channels do. do. do.	do.	6	7	6	6	10	0
Plates do. do. do.	do.	6	15	0	7	0	0
Tin, Foreign	do.	194	0	0	195	0	0
Do. English ingots ...	do.	195	0	0	196	0	0
Zinc, sheets, Silesian, f.o.b.	do.	32	0	0	32	5	0
Do. do. V.M. do.	do.	32	5	0	32	10	0

TIMBER.

Soft Woods.

		£	s.	d.	£	s.	d.
Fir, Dantzic and Memel	per load	2	17	6	5	5	0
Pine, Quebec, Yellow ...	do.	3	12	6	6	0	0
Do. Pitch, American ...	do.	3	9	0	5	0	0
Laths, log, Dantzic	per cu. fath.	4	0	0	6	0	0
Deals, Archangel, White 2nd, 3×11	per std.	11	10	0	—		
Do. do. do. do. 3×9	do.	10	5	0	—		
Do. do. Yellow, 3rd 3×9	do.	10	15	0	—		
Do. do. do. do. 3×8	do.	10	0	0	—		
Do. Mesane, Yellow, 3rd. 3×9	do.	10	15	0	—		
Do. do. do. 4th, 3×9	do.	9	0	0	—		
Do. Montreal Spruce, 2nd, 3×9	do.	10	0	0	—		
Do. Nederkalix, Yellow, 3rd, 3×11	do.	7	15	0	—		
Do. do. do. do. 2½×7	do.	9	0	0	—		
Do. do. do. do. 3×9	do.	8	5	0	—		
Do. Batskarsnas, Yellow, 2nd, 3×9	do.	8	15	0	—		
Do. Räfsö, Yellow, 4th, 3×9	do.	8	0	0	—		
Do. do. do. do. 3×7	do.	8	10	0	—		
Do. do. do. do. 2½×7	do.	9	10	0	—		
Do. Riga, White, 2nd, 3×7	do.	8	5	0	—		
Do. do. do. unsorted, 3×9	do.	8	5	0	—		
Do. Ramvik, Yellow, 2nd, 2½×7	do.	9	5	0	—		
Do. Quebec, Spruce 2nd, 3×9	do.	9	15	0	—		
Do. do. do. 3rd, 3×9	do.	9	0	0	—		
Do. St. Petersburg, Yellow (dry), 1st, 3×11	do.	10	15	0	—		
Do. do. White, 3rd, 2½×7	do.	9	0	0	—		
Do. Skelleftea, Yellow 1st, 3×3	do.	9	5	0	—		
Do. do. do. 2nd, 3×3	do.	8	10	0	—		
Do. do. do. 4th, 3×9	do.	10	10	0	—		
Do. do. do. 5th, 3×9	do.	9	5	0	—		

		£	*s.*	*d.*	*£*	*s*	*d.*
Deals, Whitewood (Austrian), 1st&2nd, 3×11	per std.	9	0	0	—		
Do. Wartsala, Yellow, 1st & 2nd, 2½×7	do.	9	15	0	—		
Battens, Mesane, Yellow, 3rd, 2×9	do.	11	5	0	—		
Do. Brahestad, Yellow, unsorted, 2×5	do.	9	0	0	—		
Do. Nederkalix, Yellow, 2nd, 2×9	do	10	0	0	—		
Do. do. do. do. 2×8	do.	9	15	0	—		
Do. do. do. do. 2×7	do.	9	10	0	—		
Do. Räfsö, Yellow, 4th, 2×7	do.	8	15	0	9	0	0
Do. do. do. do. 2×6	do.	8	15	0	—		
Do. do. do. do. 2×5	do.	9	0	0	—		
Do. do. do. do. 2×4	do.	9	5	0	9	10	0
Do. do. do. unsorted, 2×4½	do.	9	0	0	—		
Do. Riga, Yellow, unsorted, 2×7	do.	9	0	0	—		
Do. Hudikstvall, Yellow, 5th, 2×9	do.	10	5	0	—		
Do. Holmsund, Yellow, 2½×6	do.	6	15	0	—		
Do. do. do. 2½×5	do.	6	0	0	—		
Ditto, Skelleftea, Yellow, 1st, 2½×4	do.	10	0	0	—		
Do. do. do. 2nd, 2½×4	do.	9	5	0	—		
Do. Sundswall, Yellow, unsorted, 2×5	do.	9	0	0	—		
Do. Wartsala, Yellow, 1st & 2nd, 2×7	do.	9	5	0	—		
Do. do. do. do. 2×4	do.	9	10	0	—		
Do. do. White, 1st & 2nd, 2×4	do.	9	0	0	—		
Flooring Boards, Fredriksstad, Yellow, unsorted, 1×4½	do.	0	8	3	—		
Do. do. do. do. do. 1×6	do.	0	10	0	—		
Do. do. Gothenburg, Yellow, dry, 3rd, 1×7	do.	0	10	3	—		
Do. do. Mon, Yellow, 2nd, 1×6	do.	0	11	0	—		
Do. do. Skonvik, Yellow, 1st, 1×7	do.	0	11	6	—		
Do. do. do. do. do. 1×6	do.	0	11	3	—		
Do. do. do. do. 2nd, 1×7	do.	0	10	9	—		
Do. do. do. do. do. 1×6	do.	0	10	6	—		
Do. do. do. do. 3rd. 1×6	do.	0	8	3	—		
Do. do. Sundswell, White unsorted, 1×6	do.	0	10	3	—		

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Complete List of Contracts Open.

WITH a few exceptions, news of Contracts Open are not repeated after they have been published once in these columns, so that readers will find particulars in our previous issues of other contracts that still remain open.

Unless expressly stated to the contrary, all deposits required for bills of quantities, &c., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair-wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

Oct. 11. Plympton.—*Erection of a new bathroom and lavatory* in the master's quarters at the Union Workhouse, Plympton. Plans and specifications may be seen, and further particulars obtained at the office of F. A. Clark, 83, Old Town Street, Plymouth. Sealed tenders, endorsed "Alterations," must be sent to W. Bickle, solicitor, Temple Chambers, Westwell Street, Plymouth, clerk, not later than Oct. 11.

Oct. 11. Belfast.—*Erection of additional warehouse* at Adelaide Street for Messrs. M'Bride and Williams. Plans and specifications can be seen of Young & Mackenzie, Scottish Provident Buildings, Belfast, and schedule of quantities obtained from W. H. Stephens and Son, on payment of a deposit of £2 2s. Sealed and endorsed tenders to be lodged with Young & Mackenzie, Scottish Provident Buildings, Belfast, on or before Oct. 11.

Oct. 12. Scarborough.—*Pulling down and rebuilding the premises, No 20, Newborough Street*, for M. J. Thompson. May see the plans and obtain other particulars of J. C. Petch, architect, Bar Chambers, Scarborough. Tenders to be sent to him at or before 10 o'clock a.m., on Oct. 12.

Oct. 12. Llanidloes.—*Erection of a new public building* at Llanidloes, Montgomeryshire, for Mr. David Davies, M.P., of Plas Dinam, Llandinam, Montgomeryshire. Bills of quantities and other particulars may be obtained of Shayler and Ridge, architects, Bank Chambers, Oswestry, and tenders, endorsed "Tenders for Public Building at Llanidloes," must be received by the architects before noon on Oct. 12. Tenderers will be required to deposit with the architect.

Oct. 13. Scredington.—*Erection of new rooms* and extensive repairs to a cottage in Mareham Lane. Tenders to be sent to B. Smith & Co., Horbling, Folkingham, not later than Oct. 13. Specifications and plan can be seen at their offices.

Oct. 13. Bridgend.—*Erecting a Mortuary, &c.*, at the Bridgend and Cowbridge Workhouse. Plans, &c., may be seen, and all particulars obtained, at the office of P. J. Thomas, architect, Bridgend. Tenders endorsed "Mortuary," to be received by R. Harmar Cox, clerk, Union Offices, Bridgend, before Oct. 13.

Oct. 13. Aberystwyth.—*Erection of proposed new villa* in Benadl Road, Buarth, Aberystwyth, for W. James, Esq., Blaengarw, South Wales. Plans and specifications may be seen of J. Lewis-Evans, architect and surveyor, 21, Great Darkgate Street, where sealed tenders are to be sent not later than noon Oct. 13.

Oct. 13. Torpoint.—*Structural alterations to the retort house* for the Directors of the Torpoint Coal and Gas Co. Plans and specifications may be seen (by appointment) on application to E. F. Clear, secretary, Torpoint, to whom sealed tenders, endorsed "Alterations to Retort House," should be sent on or before October 13 at noon.

Oct. 13. Nantymoel.—*Erection of a new police station* at Nantymoel, for the Standing Joint Committee of the Glamorgan Quarter Sessions and C.C. Fair wages clause. Plans and specification of the works may be seen and copies of the bill of quantities obtained at the Police Station, Tynewydd, and of T. M. Franklen, clerk of the County Council, Glamorgan County Council Offices, Westgate Street, Cardiff. Sealed tenders are to be delivered to the clerk, together with the full names and addresses of two substantial sureties, not later than Oct. 13, marked outside, "Tender for Nantymoel Police Station."

Oct. 13. London, W.—*Pulling down of the existing brick-arched carriageway bridge* over the canal, and the construction and erection of a new brick, concrete, and steel carriageway bridge (30ft. span), a new tollkeeper's office, and the execution of certain works appurtenant thereto, all in and about Warwick Avenue. Contract No. 1.—Building constructional works, &c. Contract No. 2.—Steelwork, &c. Contract No. 3.—Nos. 1 and 2 together. Forms of tender, general conditions, specifications, and bills of quantities will be furnished upon application to E. B. B. Newton, Assoc.M.Inst.C.E., F.S.I., borough surveyor, Paddington, W., after payment to the Borough Accountant of £1 for a set containing one copy for each document. Further particulars may be obtained, and the drawings seen, on application at the Borough Surveyor's Office between the hours of 10 a.m. and 4 p.m. (Saturdays, 10 a.m. and 1 p.m.), or on written inquiry to the Borough Surveyor and the receipt by him of stamped addressed envelope for reply. Tenders must be sent in sealed and endorsed "Reconstruction of Warwick Avenue Bridge," "No. 1, Building Constructional Works," "No. 2, Steelwork," or "No. 3, Nos. 1 and 2 together," directed to the Town Clerk, and delivered at his office, Town Hall, Paddington, W., not later than Oct. 13, after which no tender will be received.

Oct. 16. Durham.—*Alterations to Wolviston Council School*. Plans, specifications, and conditions of contract may be seen at the school and the architect's office. Quantities may be obtained on application to the architect. Sealed, endorsed tenders to be delivered to W. Rushworth, F.R.I.B.A., architect, County Education Offices, Shire Hall, Durham, not later than Oct. 16.

Oct. 16. London, E.C.—*Alterations and additions to the underground conveniences* in Bishopsgate Street Without and Aldgate, according to drawings and specifications to be seen at the office of the engineer to the Corporation, Guildhall, between the hours of 10 a.m. and 5 p.m., and bills of quantities and forms of tender may be obtained on payment of £1. Tenders on the before-mentioned forms must be addressed Town Clerk, Public Health Department, Guildhall, E.C., endorsed "Underground Conveniences," and delivered at the office of the hallkeeper, Guildhall, between the hours of 12.30 and 1.30 p.m., on or before Oct. 16, when the Streets Committee of the Corporation of London will meet at the Guildhall at 1.30 o'clock to receive tenders.

Oct. 16. Barry.—*Alterations and additions to the High Street Old Boys' and Infants' Schools, Barry*. Plans and specifications can be seen at the office of G. A. Birkenhead, architect, Caledonian Chambers, St. Mary Street, Cardiff, and 21, Park Avenue, Barry, from whom bills of quantities can be obtained on payment of £2 2s. The bill of quantities must be sent in under separate cover with the name of the person tendering on the outside. The tenders to be sent, sealed and endorsed, to T. B. Tordoff, clerk, Council Offices, Barry, before 5 o'clock on Oct. 16.

Oct. 17. Cleethorpes.—*Erection of an elementary school* in Elliston Street, Cleethorpes, for the Lindsey County Council Education Committee Bills of quantities and form of tender may be had on application to Scorer & Gamble, architects, Bank Street Chambers, Lincoln, on payment to them of £2 2s. The drawings and conditions of contract may be inspected at the offices of the architects. Tenders must be delivered to S. M. Grant, secretary, 286, High Street, Lincoln, in the envelope provided for that purpose, before 10 a.m. on Oct. 17.

Oct. 18. London, E.—*Erection of a disinfector shed* at the Workhouse, St. Leonard St., London, E., for the Stepney Union. Specification and forms of tender, &c., can be obtained on application to T. G. Stacey, clerk, Guardians offices, Barnes Street, Ratcliffe, E., and such tenders must be delivered to him on or before 4 o'clock on Oct. 18.

Oct. 18. Stafford.—*Erection of a weigh office* and for the building of the necessary foundations required for new weighbridge at the Union Workhouse for the Guardians of the Stafford Union. Plans and specifications may be seen on application to the Master of the Workhouse during the usual office hours. Sealed Tenders, endorsed "Weigh Office and Foundations," to be sent to W. Morgan, clerk, 4, Martin Street, Stafford, not later than Oct. 18.

Oct. 18. Salford.—*Removal of existing buildings and the erection of cottages* in Springfield Lane, Salford. Forms of tender, specification, and drawings may be obtained at the Borough Engineer's Office, Town Hall, Salford, upon payment of £2 2s. Tenders, endorsed "Springfield Lane Housing Scheme," addressed to the Chairman of the Health Committee, must be delivered to L. C. Evans, town clerk, Town Hall, Salford, not later than 11 a.m., Oct. 18.

Oct 19. Lerwick.—*Erection of a fish mart and offices* proposed to be erected on Alexandra Wharf, Lerwick. Plans and specifications may be seen with A. Sandison, clerk, at Lerwick, and with J. Barron, M.Inst.C.E., 216 Union Street, Aberdeen. Tenders to be lodged with the clerk on or before Oct. 19.

Oct. 20. Windermere.—*Addition of rooms and alterations of W.C.'s and Drains, &c* , at Ravrigg Hall, Windermere, for the Rev. Hugh Fleming. Plans and specifications of the work may be seen at the Hall on application to the housekeeper, and tenders must be sent in to John Banks, surveyor, Kendal, on or before Oct. 20.

Oct. 20. Stafford.—*New High School for girls*, Stafford, for the Staffordshire Education Committee. Builders desiring to tender for this work should apply to G. Balfour, Director of Education, County Education Offices, Stafford, on or before Oct. 20. Quantities will be supplied, for which a deposit of £2 2s. will be charged.

Oct. 20. Pontlottyn.—*Erection of a library and institute* at Pontlottyn, for the Trustees of the Pontlottyn Workmen's Library. Plans and specifications may be seen and bill of quantities obtained at the School House, Pontlottyn, on payment of £1 1s. Fair wages clause. Sealed tenders to be sent to the Secretary, W. Jones, School House, Pontlottyn, on or before Oct. 20.

Oct. 20. Langport.—*Alterations and improvements at the Council School, Langport*, for the County Education Committee. Drawings and specification can be seen at the office of Samson & Cottam, Bridgwater, from whom further information may be obtained. Tenders must be delivered at the County Education Office, Weston-super-Mare, not later than 12 noon, on Oct. 20.

Oct. 20. Haverfordwest.—*Reconstruction of the meat market*, including new steel roof with elliptical lattice-braced principals, &c. The drawings and specifications may be inspected at the Council Chamber, High Street, Haverfordwest, between 10 a.m. and 5 p.m. or at the office of J. Preece James, architect, Tenby. A deposit of £2 2s. will be required. Tenders, sealed and endorsed "Reconstruction of Market," on the forms supplied, are to be sent to R. T. P. Williams, town clerk, Haverfordwest, on or before Oct. 20.

Oct. 22. Hull.—*Construction of a timber wharf*, being an extension of the existing herring stage on the north side of the St. Andrew's Dock Extension, Hull. Plans may be seen and copies of specification obtained, on personal application to T. M. Newell, Dock Office, Hull. Sealed tenders, endorsed "Tender for Timber Wharf, St. Andrew's Dock Extension, Hull," to be delivered at the secretary's office, York, not later than 12 noon on Oct. 22.

Oct. 22. Cardiff.—*Alterations and additions to No. 4, St. John's Square*, Cardiff, to convert the same into club premises. The plans and specifications may be seen at the office of W. H. D. Caple, architect, 2, Church Street, Cardiff, from whom copies of the quantities may be obtained on deposit of £1 1s. Sealed and endorsed tenders to be delivered to the architect on or before Oct. 22.

Oct. 22. Mold.—*Erection and carrying out of the following works* for the Flintshire Educational Committee:—(*a*) The erection of a new school for 300 infants at Golftyn, Connah's Quay. (*b*) The erection of a new school for 300 infants at Custom House Lane, Connah's Quay. (*c*) Certain alterations and additions at the Abermorddu Council School, near Wrexham. Plans can be seen and specifications, bills of quantities, and form of tender can be obtained at the office of S. Evans, county surveyor, County Buildings, Mold, between the hours of 10 a.m. and 5 p.m. on payment of £2 2s. Tenders, duly made on the prescribed forms and enclosed in an envelope, which will be supplied, must be delivered at the County Education Offices, Mold, not later than the first post on Oct. 22.

Oct. 23. Bridport.—*Erection of a secondary school*, with accommodation for 150 pupils on a site in St. Andrew's Road, Bridport, for the Town Council. Drawings and specifications may be inspected at the offices of F. Cooper, architect, 77, East Street, Bridport. Sealed tenders, endorsed "Secondary School," and addressed to C. G. Nantes, town clerk, must be delivered before noon on Oct. 23.

Oct. 24. St. Helens.—*Additions to Cowley Middle Schools*, Cowley Hill Lane, St. Helens, for the County Borough Council. On deposit of the sum of £1 1s., plans and specifications may be inspected and bills of quantities and conditions of contract obtained at the offices of Frank S. Biram, architect, Hardshaw Street, St. Helens. Sealed tenders, endorsed "Tender for Additions to Cowley Schools," must be delivered to W. H. Andrew, town clerk, Town Hall, St. Helens, Lancashire, not later than 10 a.m. on Oct. 24.

Oct. 24. St. Helens.—*Erection of new schools* at Parr, St. Helens, for the Borough Council. On deposit of the sum of £1 1s., plans and specifications may be inspected and bills of quantities and conditions of contract obtained of F. S. Biram, architect, Hardshaw Street, St. Helens. Sealed tenders, endorsed "Tender for New Schools, Parr," must be delivered to W. H. Andrew, town clerk, Town Hall, St. Helens, Lancashire, on Oct. 24.

Oct. 25. London, S.W.—*Alteration and extension of the laundry* at the Workhouse, Swanfield Road, Wandsworth, for the Guardians of the Wandsworth Union. Persons desirous of tendering may inspect the drawings and specification, and obtain a copy of the bills of quantities and form of tender between the hours of 10 a.m. and 4 p.m. (Saturdays until 1 p.m.) upon application at the Guardians' Offices, St. John's Hill, Wandsworth, near Clapham Junction Railway Station, and by depositing with F. W. Piper, clerk, £2. Tenders, upon the form supplied must be signed, enclosed in the envelope provided, and delivered to F. W. Piper, clerk, Union Offices, St. John's Hill, Wandsworth, S.W., not later than 10 o'clock a.m. on Oct. 25.

Oct. 27. Chester-le-Street.—*Erection of a public sanitary convenience* at Usworth Village, for the R.D.C. Intending contractors to meet near The Church, Usworth Village, at 2 p.m. on Oct. 16, when J. H. Mole, surveyor to the Council, will point out the site and furnish all necessary particulars on payment of a deposit of £1. Written offers endorsed "Usworth Sanitary Convenience," to reach R. V. Dickinson, clerk to the Council, Union Offices, Chester-le-Street, not later than Oct. 27.

Oct. 30. Manchester.—*Erection of the Oswald Road Municipal School*, Chorlton-cum-Hardy, Manchester. Plans may be seen, and a copy of the bills of quantities (including specification) obtained at the Education Offices, Deansgate, Manchester, on a deposit of £2 2s. Tenders, on the official forms, and enclosed in the envelopes provided, must be delivered not later than Oct. 30. Cheques to be made payable to the Accountant, Education Offices, Deansgate, Manchester.

No date. Aberystwyth.—*Improvements and additions* to 34, North Parade, Aberystwyth. Plans and specifications may be inspected at the office of G. Jones & Son, MM.S.A., architects and surveyors, Llanbadarn Road, Aberystwyth.

No date. Long Eaton.—Contract No. 1.—*Erection of bakery, loading shed, stables, boiler house, &c.*, in Fletcher Street, Long Eaton. Contract No. 2.—For the steel roofing and steel girders and stanchions for the above buildings. Contract No. 3.—For the plumbing and glazing for the above buildings. Persons desirous of tendering for the above works, or any of them, for the Long Eaton Working Men's Co-operative Society, Ltd., may make written application to Ridgway & Smith, architects, Long Eaton, near Nottingham, with a deposit of £2 2s. for Contract No. 1 and £1 1s. for either No. 2 or No. 3 contracts. Fair wages clause.

ENGINEERING.

Oct. 13. Theux (Belgium).—*Construction of a bridge* over the Hoegne, at Chaufherd, 12,400 francs. Specifications and particulars may be obtained on application to Secretariat Communale, Theux, Liege. Tenders must be delivered by Oct. 13.

Oct. 13. London, S.W.—*Supply, delivery, and fixing complete* at the depot, Queen's Road, Wimbledon, of a circular saw bench, band sawing machine, and a 12-h.p. electrical motor for driving same. Particulars may be obtained on application to the Borough Engineer and Surveyor, Town Hall, Wimbledon. Sealed tenders, endorsed "Wood-cutting Machinery," to be delivery at the Town Hall on or before noon on Oct. 13.

Oct. 13. Newport.—*Supply of the following apparatus* for the Electricity and Tramways Department:—1. Three feeder boosters, one balancer, one electrically driven feed pump, one electrically driven two throw pump. 2. Switchboards and instruments. Specifications and forms of tender may be obtained on application to H. Collings Bishop, borough electrical engineer and tramways manager, Electricity and Tramways Department, Town Hall, Newport, Mon. Plans relating to switchboards may be inspected at the Electricity Offices, Town Hall, and copies of these plans may be obtained for the sum of 2s. 6d. Spare copies of the specification may be had on payment of 2s. 6d. A deposit of £2 2s. is required when application for specification is made. Tenders to be delivered to the Town Clerk, sealed in the envelopes provided, not later than Oct. 13.

Oct. 15. Coventry.—*Manufacture, supply and erection* for the Gas Committee, at their Foleshill Works, of the hydraulic plant:—Two wagon tipping machines, one direct acting hydraulic lift, two 1-ton capstans and snatch heads, one set of high-pressure steam pumps, one accummulator, &c., connecting pipes, valves, &c. Drawings, specification, and form of tender may be obtained on payment of £1 1s. Sealed tenders, addressed to the Chairman of the Gas Comittee, Gasworks, Coventry, endorsed "Tender for Hydraulic Plant," must be delivered not later than 9 a.m., Oct. 15.

Oct. 15. Coventry.—*Manufacture, supply, and erection, at the Foleshill Works* of the Gas Committee, of the following coal-conveying plant: Two gravity bucket conveyors, each about 830ft. long and capacity of 40 tons per hour; two short tray conveyors, each about 36ft. long and similar capacity; one large 4-roll coal breaker of capacity of 60 tons large coal per hour: high-pressure steam engines, for driving the breaker and conveyors; one 15-ton capacity receiving hopper, together with steel work, &c., for carrying breaker, &c. Drawings, specification and form of tender may be obtained of F. W. Stevenson, general manager, Gas Works, Coventry, on payment of £1 1s. Sealed tenders addreised to the Chairman, Gas Works, Coventry, endorsed "Tender for Coal Conveyors," &c., must be delivered not later than 9 a.m on Oct. 1.

Oct. 20. Wellingborough.—*Pumping machinery, gas engine, and suction gas plant* required for the Wellingborough U.D.C. pumping station at the Bushfields Waterworks. Plans and specifications may be obtained at the office of E. Y. Harrison, M.I.C.E., surveyor and water engineer, Park Road, Wellingborough, on payment of a deposit of £2 2s. Sealed tenders, on the prescribed form, endorsed "Tender for Pumping Machinery," to be delivered to Mr. Harrison by noon on Oct, 20.

Oct. 31. Zagazig.—*Installation of a supply of drinking water in the town of Zagazig*, in accordance with plans and specifications to be seen at the Ministry of the Interior. Tenders made out on stamped paper, obtainable from Lieut.-Col. Western, R.E., C.M.G., Queen Anne's Chambers, Westminster, S.W., and marked "Offre pour les travaux d'installation d'eau à Zagazig," should be addressed to "S. E. le Sous-Sécrétaire d'Etat, Ministère de l'Intérieure, Cairo," where they will be received up to Oct. 31. A deposit of 10 per cent. of the estimate is required to qualify any tender. Conditions of tender, together with lists of the materials and machinery required may be seen at the Commercial Intelligence Branch of the Board of Trade, 73, Basinghall Street, E.C.

Oct. 15. Erith.—*Deepening and repair of existing brick steined well* in the Electricity Works Yard, High Street, Erith, for the U.D.C. Copies of the specification with form of tender can be obtained from C. H. Fry, clerk of the Council, Council Offices, Bexley Road, Erith, Kent, on depositing the sum of £2 2s. Specification and plans can be seen, but not obtained, at the Offices of Hawtayne and Zeden, Consulting Engineers, 9, Queen Street Place, London, E.C. Tenders, sealed and marked "Tender for Well," to be addressed to C. H. Fry, and delivered not later than 5 p.m. on Oct. 15.

PAINTING AND PLUMBING.

Oct. 15. Plymouth.—*Painting a ward pavilion* at the Borough Hospital, Mount Gold. Specification may be seen for this work and forms of tender obtained at the offices of J. Paton, borough engineer and surveyor, Municipal Offices, Plymouth. Sealed tenders must be delivered at the said offices not later than 5 p.m. on Oct. 15.

Oct. 17. London, N.E.—*Painting the exterior of the casual wards, boiler house and other buildings* at Gainsborough Road, Hackney Wick, N.E., for the guardians of the Hackney Union. Specification, conditions of contract, and form of tender can be obtained of F. R. Coles, clerk to the guardians, Clerk's Office, Sidney Road, Homerton, N.E., between 10 a.m. and 4 p.m. Sealed tenders, endorsed "Painting Exterior of Casual Wards," must be delivered to the Clerk not later than two p.m.on Oct. 17.

Oct. 17. Stoke-upon-Trent.—*Painting, repairs and other work* required at the Union Offices, Stoke-upon-Trent, in accordance with specification to be seen upon application to C. Daniel, Clerk to the Guardians, Union Offices, Stoke-upon-Trent. Sealed tenders marked "Painting" to be sent to the clerk not later than 10 o'clock in the forenoon of Oct. 17.

Oct. 17. Dartford, Kent.—*Dry docking, painting internally and externally*, and carrying out other works to the Pontoon at Long Reach Hospital, Dartford, Kent, for the Metropolitan Asylums Board, in accordance with specifications prepared by W. T. Hatch, M.Inst.C.E., M.I.Mech.E., Engineer-in-Chief. Specifications, conditions of contract, and form of tender may be inspected at the office of the Board, Embankment, E.C., and can be obtained upon payment of a deposit of £1. Tenders, addressed as noted on the form, must be delivered at the office of the Board not later than 10 a.m. on Oct. 17.

ROADS AND CARTAGE.

Oct. 11. Cowpen.—*Making-up Wimborne Road* (area about 1,000 sq. yds.) within the district, for the U.D.C. Plans, sections, and specifications may be seen, and forms of tender obtained at the offices of R. Grieves, Seaforth Street, Waterloo, Blyth. Sealed tenders, endorsed "Tender for Street Work," must be delivered not later than 4 p m. on Oct. 11.

Oct. 11. London, W.—*Supply of 300 tons of Guernsey granite spalls* (large), to be delivered carriage paid at the workhouse, Fulham Palace Road, Hammersmith, W. Tenders, upon printed forms to be obtained of E. J. Mott, Clerk to the Guardians, Guardians' Offices, 129, Fulham Palace Road, Hammersmith, W., must be sent in not later than 10 o'clock Oct. 11, sealed and endorsed "Tender for Granite."

Oct. 11. London, N.E.—*Kerbing, channelling, paving, making-up, &c.*, of (a) Fletching Road, Clapton, and (b) Thornby Road, Clapton, for the Metropolitan Borough of Hackney. The general conditions of contract, and the specifications and plans and sections may be inspected, and copies of the bills of quantities and forms of tender obtained, on application to N. Scorgie, M.Inst.C.E., borough engineer and surveyor, and on payment of the sum of £1 1s. Tenders, sealed and endorsed "New Street Works," must be delivered at the Town Hall, Hackney, N.E., not later than 5 p.m. on Oct. 11. Fair wages clause.

Oct. 13. Wakefield.—*Alterations and additions to the following schools:*—New School at Birstall; Denholme District Provided School; Earby Riley Street Provided School, Thornton-in-Craven; Snaith Wesleyan School. Plans may be seen, and quantities obtained, on application to J. Vickers-Edwards, county architect, County Hall, Wakefield. A deposit of £1 is required in each case, cheques to be sent to the West Riding Treasurer, County Hall, Wakefield. Sealed tenders, properly endorsed, to be sent to the county architect not later than 10.30 a.m. on Oct. 13.

Oct. 15. Southgate.—1. *For making-up, kerbing, channelling, and paving* of a length of Bowes Road, between Brownlow and Stanley Roads. 2 For the paving of the footpaths in Warwick Road, Bowes Park, for the U.D.C. Plans may be seen on application to C. G. Lawson, C.E., Council's surveyor, from whom copies of the specifications and forms of tender may be obtained on depositing £2 in cash. Separate sealed tenders, endorsed (1) "Making-up of Bowes Road," and (2) "Paving Warwick Road," must be addressed to and reach W. M. Ellenor, clerk of the Council, Council Offices, Palmer's Green, N., not later than 12 o'clock at noon on Oct. 15.

Oct. 15. Plymouth.—*Making-up and completing* under Section 150 of the Public Health Act, 1875, the following streets and lanes—Neath Road lane north, No. 2. South View Terrace lane, No. 3. Beaumont Road lane, south, No. 3. Tenders are invited for carrying out the works. Plans and specifications, and conditions upon which forms of tender will be granted, may be seen and bills of quantities obtained of J. Paton, borough engineer, Municipal Offices, Plymouth. Sealed tenders must be delivered at the said offices not later than 5 p.m. on Oct. 15.

Oct. 15. East Preston.—*Steam rolling upon the roads* throughout the district, for the East Preston R.D.C. Tenders, stating weight of roller and other particulars, with price per day inclusive, to be sent to A. Shelly, clerk to the Council, Town Offices, Littlehampton, not later than October 15. The rolling will have to be done at such times and in such manner as the Council or their surveyor may from time to time direct. The person whose tender is accepted will be required to enter into a contract to supply the roller upon receiving six days' notice, under a penalty.

Oct. 16. Caerphilly.—*Paving, kerbing, channelling, flagging, sewering, forming and metalling* the following private streets within the district for the U.D.C.—1. Station Road, Senghenydd. 2. Station Terrace, Senghenydd. 3. High Street, Abertridwr. 4. Central Terrace, Rees Terrace, Ffrwd Terrace, Glenview Terrace, and Wingfield Villas, Llanbradach. Plans and specifications may be seen and form of tender obtained at the Surveyor's Department, Council Offices. Caerphilly, upon depositing the sum of £1 1s. Sealed tenders, endorsed "Street Works," to be addressed to the Chairman of the Council, and delivered at the Council Offices, Caerphilly, not later than Oct. 16.

Oct. 17. London, W.—*Making-up and paving Dunraven Road* (part of) *and Osman Road* (part of) for the Borough Council of Hammersmith. Plans and specifications may be seen and forms of tender obtained on application to H. Mair borough surveyor. Sealed tenders, endorsed "Tenders for Paving Works," must be delivered to H. Thompson, town clerk, Town Hall, Broadway, Hammersmith, not later than 6 p.m. on Oct. 17.

Oct. 22. Batley.—*Levelling, paving, flagging, channelling and completing* of each of the following streets—The Crofts, Jowett's Yard, and William Street, in the Borough of Batley. Plans, sections, and specifications of the said works respectively may be seen on application to O. J. Kirby, borough engineer and surveyor, Town Hall, Batley. Sealed tenders, on forms which may be obtained from the borough surveyor, properly endorsed, to be delivered to J. H. Craik, town clerk, Town Clerk's Office, Town Hall, Batley, not later than Oct. 22.

Oct. 22. Bishop's Stortford.—*Supply of 1,600 tons, or thereabouts, of 1¾-in. broken granite*, and 160 tons, or thereabouts, of ½-in. granite chippings for the U.D.C., to be delivered at the Bishop's Stortford railway station in quantities of about 20 tons per day, or at the Council's wharf on the river Stort in full barge loads as may be agreed upon. Persons tendering to state in their tender the price at which they will be prepared to deliver Tar-Macadam or Tarmac in full truck loads at Bishop's Stortford railway station. Forms of tender can be obtained on application to T. Swatheridge, clerk, Council Offices, North Street, Bishop's Stortford. Tenders, accompanied by samples of the material proposed to be supplied, to be sent to him by 4 o'clock p.m. on Oct. 22.

SANITARY.

Oct. 15. Skegness.—*Laying 772 yards of 9-in. pipe sewer* alongside Golf Links on Drummond Road, at a depth varying between 10½ and 4½ feet deep, with appurtenant works for the U.D.C. Plans and specification can be seen at the Office of Elliott & Brown, engineers, Burton Buildings, Parliament Street, Nottingham, and copies of the bills of quantities and form of tender obtained on deposit of £2 2s. Sealed tenders, addressed to G. J. Dashper, solicitor and clerk to the Council, Council Offices, Skegness, and endorsed "Tenders for Sewerage Works," to be delivered on or before the first post on Oct. 15.

Oct. 19. Surbiton.—*Re-constructing the Combined Drains* belonging to Nos. 1 to 4, Elmden Terrace, Douglas Road; Nos. 17, 18 and 19, Cleaveland Road; and Nos. 9 and 10, St. Mary's Road, Surbiton for the U.D.C. Plans may be seen, and specification and form of tender may be obtained upon application to W. Nesfield, A.R. San I., Sanitary Inspector, at the Council Offices during office hours, on payment of a deposit of 10s. 6d. Sealed tenders, made out on the form and enclosed in the envelope supplied, must be delivered at the Council Offices at or before 10 a.m. on Oct. 19.

TIMBER.

Oct. 22. Ventnor.—*Construction of a timber groyne* 170ft. in length, on the eastern shore of Ventnor, for the U.D.C. Detailed specification and plans may be inspected at the office of the town surveyor, Town Hall, Ventnor. Tenders, marked "Groyne," must be received by R. M. Barr, Clerk of the Council, Town Hall, Ventnor, not later than Oct. 22.

MISCELLANEOUS.

Oct. 12. Leigh.—*Supply of about 400 tons of best hand-picked lime*, to be delivered at the Sewage Works, Mather Lane, Leigh, during the ensuing 12 months, for the Leigh and Atherton Joint Sewerage Board. Sealed tenders, marked "Lime Contract," to be delivered to D. Schofield, clerk, Town Hall, Atherton, not later than Oct. 12.

TOO LATE FOR CLASSIFICATION.

Oct. 15. Mold.—*Providing benches, shelves, cupboards for Chemical Laboratory*, gallery, tables, dresser for Cookery Class Room, shelving for Library, requisites for Laundry, for the County School. Specifications and models can be seen at the School by appointment. Tenders to be sent to W. R. Howard Evans, solicitor, Mold, clerk to the Local Governors, not later than Oct. 15.

Oct. 15. Edinburgh.—*Erection of a convenience and cloakroom* for women at Holyrood, conform to plans, specification and schedule of measurement prepared by the Burgh Engineer, from whom schedules of quantities and all particulars may be obtained. Sealed offers, marked outside "Tender for Convenience, Holyrood,' must be lodged with T. Hunter, W.S., town clerk, City Chambers Edinburgh, not later than Oct. 15.

Oct. 15. Monaghan. *Repairs of two labourer's cottages* in Mullan and one in Cornanure. Specification of the work to be done can be had on application to clerk. Tender must be lodged with S. Mitchell, clerk to the Council, Boardroom, Workhouse, Monaghan, or dropped into the tender box in Workhouse, before 12 o'clock noon on Oct. 15. Tenderers to name two solvent sureties willing to enter into a bond for the due perfection of said repairs.

October 18. Harrogate. *Private street works* required in back roads on south west side of West End Avenue for the Harrogate Corporation. The specification may be seen and quantities obtained of F. Bagshaw, borough engineer and surveyor. Tenders must be submitted not later than 9 o'clock a.m. on Oct. 18.

Oct. 19. Elgin. *Erection of a double cottage* in Grant Street. Plans and specifications may be seen with C. C. Doig, architect, 147, High Street, Elgin, and offers lodged with him on or before Oct. 19.

Oct. 20. Bournemouth.—*Erection of caddies' shelter and master's office*, for Queen's Park Golf Links, and other works in connection therewith. Full particulars, forms of tender and specification can be obtained of the Borough Engineer, F. W. Lacey, at whose office drawings can be seen, provided that the sum of £2 2s. has been previously deposited with F. W. Lacey, M.Inst.C.E., borough engineer and surveyor, Municipal Offices, Bournemouth. Tenders to be sent in in envelopes provided for the purpose, to G. W. Bailey, town clerk, before noon of Oct. 20.

Oct. 23. Bargoed.—*Erection of underground public convenience*, consisting of four urinal stalls, water-closet, lavatory fittings, &c., near the entrance to the Rhymney Railway Station at Bargoed, in the parish of Gelligaer. Plans and specification may be seen, and bills of quantities obtained, upon application to P. Jones, F.I.S.E., Council's engineer and surveyor, Council Offices, Hengoed, *via* Cardiff. Sealed tenders, endorsed "Public Convenience, Bargoed," to be delivered to F. T. James, clerk, 134, High Street, Merthyr Tydfil, on or before Oct. 23.

Oct. 23. Selby.—*Erection of cottage, office, and boundary wall*, at the New Waterworks, Brayton Barff, Selby, for the U.D.C. The drawings and specifications can be seen at the offices of Percy Griffith, M.Inst.C.E., engineer, 54, Parliament Street, Westminster, S.W., and Bruce McG. Gray, A.M.Inst.C.E., engineer, Council Offices, Selby, and forms of tender and bill of quantities may be obtained on payment of a deposit of £1 1s. Sealed tenders endorsed "Cottage, etc.," to be delivered to J. H. Bantoft, clerk to the Council, Council Offices, Selby, not later than 12 noon on Oct. 23.

Oct. 24. Bradford.—*Additions to the national schools*, Thornton, Bradford. Plans, &c., may be seen and quantities obtained of S. Spencer, architect, &c., Old Bank Chambers. Great Horton, Bradford. Tenders must be in by Oct. 24.

Electrical Notes.

Modern Electric-Light Fittings.

Owing to the growth of artistic taste few householders are content to have the lighting arrangements of their homes carried out in the perfunctory manner which formerly used to be considered good enough. Then the gas fitting reigned supreme, and where electricity had obtained a precarious footing it was supplied to lamps fixed in brackets or pendants modelled on the lines of the gas pipe, if not that abomination known as the converted gas bracket. The electric-light fitting of the early nineties was crude. Fittings were frequently long bare rods, or cords with ugly globes depending from them. Of late years, however, the improvement of taste has spread to the electrical metal workers, and following the example of the Edison and Swan United Electric Light Co., Ltd., of 36-37, Queen Street (who were, we believe, the first firm to turn their attention to artistic electrical fittings), many makers now strive to bring their designs more into line with modern requirements. The price lists and leaflets issued from time to time by the Ediswan firm have always been full of good designs, and in the new edition of their fittings catalogue, Section VI., the same qualities are evident; obsolete and inartistic designs being eliminated, and illustrations given of a large number of excellent pendants, standards and electroliers to suit every style of decoration. Worthy of particular attention are the new Flemish designs of electroliers, with brackets in keeping. These are in polished brass, with ornamental chain and back-plate, and are fitted with the "Huntalite" candle lamp. Very popular also should be the "Adam" type standards, finished in imitation gilt, although we note that any other finish can be obtained to order. The "Empire" and Louis XVI. type of French standards, in bronze and gilt, are also attractive, while in ceiling fittings we find every type fully illustrated, from the massive 6-light fitting with long trumpet shades to the dainty copper tulip fixture, eminently suitable for low rooms. Architects will find it useful to have this catalogue on their shelf.

ELECTRIC PENDANT BY EDISON AND SWAN CO.

Life of Lamps.

It is curious how few people trouble to understand the essentials that go to make a perfect electric lamp. They will minutely check their lighting bills, but few appreciate the relation between the lamps they use and the cost of lighting. Either they buy a certain lamp simply because it is cheap, largely advertised, or else they buy a good lamp and use it until the bulb is absolutely black. Now, although many lamps have a long life, it is not economical to burn even the best for more than about 8,000 hours. It is interesting to note that, according to reliable figures, lamps should be changed as follows :—

Lamps	installed in	January,	change in	June.
,,	,,	February	,,	August.
,,	,,	March	,,	September.
,,	,,	April	,,	October.
,,	,,	May	,,	November.
,,	,,	June	,,	November.
,,	,,	July	,,	December.
,,	,,	August	,,	December.
,,	,,	November	,,	February.
,,	,,	December	,,	April.

In this way the careful householder will find a substantial increase in the efficiency of his lighting, coupled with a reduction in his lighting account.

Dainty Electric Light Fittings

FOR . . .

Dainty Rooms

Require Distinctive Designs in

ELECTRIC LIGHT FITTINGS.

Make a note of the fact that the "Royal Ediswan" Electric Lamp is the BEST and CHEAPEST in the end.

Drawing Room
Dining Room
Library
Hall
Stairs
Bedroom
Night Nursery
Boudoir
Dressing Room
Smoke Room
Landing

The finest Showrooms in London filled with designs of Flemish, Dutch, French, Inlaid Louis XVI., Empire and Adams' Art Fittings are those of the

Edison & Swan United Electric Light Co.
LTD.

36-37, QUEEN STREET, LONDON, E.C.

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—adjudication.]

During the week ending October 5th twenty failures in the building and timber trades in England and Wales were gazetted.

R. Henderson, builder, Westcliff-on-Sea. R.O., Sept. 22.

W. Wade, builder, Crewe. P.E., Crewe C.C., Oct. 6, at 11.15.

J. C. Nichol, builder and contractor, South Shields. Adj., Sept. 26.

W. Thomas, carpenter, St. Tudy. P.E., Town Hall, Truro, Oct. 20, at 11.45.

G. Wilkes, builder, Quatford, near Bridgnorth. P.E., Madeley C.C., Oct. 10, at 11.15.

A. Ibbot, builder and contractor, Bedford. P.E., Shire Hall, Bedford, Oct. 30, at 11. Adj., Sept. 24.

D. J. Phillips, builder and contractor, Maesteg. Gross liabilities, £355; £305 expected to rank; assets, £13; deficency, £292.

E. Antill & Sons, builders, Lewisham and Bermondsey. P.E., London Bankruptcy Court, Nov. 14, at 11.30. R.O., Sept. 24.

O. C. Parfitt, plumber, Bristol. First meeting O.R.'s, Bristol, Oct. 10, at 11.30. P.E., Guildhall, Bristol, Oct. 26, at 12. Adj., Sept. 27.

T. Hughes, carpenter, Peterstow. First meeting, 2, Offa Street, Hereford, Oct. 11, at 10. P.E., Shire Hall, Hereford, Oct. 11, at 10.30.

E. Chesterman, carpenter, Bristol. First meeting, O.R.'s, Bristol, Oct. 10, at 11.45. P.E., Guildhall, Bristol, Oct. 26, at 12. Adj., Sept. 24.

G. S. Godfrey, plumber, Gillingham. First meeting, 115, High Street, Rochester, Oct. 22, at 11.30. P.E., Rochester C.C., Oct. 22, at 2.30. Adj., Sept. 25.

Wholesale Plumbers' Supply Co., plumbers' merchants, Rochdale. First meeting, Town Hall, Rochdale, Oct. 12, at 11.15. P E., Public Hall, Rochdale, Nov. 19, at 11.15.

Coming Events.

Saturday, October 13.

Junior Institution of Engineers.—Visit to Engineering and Machinery Exhibition at Olympia, at 3.30.

Institute of Sanitary Engineers.—Visit to Messrs. Waring & Gillow's new premises, Oxford Street.

North of England Institute of Mining and Mechanical Engineers.—Meeting at Newcastle, at 2 p.m.

Monday, October 15.

Institute of Sanitary Engineers.—Meeting at 8 p.m.

Royal Sanitary Institute.—Prof. H. R. Kenwood on "School Furniture," at 7 p.m.

Wednesday, October 17.

Architectural Association (Discussion Section).—Mr. M. G. Pechell on "Motor Garages," at 7.30 p.m.

Thursday, October 18.

Society of Architects.—Twenty-second Anniversary Meeting, at 8 p.m.

Friday, October 19.

Architectural Association.—Mr. Alan Potter on "The Architecture of the Roman Empire," at 7.30 p m.

Monday, October 22

Liverpool Architectural Society.—Mr Peter Cowell on "Old English Customs and Folk Lore." Visit to the Liverpool Free Library.

Royal Sanitary Institute.—Mr. W. C. Tyndale, M.I.C.E., on "Sanitary Appliances," at 7 p.m

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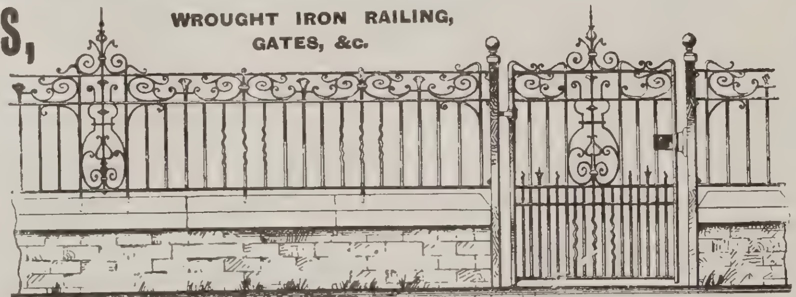

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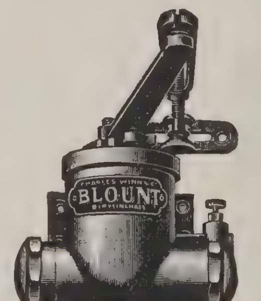

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THE BUILDERS' JOURNAL
AND ARCHITECTURAL ENGINEER.
October 10, 1906.

CONCRETE AND STEEL SUPPLEMENT (MONTHLY).

THE FINISHING OF CONCRETE FLOORS.

Now that concrete floors are so much in vogue, by reason of their fire-resistance and economy of construction for sustaining heavy loads, it becomes a matter of anxious consideration to the architect to know how to finish the surface of such floors. There are several systems open for adoption.

The surface can be finished smooth with the trowel in concrete itself, for instance. It is true this will form an impervious surface, but ordinary aggregates do not wear well under much traffic, and such a surface is somewhat slippery. Consequently where such a method is adopted it has been customary to finish the top with a richer mixture of concrete than the under portion of the floor, and to use aggregates that resist wear—such as granite chippings, broken spar, and marble chips. The last mentioned (marble) constitutes the well-known terrazzo flooring, which gives a much better appearance to the floor surface than either of the other aggregates. The small broken pieces of marble which are placed on the surface of the floor are of course rubbed down until there is very little of the cement matrix to be seen, and the floor is finally polished.

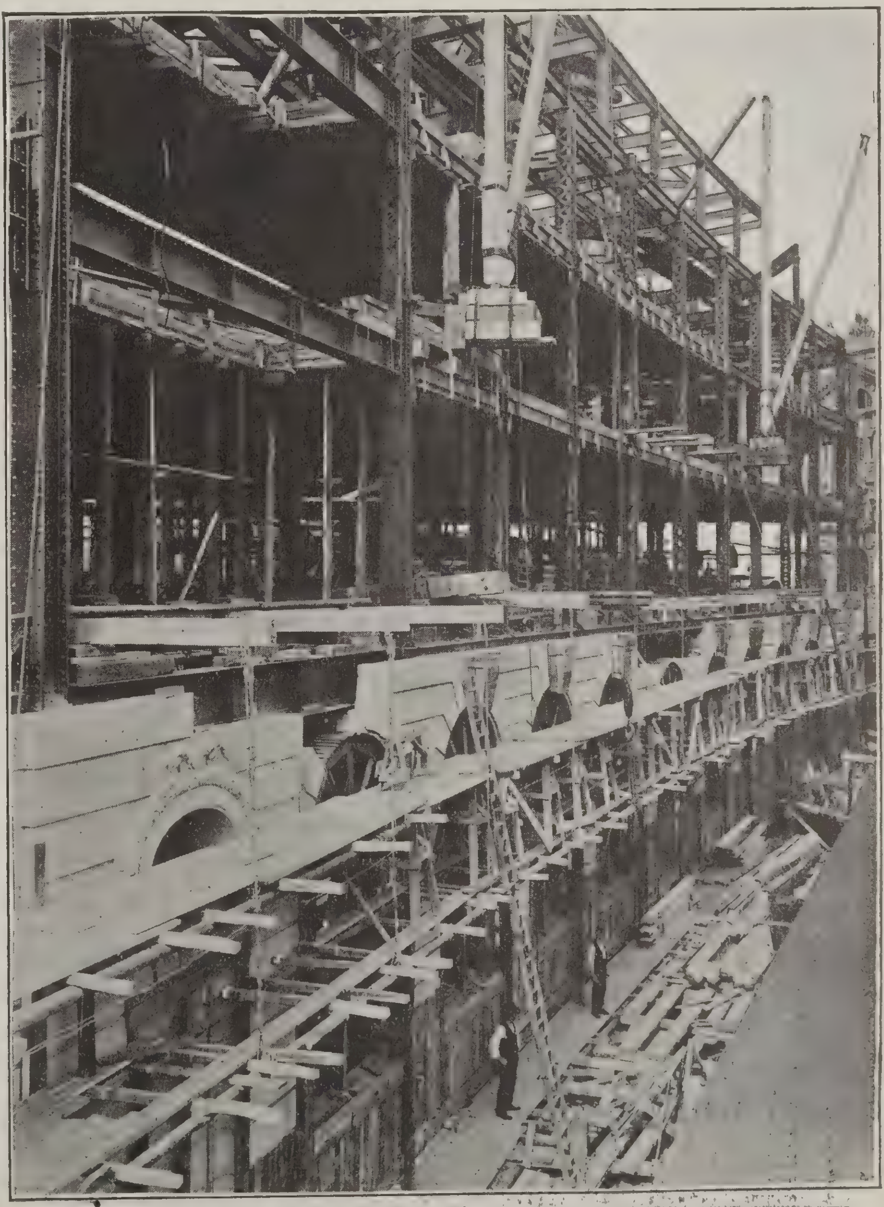
Such floors, however, are cold: hence another method has been largely adopted—namely, the use of a special magnesian or other strong cement (whose setting is not affected by the use of organic material and finely powdered matter which may be added to colour the coating) with aggregates such as sawdust, shavings, and straw. These cements and admixtures of cement and aggregates are known under various fancy names. They form impervious and clean surfaces which add to the value of the flooring where hygiene is of first importance, and also where the floor may be subjected to liquids, such as in bathrooms, lavatories, hospitals, warehouses, and offices. Although such floors are warmer than concrete or terrazzo floors, they take an intermediate position between these and the third method of finishing floors—namely, to use wood in some form.

Of the third method the most elementary form is to use plain boards nailed either direct to wooden or breeze-concrete fillets let into, or raised above, the main body of the concrete. The latter is, perhaps, preferable, as giving a certain amount of spring to the floor and being drier, but if the boards are laid direct upon the concrete, depth is economised and no room is given for vermin or dirt and microbes; the boards, however, require tarring on the underside or need to be laid upon a bitumen coating, in order to prevent the moisture getting through into the concrete, or moisture penetrating from the concrete into the boards and causing the troublesome expansion and contraction, which will be referred to more fully in the case of wood blocks. Parquetry is applied to boarded floors as a rule, but it might be placed upon floors treated as in the second method. It is decorative, but would obviously be adopted in but few situations.

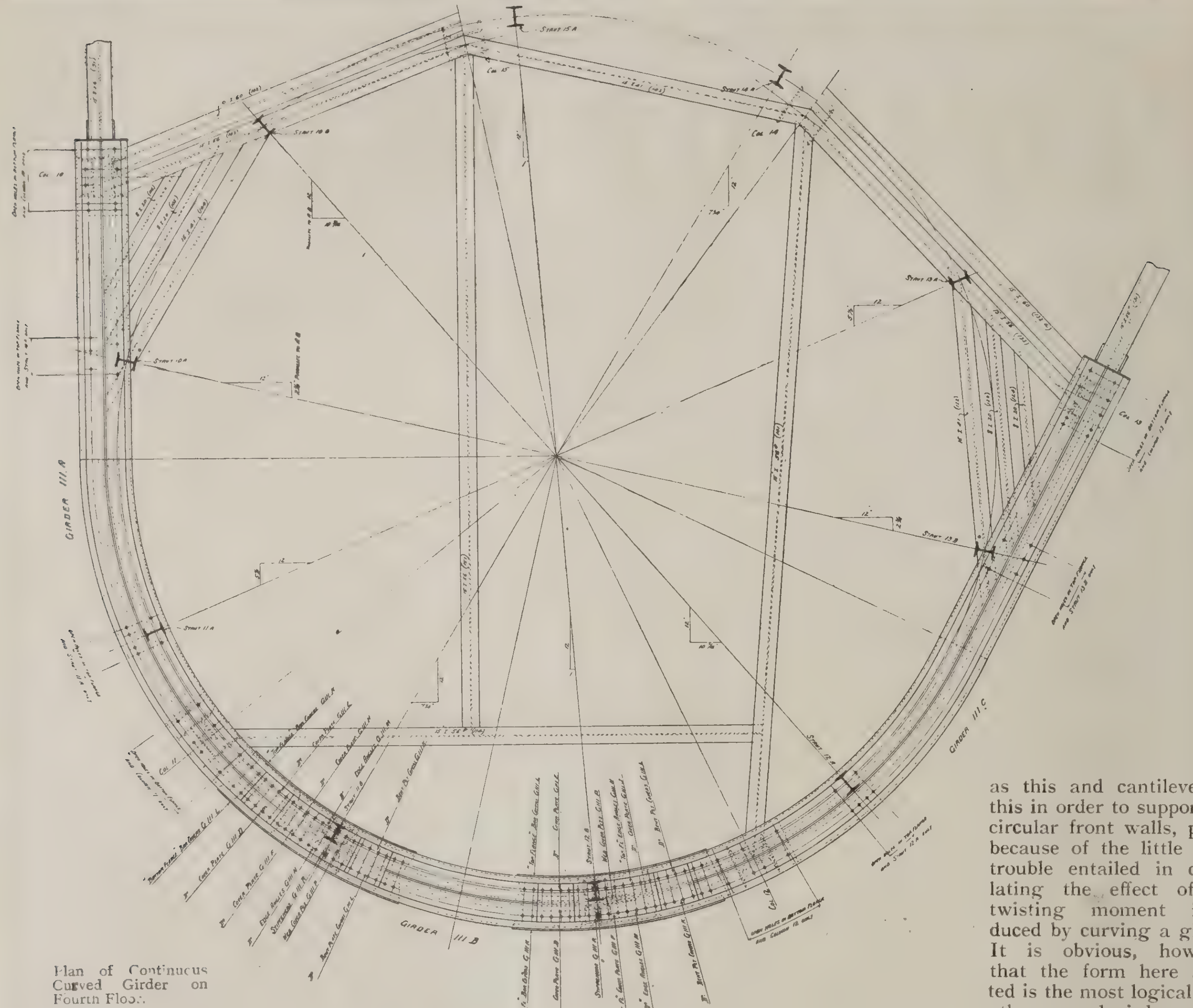
We now come to wood blocks as a subdivision of our third method. This is a flooring very largely adopted. Of course wood blocks have joints, but they are hygienic in so far that they can be kept clean easily. The trouble, however, with wood-block floors is that they are absorptive of moisture and, consequently, are subject to warping, expansion and contraction, resulting in bulging, opening at joints and uneven wear. Various devices have been adopted to meet this difficulty, among which may be mentioned the use of dowels, or wooden and metal pins or nails. The blocks are also laid on a tar or pitch coating. This prevents the ill-effects of moisture to some extent, but if the joints open so as to let water get in and thoroughly saturate the blocks they will expand, and, wedging themselves against the walls, will bulge up.

THE "MORNING POST" BUILDING.

In our "Concrete and Steel Supplements" for May 23rd and June 20th last we published photographs showing the construction of the new "Morning Post" building in Aldwych, London. We now give further views showing the steel frame practically completed, and the erection of the granite facing round the steel work, together with two detail drawings of a novel and interesting piece of girder construction at the fourth floor level. The plan shows the complete girder, which will be seen is curved, but the sectional plans and elevation relate only to the right-hand portion of the girder, which has been made in three parts. It is customary to place a straight girder across a curved corner such

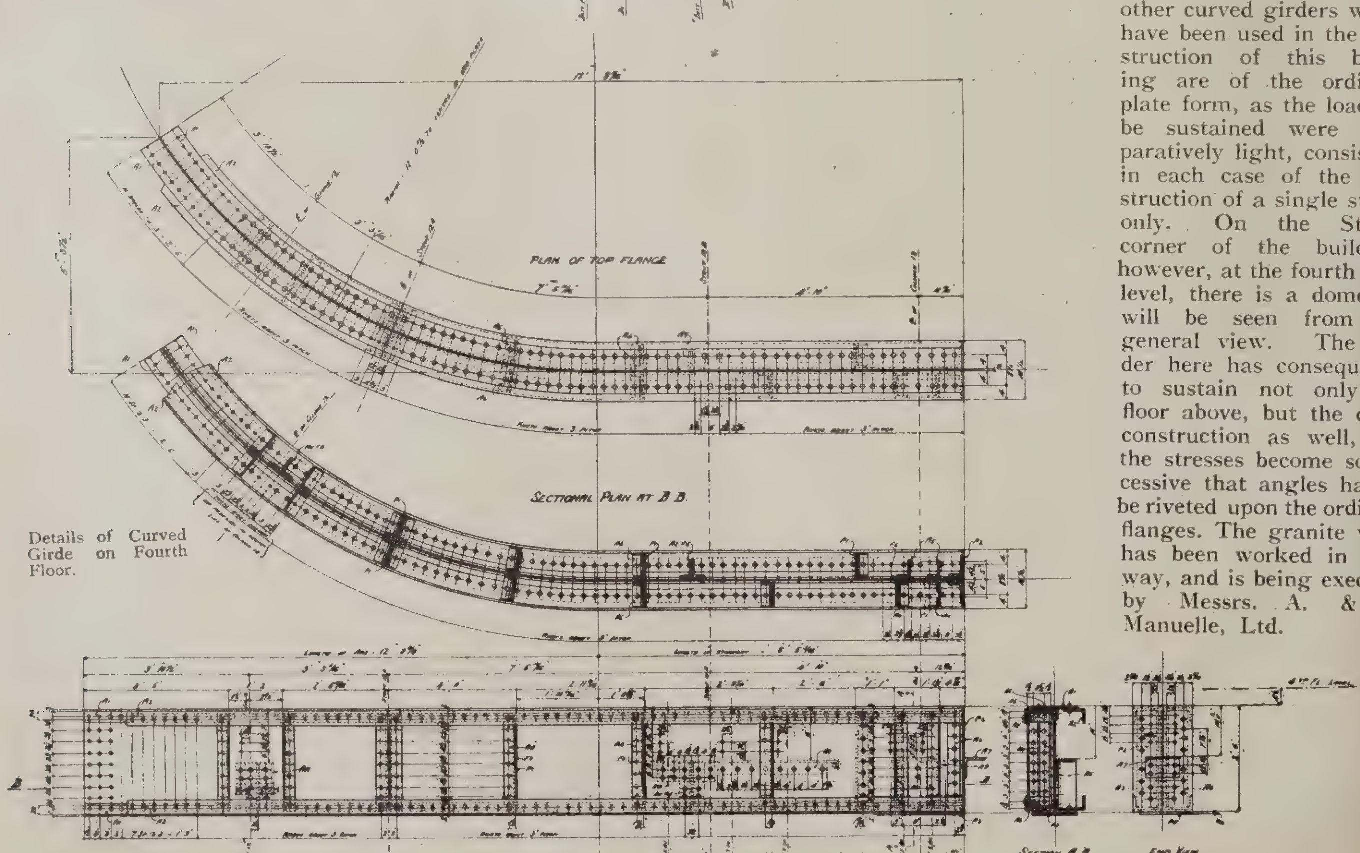


NEW "MORNING POST" BUILDING, LONDON: VIEW SHOWING GRANITE FACING TO STEEL FRAME ON ALDWYCH FRONT. MEWES AND DAVIS, ARCHITECTS.



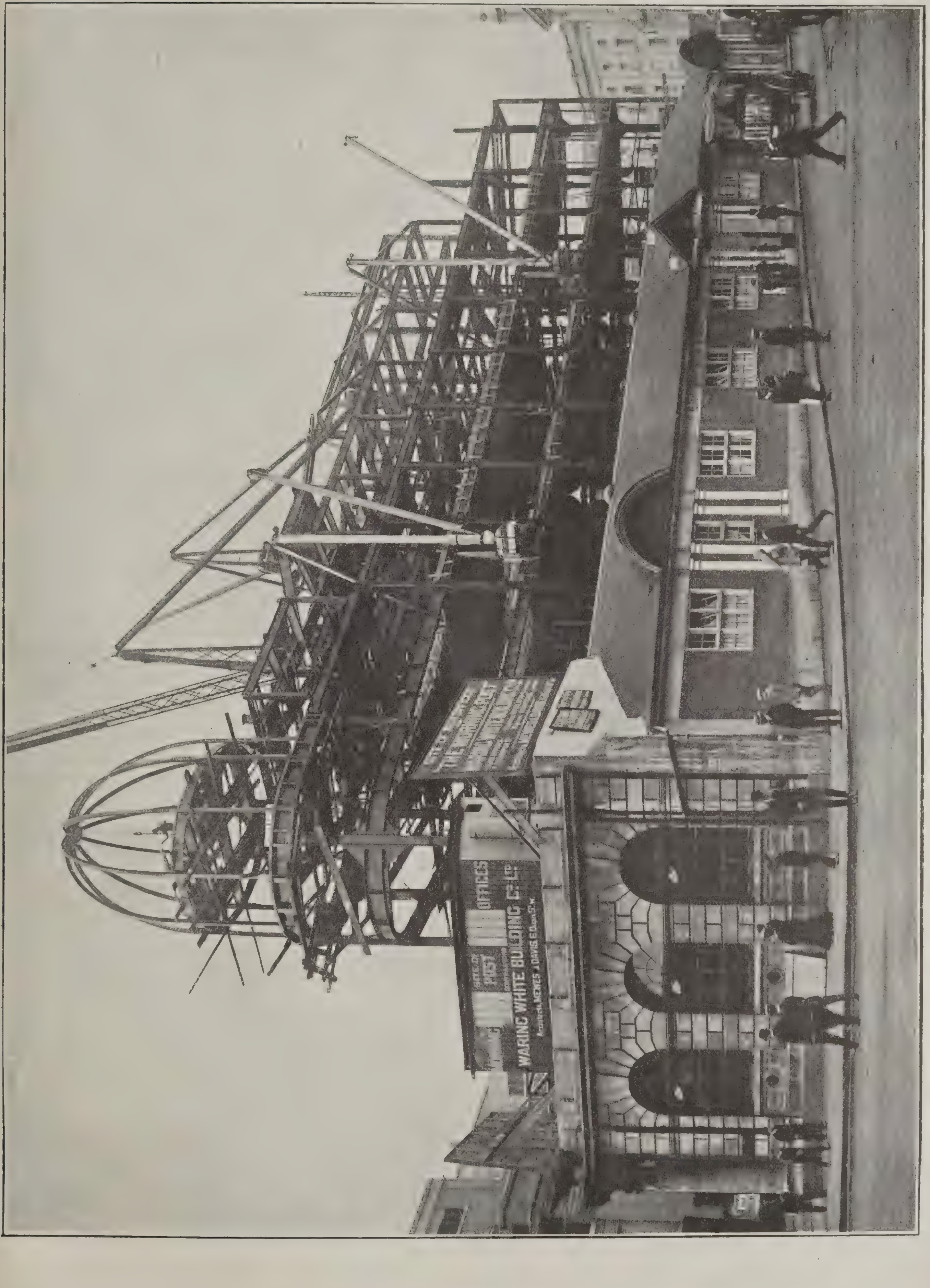
Plan of Continuous Curved Girder on Fourth Floor.

as this and cantilever on this in order to support the circular front walls, partly because of the little extra trouble entailed in calculating the effect of the twisting moment introduced by curving a girder. It is obvious, however, that the form here adopted is the most logical. The other curved girders which have been used in the construction of this building are of the ordinary plate form, as the loads to be sustained were comparatively light, consisting in each case of the construction of a single storey only. On the Strand corner of the building, however, at the fourth floor level, there is a dome, as will be seen from the general view. The girder here has consequently to sustain not only the floor above, but the dome construction as well, and the stresses become so excessive that angles had to be riveted upon the ordinary flanges. The granite work has been worked in Norway, and is being executed by Messrs. A. & F. Manuelle, Ltd.



Details of Curved Girde on Fourth Floor.

NEW "MORNING POST" BUILDING, LONDON. S. BYLANDER, ENGINEER FOR STEELWORK. MEWES AND DAVIS, ARCHITECTS.

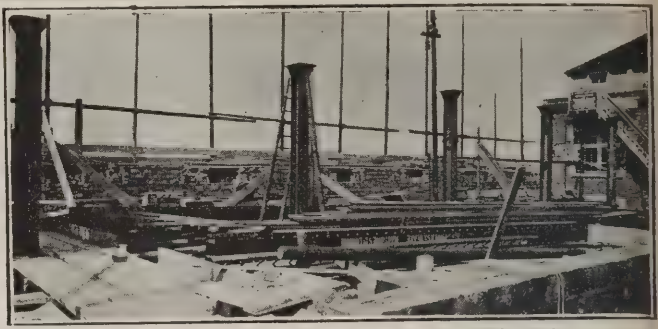


NEW "MORNING POST" BUILDING, LONDON: GENERAL VIEW OF STEEL FRAME. (Taken on September 7th, 1906.) MEWES AND DAVIS, ARCHITECTS.

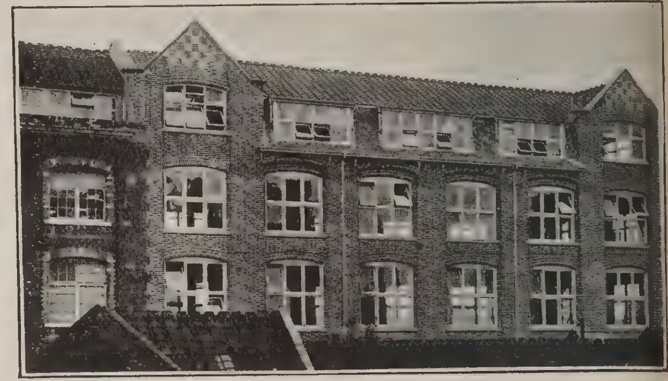
View of Site taken on May 3rd, 1906.

View on First-Floor Level taken on May 17th, 1906.

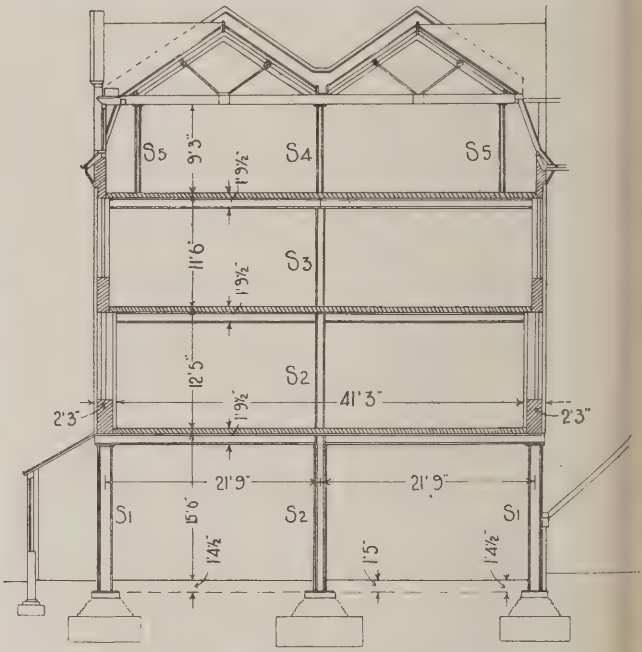
View on Third-Floor Level taken on June 14th, 1906.

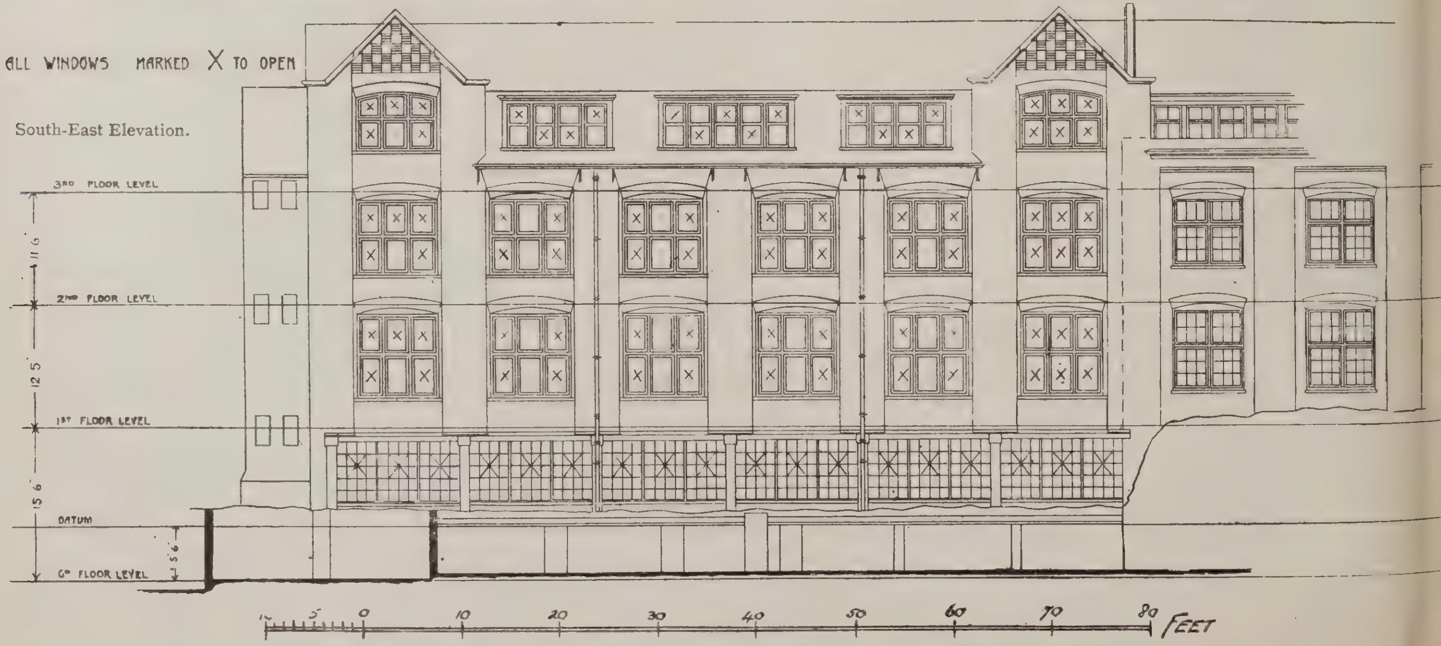


View on Second-Floor Level taken on May 28th, 1906.



View of Completed Building taken on August 9th, 1906.





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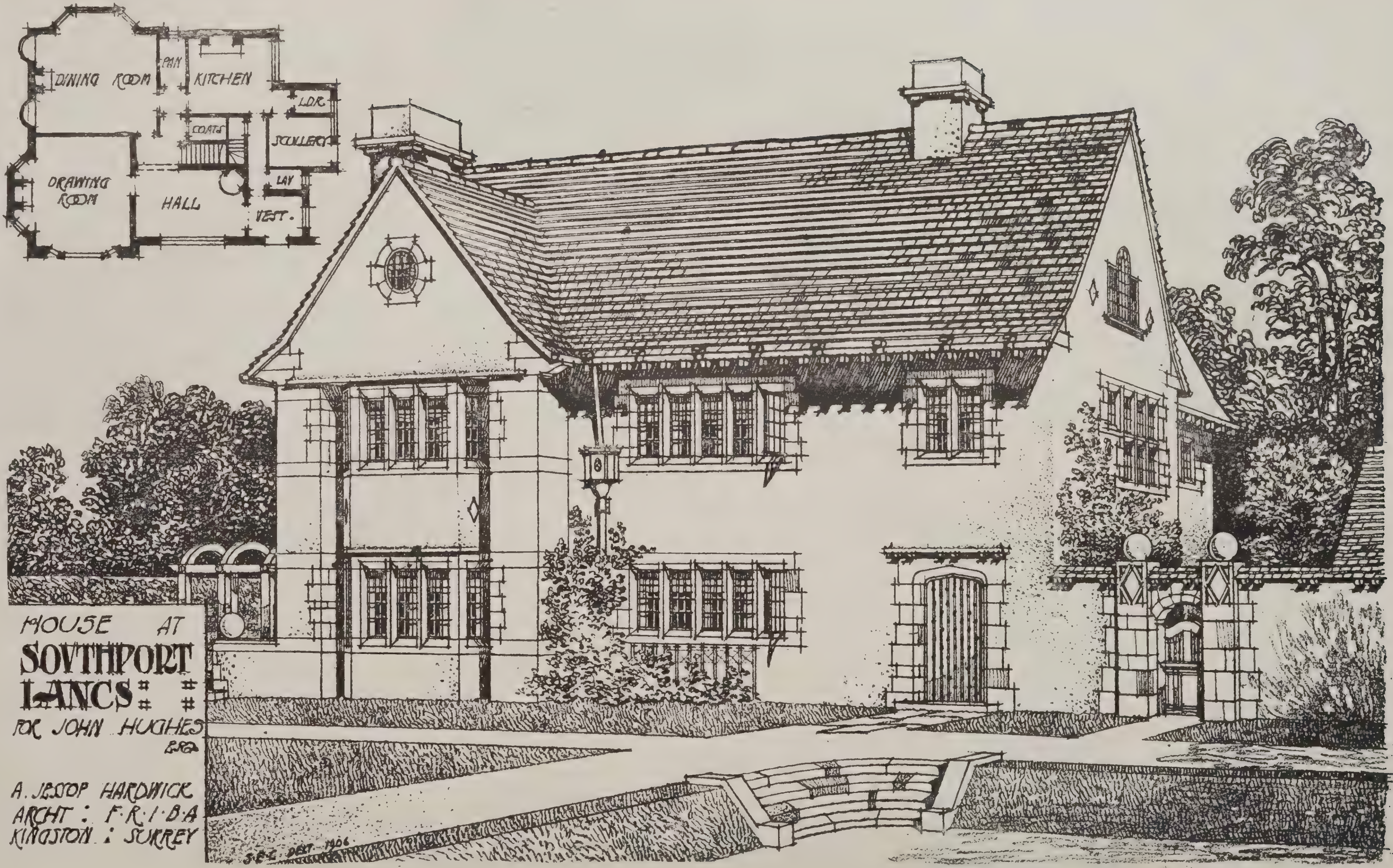
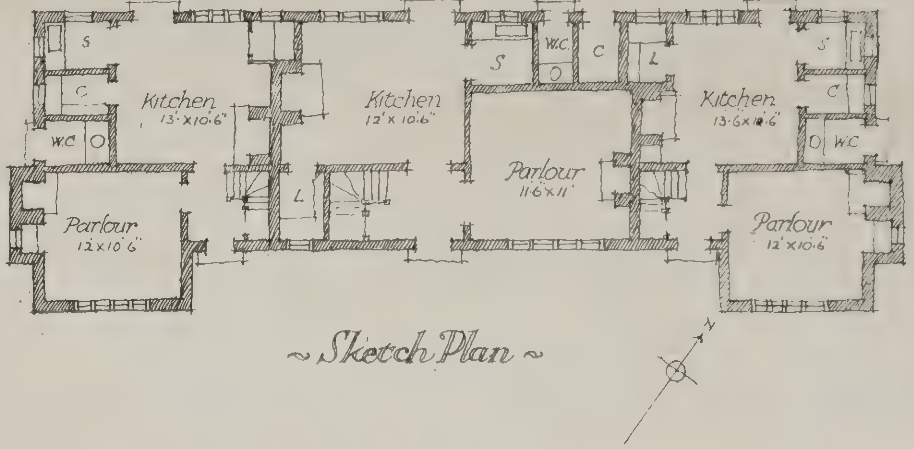
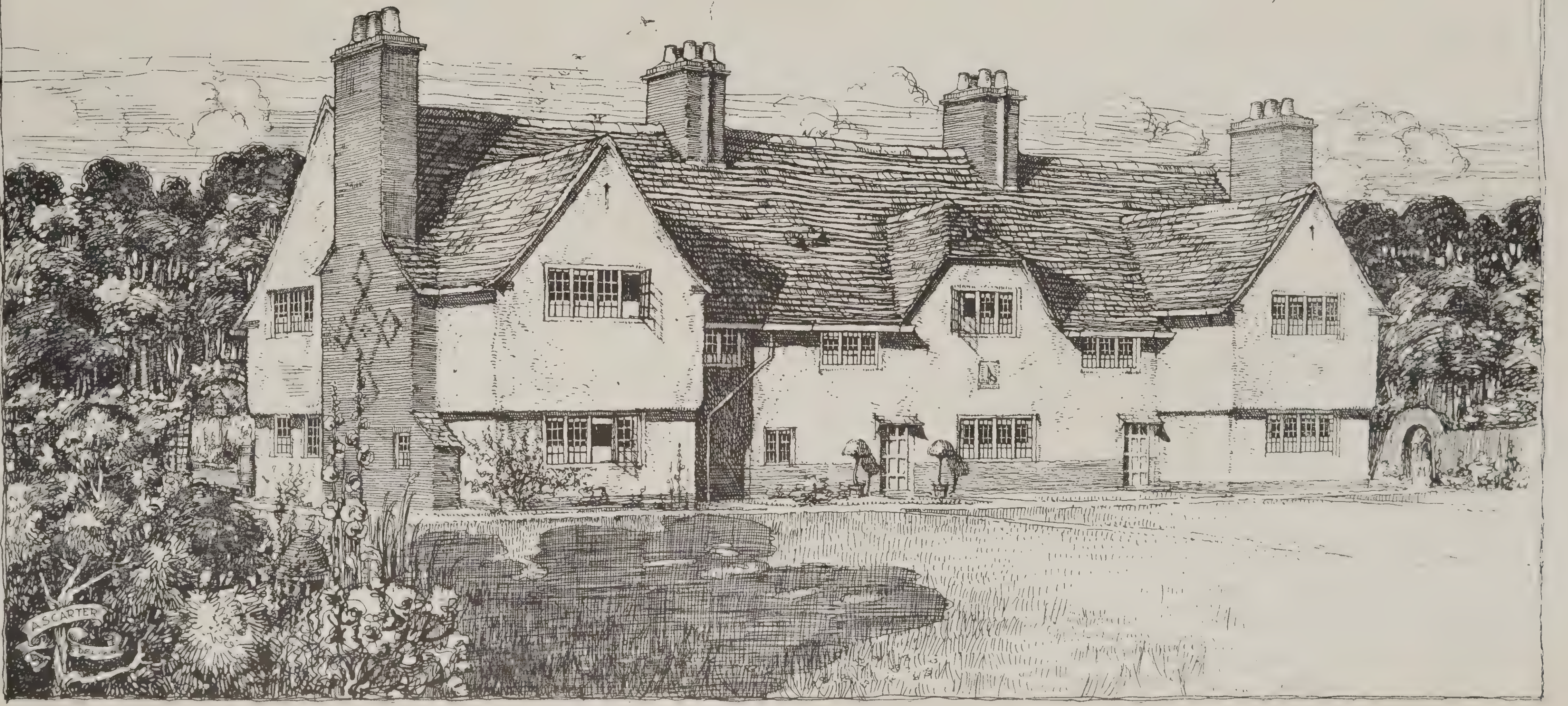


GROVPE OF COVNTRY HOMESTEADS.

ALEXDR. S. CARTER
ARCHITECT. 1906.



~ Sketch Plan ~



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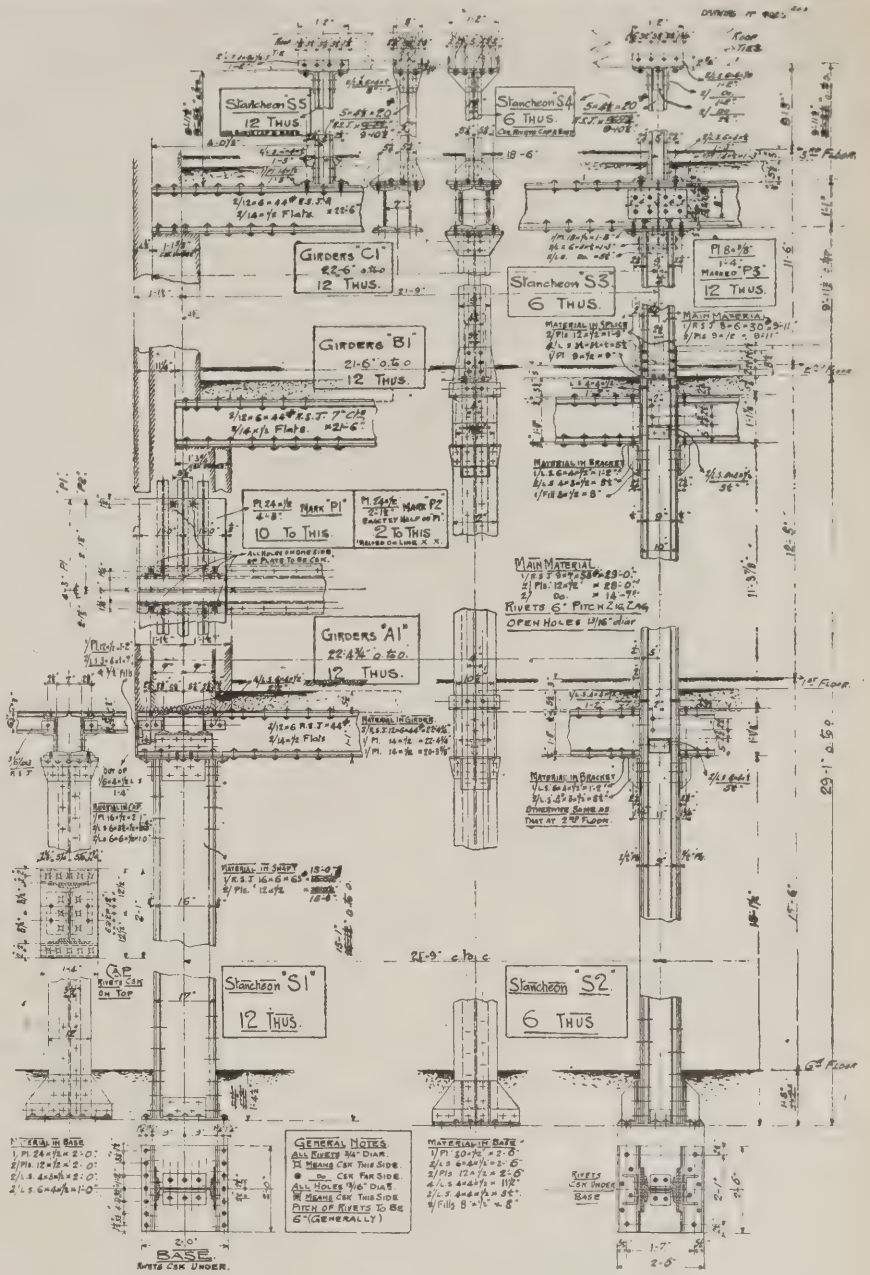
NEW PRINTING WORKS AT AYLESBURY.

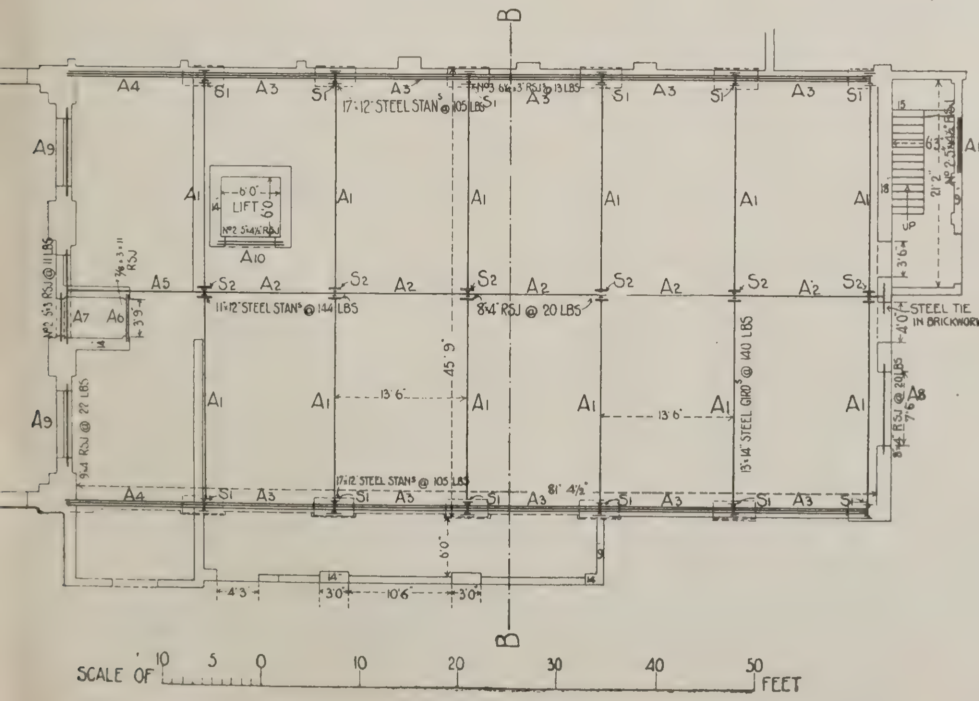
An Example of Rapid Construction.

The building illustrated by the accompanying drawings and photographs has just been completed for Messrs. Hazell, Watson & Viney, Ltd., and forms an extension of their printing works at Aylesbury. Mr. W. Ernest Hazell, A.R.I.B.A., of 5, Tavistock Square, London, is the architect. No time was lost during the erection, as will be seen by comparing the progress made with the dates of each view. The building was occupied about ten days before the final photograph was taken, on August 9th, the photographing of the finished elevation having been postponed pending the removal of some scaffolding which was needed for the erection of a crane, and which hid a portion of the building from view. Owing to surrounding buildings, the final photograph does not show the ground floor of the new extension. The ground floor is constructed entirely with steel stanchions, so spaced as to allow extensions on three sides when necessary, the bays between the stanchions being filled with wrought-iron sashes and light dwarf walls, easily removable.

All the floors are of reinforced concrete, constructed by the Patent Impervious Stone Co.; while the constructional steel work has been carried out by Messrs. Power's & Deane Ransome's, Ltd. The loads on the floors of the building being of an impulsive character, a greater margin of strength in the steel construction was allowed for than is usually adopted in the warehouse class of buildings. In the calculations the concentrated and vibrating loads were resolved into their equivalent dead loads. The centre stanchions were made in one piece from the ground to second-floor level, the inner plates ending at the centre of the second-floor girder, and the outer ones behind the brackets supporting the first-floor girders. This arrangement rendered the work of erection much more speedy, as only half the number of movements of the derrick pole were required, besides which the connections at the first-floor level were simplified.



DETAILS OF STEELWORK, BY POWER'S AND DEANE RANSOME'S, LTD.



Ground-Floor Plan.

NEW PRINTING WORKS, AYLESBURY. W. ERNEST HAZELL, A.R.I.B.A., ARCHITECT.

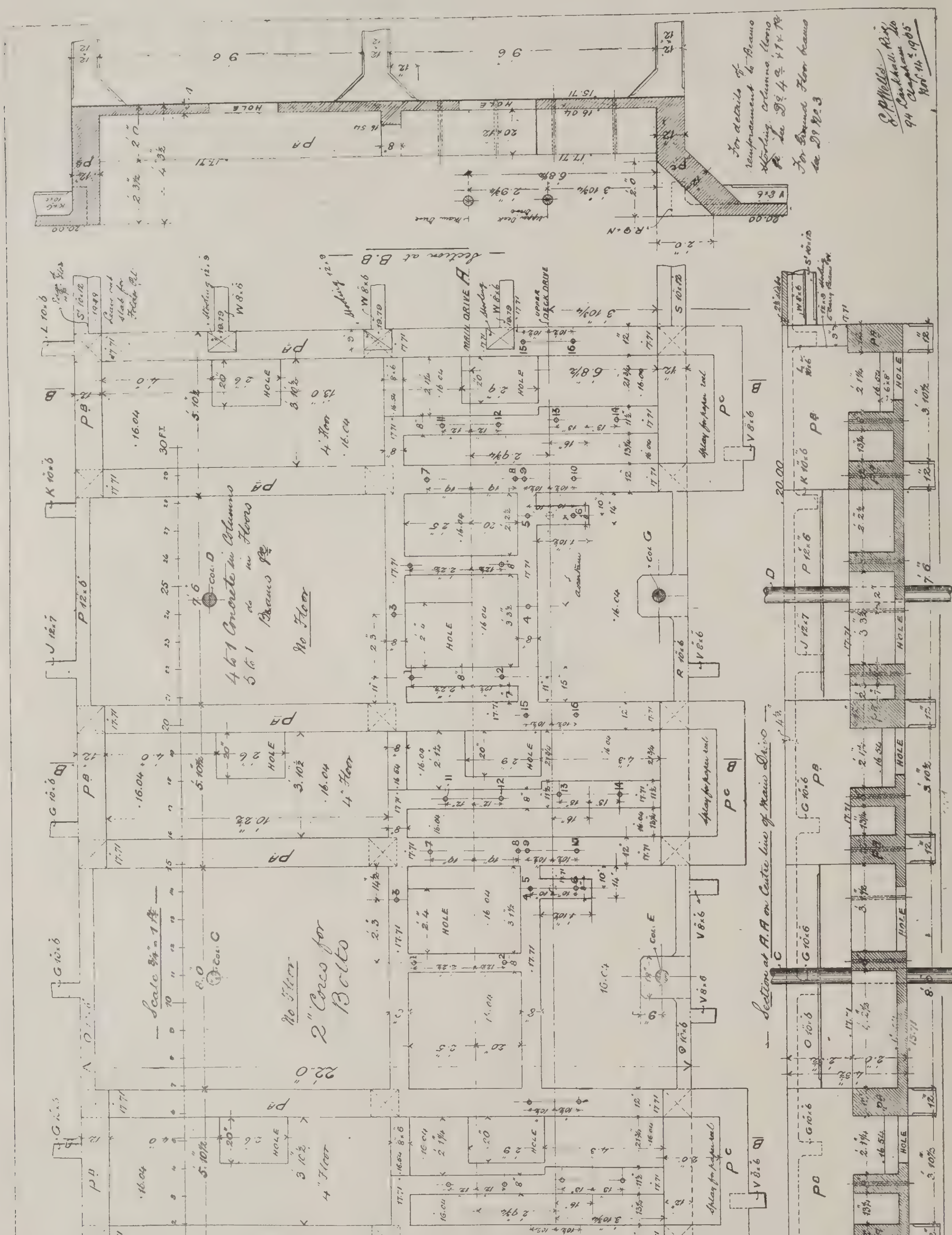
Owing to the small section of the stanchions supporting the roof above the third floor, the stanchions supporting that floor were not treated in the same manner, but terminated with a cap upon which the girders butted, and were fish-plated together. The base of the small stanchions were bolted to these girders, and formed an additional connection for the abutting girders they rested upon.

At the sides the large stanchions were only used as far as the first-floor level, above which the brickwork commenced, being built upon three small I sections.

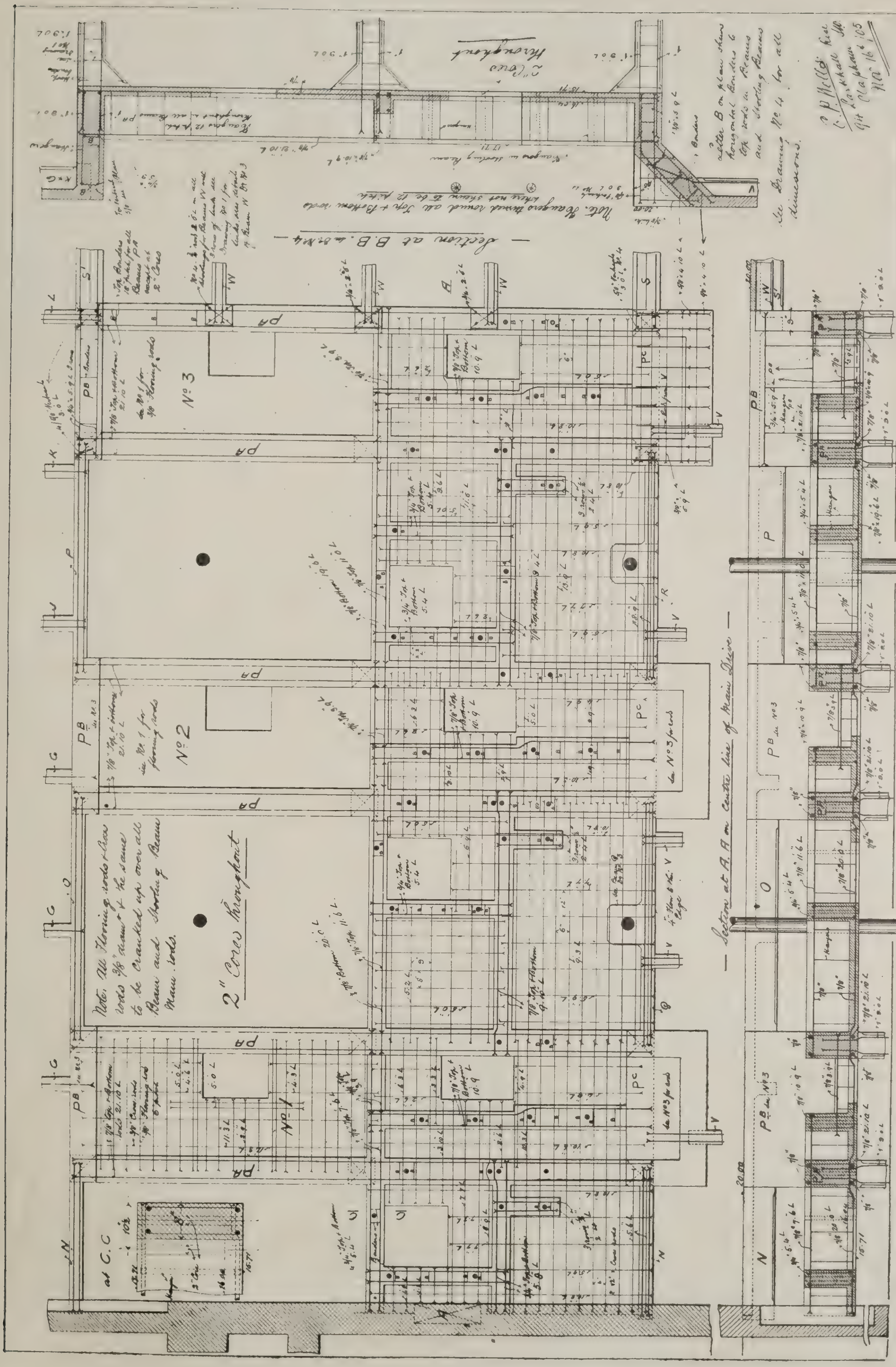
The details were designed with a view to having only rivets in vertical shear, bolts being used to hold the girders in position on the brackets.

Local red bricks, with Impervious Stone dressing, have been used for the elevations and Broomhall tiles for the roofs.

A goods lift and crane, electrically driven, have been erected by Messrs. A. W. Penrose & Co., Ltd.; high-pressure gas has been installed by Messrs. James Keith & Blackman Co., Ltd.; and steam heating by Messrs. Rosser & Russell, Ltd. The general contractors were Messrs. Sabey & Son, Ltd.


Section at B.B
Section at A.A on Centre line of Main Drive
Scale 3/4" = 1 ft
MAIN DRIVE A
UPPER DECK DRIVE
HOLE
No Floor
4" Floor
2" Cores for Bolts
Col. D
Col. E
Col. G
Col. C
20.00 Ground Floor
For details of reinforcement to Beams & columns see D° 4a, 4b & 4c
For Ground Floor beams see D° N° 3

ANNEXE, "DUNDEE COURIER" BUILDING, DUNDEE. WORKING DRAWING No. 4, SHOWING DETAILS OF PRESS PIT, BEAMS, FLOORS, &c., ON GROUND FLOOR.
CONSTRUCTED IN REINFORCED CONCRETE BY STUART'S GRANOLITHIC STONE CO., LTD. E. P. WELLS, ENGINEER. NIVEN AND WIGGLESWORTH, ARCHITECTS.


Section at B.B. on Dr. No 4
Section at A.A on centre line of Main Drive
Note. All Flooring rods & Cross rods 3/8" diam & the same to be cranked up over all Beam and Stooling Beam Main rods.
2" Cores throughout
No 1
No 2
No 3
PA
PB
PC
at C.C
N
O
P

ANNEXE, "DUNDEE COURIER" BUILDING, DUNDEE. WORKING DRAWING No. 4a, SHOWING REINFORCEMENT OF PRESS-PIT, BEAMS, STOOLING BEAMS, FLOORS, &c., ON GROUND FLOOR. CONSTRUCTED IN REINFORCED CONCRETE BY STUART'S GRANOLITHIC STONE CO., LTD. E. P. WELLS, ENGINEER. NIVEN AND WIGGLESWORTH, ARCHITECTS.

A REINFORCED CONCRETE NEWSPAPER OFFICE.

In the issues of our "Concrete and Steel Supplement" for May 23rd and June 20th last we published several of the working drawings for the reinforced concrete construction of the annexe to the "Dundee Courier" building erected in Dundee. These were as follows :—

No. 1. Framing plan of basement.
,, 2. Framing plan of ground floor.
,, 3. Details of ground floor beams.
,, 5. Framing plan of first floor.
,, 6. Details of first floor beams, &c.

We now publish further working drawings of this important example of construction, namely :—

Nos. 4 and 4a. Details of the press-pit, beams, stooling-beams, floors, &c.

Working drawings Nos. 4 and 4a are details of a particularly complicated piece of construction on the ground floor, the difficulty of which rendered it necessary to detail to a larger scale than the framing plans, and to show the setting-out and varying levels of the concrete work on one drawing and the reinforcing rods on another, for the sake of clearness. The floors of the press-pits and beams, as will be seen from these drawings, are of reinforced concrete, and they have to carry all the bearing blocks, pulleys, &c., for driving the three Goss printing presses which are here situated. The three gas-engines, two of 112-h.p. and one of 80-h.p., which drive the dynamos and printing presses, are situated in the basement, as shown upon the plan of that floor. The whole of the floors, as well as the roof, are calculated on the basis of an inclusive load of $2\frac{1}{2}$cwts. per sq. ft., the factor of safety being 4, excluding the concrete. The work was designed by Mr. E. P. Wells, who made use, where necessary, of his patent system of twin rods, consisting of two round rods united together by a diaphragm, split at the points of contraflexure, so that the top rod can be cranked up; the diaphragm is also punched with holes to allow the insertion of indented hoop-iron hangers.

The position of this annexe is shown on the ground-plan of the entire building, which was published, together with a perspective in our issue for May 24th, 1905. The general contractor was Mr. Stocks, of Dundee. The architects were Messrs. Niven & Wigglesworth, of 104, High Holborn, London. The contractors for the reinforced concrete work were Messrs. Stuart's Granolithic Stone Co., Ltd.

We have illustrated this building thus fully because, firstly, it shows the manner in which working drawings for reinforced concrete work are detailed as designed by a well-known English engineer; and, secondly, because it is interesting as an example of a building constructed completely in reinforced concrete, deserving careful study as embodying many features of constructive interest.

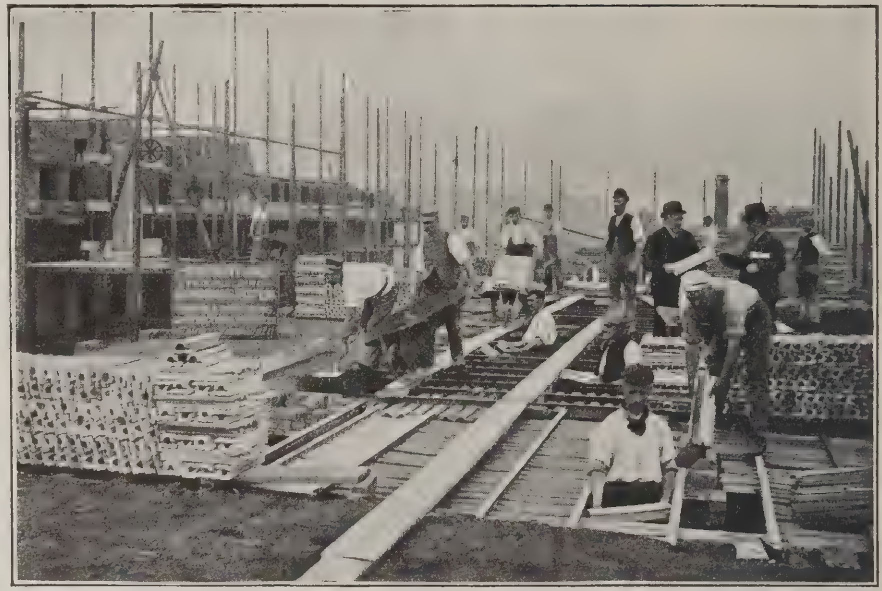


FIG. 2. HOLLOW BRICK FLOOR IN COURSE OF CONSTRUCTION.

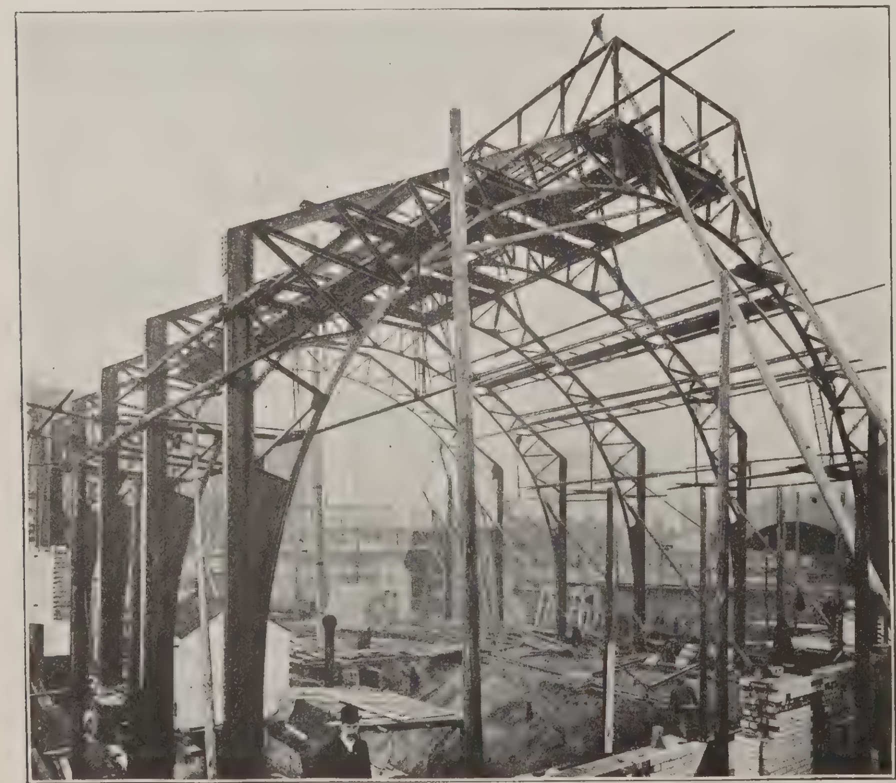


FIG. 1. STEEL ROOF AT HAGGERSTON PUBLIC BATHS.

REINFORCED CONCRETE SYSTEMS.

VI.—Homan & Rodgers' System.

Although it is only comparatively a few years since Messrs. Homan & Rodgers introduced their type of reinforced concrete floor, this well-known firm have been intimately connected with the progress and development of concrete and steel construction from its earliest beginnings in this country; and their latest system must be viewed, therefore, not merely as a new one, but as a result of a great many years' experience, and a solution of many of the problems embodied in modern building construction. In using the words "concrete and steel construction" above, we do not mean them to be confined to the narrow limitation of reinforced concrete. We use them to cover the many-sided work of this firm in the use of steel in buildings, either as joists supported on walls (stanchions being used occasionally to add strength where space was too confined for a pier), steel roof trusses (of which Fig. 1 is an example), &c., in the partial system still general, and to within the last year or two exclusively adopted in building contracts in this country; and, finally, the complete steel skeleton-frame construction which Messrs. Homan and Rodgers were the first to advocate the advisability of introducing in order to satisfy certain conditions as a result of their study of American buildings.

Going back to the early history of the firm, its founder, Mr. Julius Homan, took out a patent in the year 1865 for the combination of rolled iron joists and plates to form combined girders. Although the idea met with a good deal of opposition at the time, it has been generally adopted, as we know now, and such built-up girders are used in place of the old type of girders formed with plates and angles. About this time, too, Mr. Julius Homan constructed concrete floors by laying small **T**-irons on the lower flanges of the joists, spaced 3ft. apart, and filling up with Portland cement concrete. This system of using **T**-irons is deserving of special note in connection with the latest system introduced by the firm, which we shall deal with later on in this article.

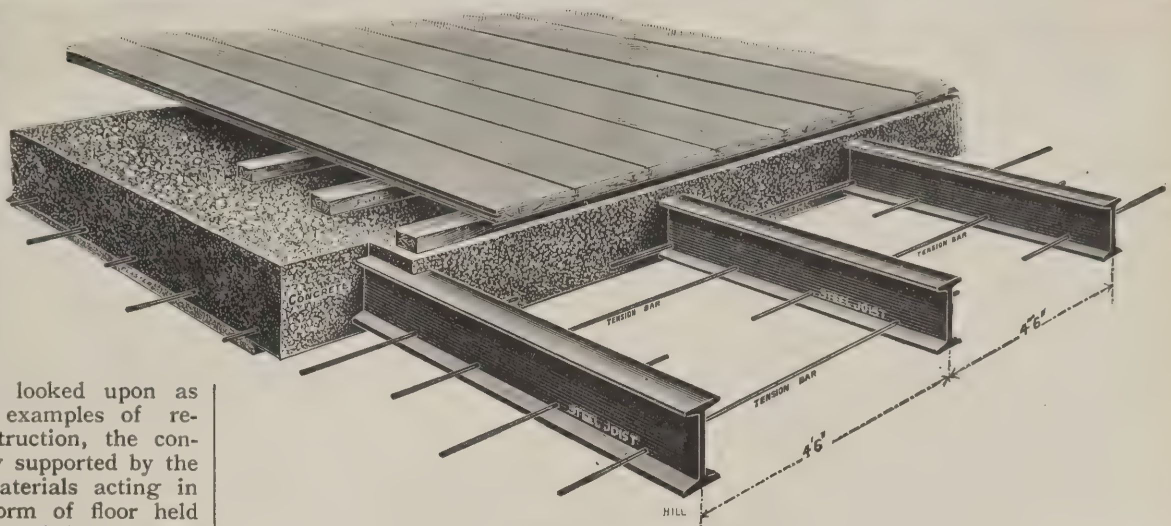


FIG. 3. INTERMEDIATE TYPE OF REINFORCED CONCRETE FLOOR.

In the early seventies Messrs. Homan and Rogers adopted the plan of using light iron joists about 3ins. deep, placed 1ft. apart, and bedded in concrete 6ins. thick. In this system the concrete was relied upon to take up the whole of the compressive stresses, while the small joists acted merely as tension members. Consequently, this may be looked upon as one of the earliest examples of reinforced concrete construction, the concrete not being entirely supported by the joists, but the two materials acting in combination. This form of floor held its own for many years, and the firm used it in more than 2,000 buildings.

As fire-resisting floors these gave very good results, for, in a great fire which occurred in 1861 at Messrs. Lorsont's leathercloth works, at North Woolwich, one of these floors resisted for some days the burning of the stock of oils, varnishes and other inflammable materials, and, in addition, withstood the falling walls and masses of masonry, saving intact the offices and warehouses, with a valuable stock of goods. A fire-proof floor at the Bradford Theatre, on the latter system, not only saved the music-hall built underneath from the fire of August, 1878, but actually resisted, without damage, the fall of the proscenium girder, weighing nearly seven tons, as well as the collapse of the heavy stone walls, the iron roof principals and the roof covering—in fact, the whole of the superstructure. At the Brighton Concert Hall, destroyed by fire in October, 1882, the fire-proof floor, on this system, received the whole of the debris from the superstructure, and saved the wines stored beneath—not a bottle being broken. A good many similar instances might be cited, but it will be sufficient to state briefly that on every occasion where these floors have been subjected to the test of a fire they have stood and arrested its further progress.

In the year 1885 Mr. Julius Homan took out his first patent for brick floors, which form of floor was constructed by him more than three years before any similar floor was introduced. Such floors possess the advantage of dispensing with the usual timber centering, and, consequently, can be very rapidly executed; this can also be used for repairing or renewing a floor where the compartments below must remain undisturbed and undamaged by falling materials or the dripping of water used in mixing concrete. When finished, the ceilings present an unbroken sheet of fireclay to any flames that may attack the floor from below. The construction of this floor is as follows:—Solid rolled steel joists are placed 1ft. 6ins. apart on the walls or main girders. These joists vary in section from 4ins. deep to 10ins. deep, according to the span. Between them, supported on the lower flange, are laid hollow bricks made from fireclay, and the concrete filled in to a total depth of not less than 6ins. The strength of this combination is remarkable, resulting from the fact that the whole of the tensive streses, the resulting strength whilst the concrete resists the compressive stresses, the resulting strength being in some cases 50 per cent. in excess of any calculation based on the transverse strength of the steel joists taken alone—consequently effecting a saving in the amount of steel. Being a flat floor there is no thrust, but the walls are securely tied together. Many failures in great fires have been due to the use of arched systems of floors thrusting out the walls. In all arches there is thrust,

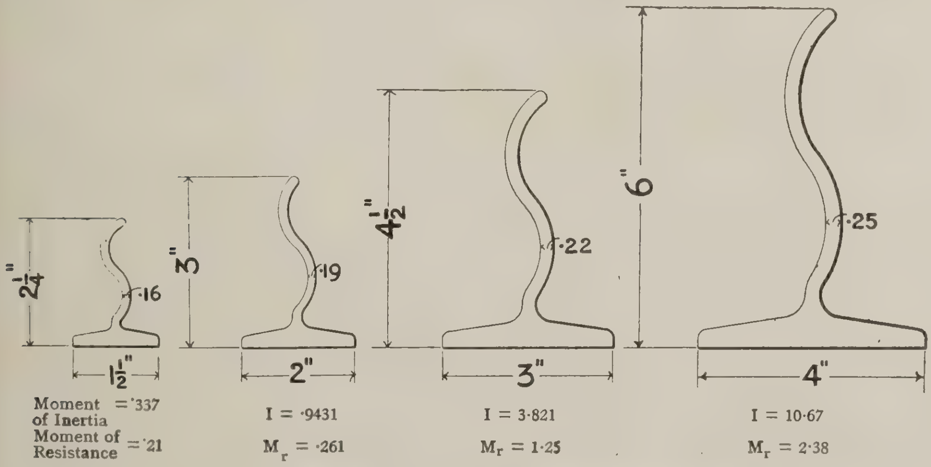


FIG. 4. SECTION OF WAVED-TEE REINFORCING BARS.

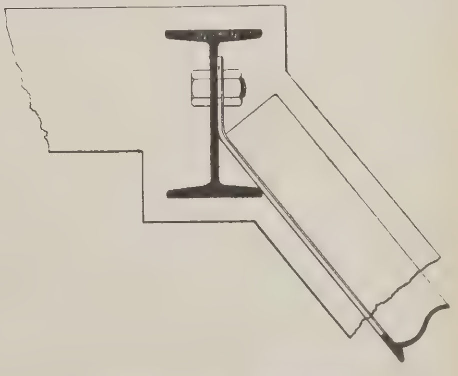


FIG. 6. CONNECTION FOR MANSARD ROOF CONSTRUCTION.

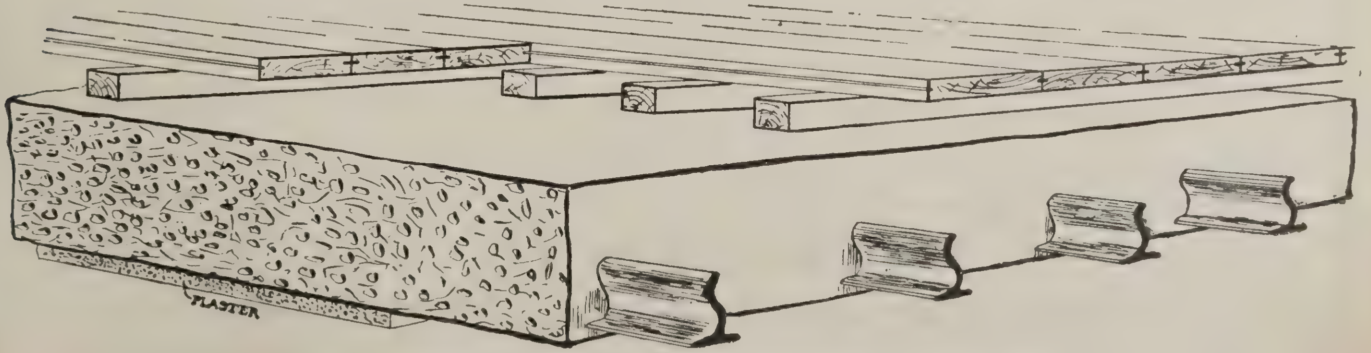


FIG. 5. PERSPECTIVE VIEW OF WAVED-TEE REINFORCED CONCRETE FLOOR.

and the flatter the arch the greater the thrust. Fig. 2 shows one of Messrs. Homan & Rodgers' hollow brick floors in course of construction at a block of workmen's dwellings erected by the Guinness Trust, in Brady Street, Borough, S.E.

An Intermediate System.

Such work as referred to above is reinforced concrete of a kind, but the tendency of recent years has been towards reducing the amount of steel; and firstly we may deal with the type of reinforced concrete floor used until recently by Messrs. Homan and Rodgers in a great many buildings. This is shown in Fig. 3. It will be seen that steel joists are used at 4-ft. 6-in. centres, the webs being pierced with holes through which steel tension rods are inserted. These tension rods, it will be observed, are in short lengths, sufficiently long to leave about 1ft. 6ins. projecting on the outsides of the joists so as to give a good bond into the concrete of the next bay. The rods are placed alternating, as shown. Such a form of floor is cheap.

Views on Reinforced Concrete.

In Messrs. Homan and Rodgers' view, reinforced concrete construction furnishes very favourable results when carefully executed; but there is considerable risk of a failure if left to the ordinary workman, on account of the trouble of placing the rods in their correct position. Another objection is the length of time required for the concrete to become thoroughly set before the centering can be removed, because the stability of the floor, without any regard to the load it will be called upon eventually to sustain, depends upon the strength of the concrete. This entails either very slow progress of the work or great expense in providing sufficient centering to enable the work to be carried out with reasonable speed. Architects often raise the objection that, in the event of any defect in the concrete, a collapse of the whole structure is likely to occur. A further drawback suggested is the great depth required in long spans, though this is met to a great extent by top reinforcement. The fact, of course, is that there are many sides to the question of reinforced concrete construction. Economy is effected by various considerations, one of the most important being that of centering; another, surety that the reinforcement shall be in its proper position when executed by unskilled labour, and, as a corollary, the saving of expense in supervision; thirdly, the desirability of a simple—indeed, almost rough and ready —system of construction so as to economise labour and guard against error.

The Latest System.

It was with a view to reducing the steel to the minimum amount, and yet meeting such objections and defects, that Messrs. Homan and Rodgers brought out a few months ago the waved-tee type of floor. The section of the reinforcing bars in this system are as shown in Fig. 4. It will be seen therefrom that four sections are adopted. The tensile stresses are taken by the steel bars, while their special form obviously prevents them being drawn out or parting from the concrete, at the same time giving them sufficient rigidity to support the concrete and allow the centering to be removed much sooner than when rods only are used. The waving of the web considerably increases the transverse strength of these bars, as will be seen from the comparison of their moment of inertia with that of a similar tee section with a straight web; but the waving of the web, as above stated, binds into the concrete and takes up shearing stresses. The web is thin, so that the bulk of the metal is placed in the most economical position—namely, as near the underside as possible.

The firm claim that this floor is the most economical on the market, and they are prepared to furnish estimates either for the construction of floors alone, or to include the main girders and other constructional steelwork.

How Constructed.

The perspective view (Fig. 5) shows the manner in which a floor is constructed on this system. There is no special connection needed between the tees and the beams, but if it is desired to tie the latter together in any particular circumstance, tie-rods are introduced, bolted through the webs of the main beams; or the tees are notched so as to enable them to be riveted to the main beams.

A Roof Detail.

Fire-resisting roofs are now required in a good many buildings, especially in London, to meet the requirements of the Building Act. The way in which Messrs. Homan & Rodgers conform to the necessity of attaching their bars in the construction of a Mansard roof is illustrated in Fig. 6. It will be seen that this is a very simple system, and yet admirably effective.

Calculations

With regard to the calculations for members with reinforcements of this special shape, being of large section, the usual formulae as applied to rods of small section have to be somewhat modified; but it is out of place for us here to enter into detail. The modifications have been dealt with in various books on the subject, and those with a special knowledge will be able to see the advantages which the waved-tee bars offer. Messrs. Homan & Rodgers use the $2\frac{1}{4}$-in. by $1\frac{1}{2}$-in bars for spans up to 8ft., spacing the tees 1ft. 6ins. apart. The next size, 3ins. by 12ins., they use for spans up to 10ft., spaced 1ft. 6ins. apart for the maximum distance, or wider apart for shorter spans. The two larger sections are used for heavy loads and long spans. We would call attention here to the advantages which tee bars offer in the design and construction of reinforced concrete chimneys and arched bridges. This new waved section should be specially noted by designers of this class of work.

Aggregates and Cement.

In regard to other matters in the practical construction of concrete and steel floors, Messrs. Homan & Rodgers have investigated all branches of the subject for many years past, and it will be of interest to record some of the results of their experience :—

In their opinion the best aggregate for concrete floors is broken firebrick, pottery, brick, or similar material. Although the first cost is considerable, the strength of the concrete is very much greater than when made with clinker, ash or coke breeze. These latter aggregates, moreover, are open to the very serious objection that any material containing sulphur has a most deleterious effect upon cement, frequently causing the concrete to expand and irretrievably damaging the building in which it is used.

With regard to cements and their suitability for the construction of reinforced concrete, they consider that they should be absolutely free from uncombined lime, fit for immediate use when delivered, and should pass the following tests (the temperature of the room where the tests are made being kept between 60° and 65° Fahr.):—

The specific gravity of the cement when delivered to be not less than 3. The weight of the litre of cement to be not more than 1,050 grammes.

The tests for fineness of grinding to be made upon samples weighing 100 grammes. Siftings to be done through standard sieves of

76 by 76=5,776 meshes per sq, inch.
180 by 180=32,400 „ „ „ „

All must pass through the 76 by 76 sieve and the residue must not be more than 14 per cent. on the 180 by 180 mesh sieve.

Setting.—600 grammes weight of cement to be spread out in crater form on glass; into the centre of the crater thus formed, pour all at once 25 per cent. of drinking water (150 cubic centimetres), The mixture to be well worked with a trowel for five minutes reckoned from the time of pouring in the water. With a portion of the paste thus obtained, fill a mould in the shape of a truncated cone 8 centimetres diameter at the base, 9 centimetres diameter at the top, and 4 centimetres deep, the surface of the cement to be smoothed with a trowel. Immediately the surface of the cement is smooth, the mould containing the cement is to be immersed in a bath containing water, of which the temperature is to be kept between 60° and 65° Fahr. The box is to be taken out of the bath only during the time necessary to make the test.

For the setting test a Vicat needle to be used having a smooth, flat, square end, one millimetre square and weighing 300 grammes. The cement will be considered as set when the needle does not appreciably penetrate it. The time for setting to be reckoned from the moment that the water for mixing the cement comes in contact with it. If the cement sets under the above conditions in less than three hours the cement will be rejected. It will also be rejected if it does not set within twelve hours.

Cold Test for Change of Shape.—Immediately after the mould has been filled for testing the setting, part of the same gauging is to be placed on glass in circular pats about $1\frac{1}{2}$ centimetres thick in the centre and with thin edges. Directly the pats are made, the plates of glass and the pats upon them are to be placed in drinking water of which the temperature is kept between 60° and 65° Fahr If any cracks or fissures appear in the pats or if the edges of the pats are raised and detached from the glass the cement will be rejected.

There are other tests, to which Messrs. Homan & Rodgers submit their cement from time to time, such as the hot-test for change of shape, tensile strength, &c.; but the tests set out in detail, as above, are extremely important.

Buildings Executed.

Among the many important buildings in which Messrs. Homan & Rodgers have recently erected floors, we have only space to mention the King's Sanatorium, the Ecclesiastical Commissioners' new offices, the new building for the Liverpool, London & Globe Insurance Co. in Cornhill, E.C., and Shoreditch Town Hall. We give below a list of buildings, the floors of which are executed or in progress by Messrs. Homan & Rodgers, of Manchester, on the new waved-tee system, from which it will be seen good progress has been made, although the system was only introduced such a short time ago.

SCHOOLS.—Letherland; Levenshulme; Hill Top; Burslem; Draylsden; Brunswick Council, Cambridge; Broomhall, Nantwich; Barnton, Northwich; Alvaston; Derby; Thatto Heath; cookery centre, St. Helens; school of art, Burslem; science school, Warwick.

HOTEL.—Holmbrook, Preston.

DRILL HALL.—Birkenhead.

WAREHOUSE.—Compton Mills, Leek.

MILL.—Borrowash, Derby.

CHURCHES.—Welsh C.M., Hammersmith; Congregational, Burslem.

OFFICES —Crown Street, Liverpool.

SAVINGS BANK.—Preston.

INFIRMARIES.—Workhouses at Atherstone, Clatterbridge, Boston, Coventry, Otley, Brentford.

WORKHOUSE.—Brentford.

MISCELLANEOUS.—Nurses' Home, Rotunda, Dublin; Rockside Hydro, Matlock; Summit Works, Walsall.

A Correction.—In the article entitled "Reinforced Concrete Sewers, Conduits, &c., built *in situ*," published in the "Concrete and Steel Supplement" to our issue for September 12th, an error occurred on p. 61. The paragraph near the bottom of the third column should read :—"If meshwork be used, it should be diamond shaped and laid so that the diagonals of the mesh run one with and the other at right angles to the periphery of the pipe, in which way a reinforcement of helical members crossing each other is obtained."

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Age and Experience. THIS subject is a fruitful source of discussion among all sections of the community, and it will bear considerable thought on the part of members of the building trade and the architectural profession. It seems to be becoming an accepted doctrine among employers of labour that this is the age of young men, and many able craftsmen find themselves in want of employment when their knowledge has been matured and they still possess plenty of vigour and initiative. It is regrettable from every point of view that the abilities of craftsmen trained under the apprenticeship system (which has not yet been bettered) should be lost. We still need good work, notwithstanding the constant endeavour to rub along with the minimum of effort and to secure the maximum of outward show at the least cost. We need to recognise that the building craftsman is like other artists, such as painters and sculptors—theory is not everything; practice is also needed in his education. There is of course a tendency for age to stagnate a man's initiative, invention and energy, but this does not necessarily follow. There are any number of examples of men whose work when they have reached old age has the appearance of being produced in the full flower of manhood. A young man, of course, is not necessarily inexperienced. The foreman and clerk of works, because they do not favour new methods, are often replaced by younger men, but their experience is invaluable in routine. The fact that age need not mean stagnation should urge the worker to keep alert and the employer to judge a man on his merits.

The Ingenuous Building Act Committee. OUR readers will remember that, with the exception of Part VIII., relating to the means of escape in case of fire and the reduction of fire risk in buildings, the London Building Acts (Amendment) Bill of 1905 was withdrawn on the second reading, as the London County Council found the Bill met with such great opposition. In April, 1905, the Council did what it should have done before—it sent the City Corporation, the metropolitan borough councils, and other authorities and associations concerned, copies of a document showing the effect of the Bill on the existing Acts with a view to an amended Bill being introduced as soon as possible. The Building Acts Committee of the Council has had under consideration for some time the observations elicited in response to the Council's invitation, but it is now stated that, owing to the magnitude of the work, it will not be able to report in time for a complete Bill to be introduced in the next session of Parliament. Moreover, the Committee thinks that the experience gained in connection with the 1905 Bill shows conclusively that it would be very difficult, if not impossible, to pass in one session of Parliament a Bill dealing with the whole of the amendments required. We have never thought the Building Act Committee (nor the Council) particularly sensible in its dealings with this matter; both having betrayed a wonderful disregard for outside opinion, although they have asked for suggestions, possibly with the idea that they would thus be prepared to meet the points which might be raised in opposition. They have occasionally also displayed unseemly haste, and whoever has been responsible for the framing of the amended by-laws seems to have been oblivious to the real practical reforms needed, to have been influenced merely by a desire to smooth out certain points of difficulty in the interpretation of the existing Act, and generally to get Parliamentary sanction for the Council to make any by-laws it wishes from time to time. It seems to be considered diplomatic not to divulge all the details of the Council's real designs on the public, but the latter cannot be blamed if they assume such action to be underhand. If the Council is honest in intention and reasonable in desire, why should it be afraid to court the light of day? The detailed clauses ought to be inserted in the Bill. If logical, they must be admitted, but the public object to giving the Council *carte blanche* to do as it pleases with them. The same secrecy, want of consideration and unreasonableness seem to be still followed by the Committee. Notwithstanding the fact that the existing Act results in great inconvenience to the public and the architectural profession, and needlessly increases the cost of erecting buildings in London, the Committee calmly puts aside this larger question in order to push through two smaller matters which its officers, and the members of the Council, seem to set themselves against, because they detract from their authority and act as a check upon the Council for the benefit of the public. These two matters, the Building Acts Committee evidently thinks, are of foremost importance, because an amendment of the law is sought without further delay. The matters in question are the constitution of the Tribunal of Appeal and the remuneration of district surveyors. The Committee gives itself away when it states that, if a satisfactory amendment of the law in these two respects can be secured, it will greatly facilitate the work of formulating proposals with regard to the other necessary amendments. As an additional reason for urgency, the Committee refers to the fact that a considerable number of district surveyors' districts are now vacant, and that it is desirable that the temporary arrangements made for the supervision of these districts, in view of the possibility of securing at an early date legislation with regard to the mode of payment of district surveyors, should be terminated as soon as possible. It therefore proposes a Bill in the next session to amend the Building Acts in these particulars. The proposals are not new. They have already met with strong opposition from the architectural profession, who do not desire to see both the Tribunal of Appeal and the district surveyors dominated by the Council's wire-pullers. In such proposals the Council may expect to meet strenuous opposition in Parliament. The public need to be on the alert to see that they are not still further domineered over and interfered with by the red-tapeism of the London County Council.

R.I.B.A. EXAMINATIONS.

Model Answers by A. G. Bond, B.A., A.R.I.B.A.

(Continued from page 143, No. 607.)

The Final Examination.

Subject III.—THE NATURE AND PROPERTIES OF BUILDING MATERIALS.

[*Time of examination, one hour and a half. Maximum number of marks, 50.*]

(1.) Give a list of the different qualities of lime used for making mortar and the proportion in which each is mixed: state whether the proportions are measured before or after the lime is slaked. What difference in bulk does the slaking of each kind produce? What variation would you make in the proportions when a mortar mill was to be used?

The limes used for mortar are those which have the character of "hydraulicity." *Stone limes* possess this character in a small degree and will make a fair mortar for work above ground: they are used in the proportion of 1 of lime to 2 or 3 of sand: a well-known example is the grey stone or Merstham lime. *Hydraulic limes*—especially those from the "lias" formation, known as "blue" and "white"—are the best limes for mortar. For work below ground 1 of lime to 1 of sand is the usual proportion; for other work the quantity of sand may be doubled or trebled. Hydraulic limes are classed as "feebly," "moderately" and "eminently" hydraulic, according to their degree of hydraulicity: a well-known example is the Keynsham lime. *Selenitic lime* contains a varying proporportion of gypsum (a sulphate of lime), also called "selenite," which may be mixed with a larger proportion of sand without loss of strength (4 to 1 makes a strong mortar): it should be mixed in a mill where possible. The proportions given above are for the dry lime and sand before the former is slaked. Slaking is found to require about 1½ gallons for every bushel of lump lime (besides that required for mixing). This represents the consequent increase in bulk. The lime is heaped and carefully watered, and the measured quantity of sand put over it to keep in the heat and moisture. The time allowed for slaking depends on the nature of the lime: hydraulicity reduces and retards slaking. A mortar mill, by ensuring perfect grinding of the lime and perfect mixing of the ingredients, enables the proportion of sand carried by the lime to be made greater, about in the proportion of 4 to 3 as compared with hand mixing.

(2.) State the method of ascertaining the proportion of cement to aggregate in making reinforced concrete, and the reason why fineness improves the strength of cement. Describe briefly the process of making cement.

Theoretically there should be no voids or interstices in concrete, and this is especially important in the case of concrete used for upper floors and in conjunction with steel, &c. Hence the matrix should be of such proportion to the aggregate as to completely fill the interstices of the aggregate when dry. If the aggregate were all of larger size (the largest used in the cases referred to should not exceed ¾in.) it would be generally advisable to add sand in equal proportion to cement, but as a rule broken materials are used for aggregate and there is consequently sufficient sand or brickdust, &c., in the aggregate, so that sufficient neat cement should be allowed to fill the whole of the interstices. With regard to fineness of grinding, a tendency to expand when set is often due to free lime contained in the larger particles, which have practically no cementing power and, owing to their size, resist the slaking action of the air: fineness of grinding also helps the cement to penetrate the smallest interstices, and in this way increases its cementing value. Portland cement is made in two ways:—(i.) In the *wet* process chalk and clay are ground together in water (in varying proportion according to their composition), dried, burnt at high temperature, and ground to fine powder. (ii.) In the *dry* process the materials are ground, made into lumps with very little water, burnt, and ground fine as before.

3. Describe the methods of preparing the materials of which bricks are made, and the processes of wet (or slop) and dry (or Fletton) brickmaking. In what respect do the bricks produced by the two methods differ and which do you prefer, and why, and for what purposes?

The methods differ in different brickyards, and it sometimes happens that the clay can be used without preparation and artificial mixing, as, for instance, at Conyer, near Sittingbourne. Here the clay is dug and tipped into a pug-mill (mixed with a little coaldust for fuel) and passes thence direct to the moulding machine, then to a long drying chamber, through which the bricks pass slowly on a special truck, and afterwards to a tunnel-shaped kiln. In this case the whole process only occupies about five days, the result being "stock" bricks. In other cases several extra processes may be found necessary, as, for instance, sifting to get rid of stones, washing and grinding in a washmill in which the clay is churned by revolving beaters, and before moulding it may be partially dried and mixed with any desired element which is absent in the natural clay. In other cases the processes are varied, but with the same objects in view: for instance, they may be hand-moulded and be dried in "hacks" without artificial heat, and burnt in "clamps." In "slop"-moulding the mould is wetted to ensure the easy removal of the brick without damage. In dry moulding the mould is sanded for the same purpose. Flettons are manufactured from a deep bed found in the Peterborough district, and are machine-made and kiln-burnt. They show the fire mark very plainly, and for facing are therefore somewhat unsightly. The machine making causes them to be too smooth to form a good key for plaster, so that they are often moulded with grooved surfaces to give an artificial key: they are heavy owing to the absence of a "frog." The slop-moulding process is apt to cause surface cracks and the resulting bricks often lose their shape.

4. Give a list of the qualities which you would require in a building stone (a) for a public building in a manufacturing city and (b) for a country church.

It is presumed that internally the same qualities would be required in both cases. The following are qualities that may be looked for in a building stone to be used externally, disregarding the question of cost:—(i.) *Durability:* which may be, in the same stone, considerable in the country but almost nil in a town atmosphere: but it is a quality that would be essential in both cases and tests would be made suitable to the conditions which the stone is required to fulfil: non-porosity would be an important quality for use in the acid atmosphere of a manufacturing town. (ii.) *Strength:* Resistance to crushing is not usually of importance in a stone used for dressings, but owing to the greater height of town buildings it sometimes is of more importance here than in the less lofty country building; it may, however, have an importance in the case of isolated columns, &c., in a church. In neither case would resistance to friction be of importance, though on exposed coast situations blowing sand would have a disastrous effect on some stones. (iii.) *Good appearance:* This is a quality which would most probably be required in both cases. One must consider the situation of the stone and its use: for general walling a good hard rubble stone is frequently used in churches, but for a public building in a town ashlar work of good sandstone would probably be best; for dressings in either case one would require a freestone, the softer limestones being only suitable for country work.

[Note.—If time permitted the student could enlarge upon the above qualities by subdividing them, *e.g.*, the qualities which make for durability could be set out, hardness, toughness, homogeneity, crystalline structure, close and firm texture, and those which make for good appearance, such as colour, surface-texture.]

5. In a tabular form give a list of the different kinds of timber used in construction, arranged in order of strength. Give the purpose each is best suited for and the methods you adopt to see you get the qualities you specify.

The following is a selection of hard woods and pine woods in common use, in the order of their resistance to crushing. The crushing strength ranges approximately from 4 tons down to 2 tons per sq. in.

Hard Woods.		Pine Woods.	
Teak	3·8	Pitch Pine	2·9
English Oak	3·2	Memel	2·9
American White Oak	3·0	Fir...	2·5
Mahogany (Honduras)	2·8	Larch	2·5
Maple	2·7	Riga	2·3
		American Red Pine...	2·2

[Note.—The student would not of course be expected to remember the exact crushing weights; a general statement such as that given above would be sufficient.]

The best timbers for particular purposes may be given as follows:—For general constructive purposes the pines are all useful, and where great constructive strength is required oak, teak and pitch-pine, but not the last-named for cross-strain. For exceptionally dry situations the pines, except pitch-pine, and mahogany and sycamore. For use in water cedar, memel, elm, oak and teak. For street paving, jarrah. For wood-block floors, oak, maple, pitch-pine. On the whole, yellow deal is a good all-round timber, but for strength, durability, stiffness and appearance combined, oak and teak cannot be beaten. In specifying timber for general purposes, it is best to mention the defects that are to be avoided, and to examine the timber both when stacked and when being cut up, in order to ensure that these defects are absent. Examine timber before it is primed. Specifying the "ports" can only be useful when the architect has a considerable knowledge of timber, and it may safely be said that many of the clauses commonly inserted in specifications are really obsolete. If timber from certain ports is specified, however, in particular cases, the architect should know the brands and should examine the timber so as to make sure that it bears them: this can, of course, only be done in the stack. There are many methods for noting defects, decay, &c., such as tapping and noting the sound conductivity, while the exposure to the sun will emphasise shakes. Substitution of inferior kinds of timber can often be detected by weight: spruce is much lighter than yellow deal, and Cuban mahogany is twice as heavy as baywood or Central American.

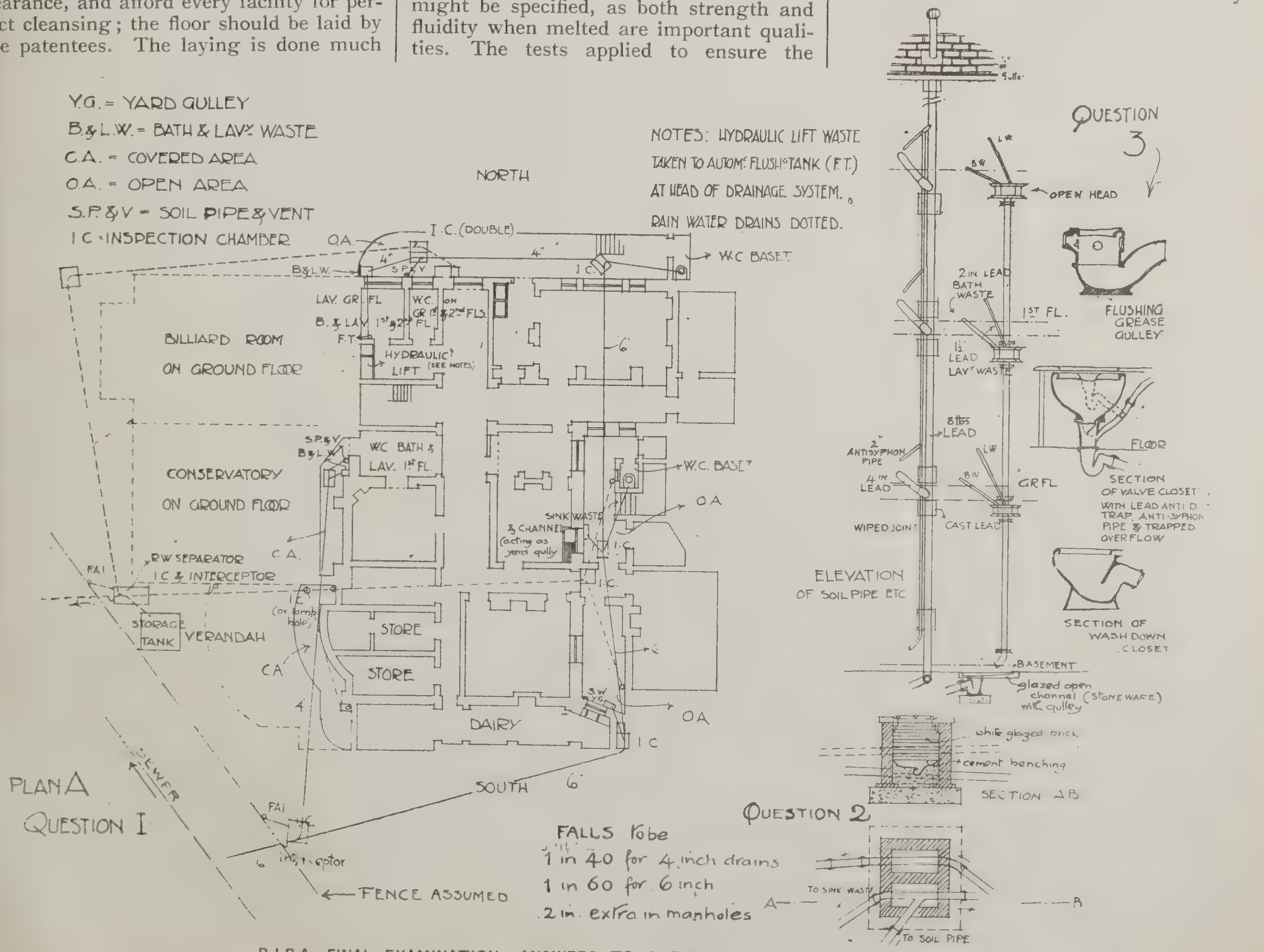
6. Give a list of the materials you would specify for floor, walls and ceiling of an operating theatre, selected for their non-absorbent qualities, and describe the method of laying or securing them and the final treatment of their surfaces.

In the case of each of the positions mentioned, floors, walls and ceilings, the specification would vary according to whether we were dealing with (a) entirely new work, or (b) an old building being brought up to date. Stress should be laid on the choice not only of the materials themselves designed to form the finished surfaces, but on the material forming the joints. Other things being equal, it is generally best to choose jointless materials; thus, for floors, I should specify that they should be finished in one of the several modern jointless floorings: these are not only non-absorbent, but are laid without joints of a different material. Moreover, they are not so cold as a cement floor, are of more pleasing appearance, and afford every facility for perfect cleansing; the floor should be laid by the patentees. The laying is done much in the same way as cement paving.

Again, in the case of walls, glazed tiles and glazed bricks are good; but it is impossible, even with neat cement, to ensure an absence of absorbent parts in the jointing, and difficult to entirely obviate dust and germ-collecting surfaces, owing to the slight unevennesses of the jointing material. I should prefer, therefore, to specify neat Parian or Keene's cement on a backing of Portland cement and sand, or coarse Keene's, &c. Old plaster might be made practically non-absorbent by covering it with a white metal sheeting with a hard, impervious elastic glaze, laid in large sheets with a special paste, and having few and closely-butted joints.

7. Specify the different qualities of steel and cast-iron you would use for a building of glass and metal, to be used as a winter garden, and the methods you would employ to check the quality and weight of the material when it is delivered on the site to ascertain that it was in accordance with the specification in all particulars.

The metal used, though in modern practice it might be of wrought-steel throughout (solid steel columns being now in use), may be regarded for the purpose of this question as being of four kinds—(a) for the vertical supports, either cast-iron or steel; (b) for the roof construction, rafters, &c., wholly or partly in compression, mild steel, rolled; (c) for the tensional parts, wrought-iron; (d) for the ornamental parts of the design, cast-iron. For cast-iron columns a mixture of what are known as No. 1 and No. 2 pig-metal might be specified, as both strength and fluidity when melted are important qualities. The tests applied to ensure the qualities required would be made on samples chosen at random, and would be roughly as follows:—A trial with a file, or a blow with a hammer, would indicate the degree of toughness or brittleness; and the light or dark-grey colour would be an indication of these qualities respectively. Careful examination of the surface (at the works, before painting) will be a necessary test for flaws, and trial with the blade of a knife will indicate soft parts, due to too much carbon. Bad mixing will be indicated by unevenness of surface. The transverse strength of test bars made from the same melting as the columns may be tested for deflection and fracture. For the mild steel in the roof, &c., Siemens-Martin steel might be specified, of British manufacture, of ultimate tensile stress of 28 tons per sq. in., with a minimum contraction and extension in length at time of fracture. Corresponding tests would be made on samples arbitrarily taken from each consignment. It might be specified in addition that the joists shall bend double cold without fracture, and certain bending and punching tests might be insisted upon. In this connection, it is worth noting that steel and iron may be distinguished by examination of fractured surface, by the use of dilute nitric acid to indicate the comparative proportion of carbon, and by hammering and chipping to ensure the proper toughness which steel should possess. Foreign joists sometimes owe their weight to an undue thickness of web; this can be guarded against by measurement; they must also be marked with the name of the country



R.I.B.A. FINAL EXAMINATION. ANSWERS TO QUESTIONS 1, 2 & 3, SUBJECT IV.

of their origin. Wrought-iron should be specified as Staffordshire best (or double or treble best, &c.). The usual tests are those to ensure tensional strength (20 tons per sq. in.), and fibrous rather than crystalline structure. The quality of cast-iron for the ornamental features would as a rule be left to the manufacturer, the appearance only being of first importance; hence fineness of grain, cleanness and sharpness of the impression, absence of surface flaws, would be the qualities demanded.

8. The painted stucco front of a high-class residence has got into bad repair. Specify the materials you would employ before re-painting to make good the places that were blistered and to make up the surfaces when the outer coat had perished before the work was painted. What are the causes of blistering, and how are they avoided or remedied?

There are two distinct matters requiring to be remedied—(a) the blistering or falling off in patches of the plaster, and (b) the blistering or decay of the paint. The causes of the former defect are (i.) damp walls, (ii.) particles of unslaked lime in the original plaster, (iii.) the use of inferior or unsuitable materials in the original plaster, (iv.) want of key between the first and finishing coats (the first coat should not be too dry before the finishing coat is laid). The causes of the second defect are (i.) too much oil in the paint on surfaces exposed to heat, (ii.) the surface of the cement not allowed sufficient time before the painting was executed (Portland cement should be allowed at least a year, or even two, before being painted); (iii.) insufficient time between coats of paint, or, in other words, there is a difference in the elasticity of the coats. In preparing the walls, care must be taken not to damage the parts that are sound, but at the same time all paint and plaster showing a tendency to scale must be removed by scraping. Sunk surfaces and cracks must be made good with Parian cement, and, before the last two coats of paint are put on, small holes, dents, &c., can be stopped with white lead and a colouring pigment. The surface of stucco takes four or five coats at least when new, and old work generally requires three coats, if a first-rate finish is desired. Before the first coat of new paint on old work, it is advisable to touch up with red lead and allow it to harden thoroughly. The quality of the paint used is important, and the lighter colours, or those which will carry a good body of white lead, are preferable: genuine old white lead and best linseed oil. Three thin coats are better than two heavy ones, if blisters are to be avoided.

Subject. IV.—The Arrangement and Construction of Buildings in Relation to Health, Drainage, Water Supply, Ventilation, Lighting and Heating.

[*Time of examination, two hours. Maximum number of marks, 75.*]

1. The plan (marked A) is the basement floor plan of a detached London mansion. The basement floor is 11ft. below the level of outside ground, and the distance to main sewer is indicated on plan, as are the positions of the w.c.'s, baths, and sinks, &c. Show by single lines the soil and rainwater drains and pipes, manholes, gulleys, &c., figuring the sizes of the pipes and manholes.

In answering this question the candidate is expected to make certain assumptions, as it would be impossible in the scope of an examination question to give sufficient information. In the answer given it is assumed for instance that (a) there is ample fall to the invert of sewer; (b) that there is sufficient space (the house being detached) to allow the drains to be kept entirely, or almost entirely, outside the house; (c) that it would be advantageous to store the rainwater for washing purposes—involving the use of a "separator," so that the water may be fairly free from soot, &c.; (d) that there is a sewer for stormwater distinct from the one indicated, but near to it; (e) the roof plan was not shown and position of downpipes not indicated—these are assumed; (f) stoneware drains are shown everywhere, encased in concrete where the drain passes beneath the floor of the house: iron drains could have been employed if preferred; (g) position of fence assumed.

2. Draw to ½-in. scale a section through a manhole in the area on north side and an elevation of the soil, waste, vent and other pipes at that point, figuring the dimensions and describing the material.

This question is sufficiently answered by the illustration. The candidate might add short "specification" notes on the quality required in the various materials indicated, as time permitted.

3. Draw to ½-in. scale what, in your opinion, is the best form of (a) valve closet, (b) wash-down closet, (c) grease-trap. Give the makers' names and brief description in each case.

In answering this question each candidate would probably mention the special forms affected in his own office, and it is unnecessary, therefore, to do more than indicate the lines on which the answer would be made. Nearly every patented form has some special feature, such, for instance, as a deep water-seal, a restricted outlet to increase the velocity of discharge, a special formation of the flushing rim, extra strength in the diaphragms which form the trap, self-cleansing formation of the bowl of the trap, different angles of inlet, special methods of jointing: these would be mentioned in describing the reasons for adopting any particular form. The illustrations show sections of a well-known example of each.

4. What steps would you take to cure dry rot in the floors of a warehouse where the floors are of the usual wood, iron and concrete constructions?

The question is not put as clearly as it might be, and in such a case it is as well to state clearly the reading the candidate has adopted. It will be sufficient for all purposes if we assume that the dry rot has attacked three floors of the warehouse of various construction, one (a) being of ordinary wood joists and boarding, one (b) of concrete on the solid ground laid with wood blocks, and one (c) an upper iron joist and coke-breeze concrete floor boarded direct. In all cases of dry rot it is impossible "to cure" the diseased wood itself; this must all be carefully removed and the surrounding, apparently unaffected, wood treated with creosote or other disinfectant. The next step will be to find out the causes leading to the decay, and to take special precautions to prevent its recurrence. The disease is usually in the wood before fixing, but the germs are sometimes produced and always encouraged by a damp and unventilated situation. In the case of (a) it would be probably found that the space beneath the floor had not been thoroughly ventilated by air-bricks, or possibly there was no concrete over the area below, nor any damp-course below the wood plate in both sleeper and main walls; or, supposing it is an upper floor, perhaps the rot first attacked the built-in and unventilated ends of the binders or girders and spread from these to the rest of the floor timbers. It would therefore be necessary in reconstructing the floor to see that these points were specially attended to. In the case of (b) it would probably be found that there was no proper layer of pitch between blocks and concrete, or, if in a damp situation, no horizontal damp-course either in, above or directly below the concrete to prevent ground or flood water rising; or it might be caused by the flooding of the floor from external doors, windows or areas, or even by careless swilling down of the floors; these would therefore be the points to consider and remedy in relaying the floor. In the third case (c) the rot was probably in the wood before it was laid, and was stimulated by either being laid before the concrete was thoroughly dry or by being covered (perhaps in the office) by linoleum, or even by damp sacks or similar goods not frequently moved. In any case removal of all diseased wood and the treatment of the sound wood and the concrete, etc., surrounding the diseased portion with disinfectant, and care that the precautions against the recurrence of the conditions causing the disease, would generally effectually prevent its further spread. But the thorough removal of all signs of disease, not only from the wood, but from the walls, floors and spaces below is absolutely of the first importance: sunlight and, where possible, abundant movement of air in every corner is the surest preventative of its occurrence in the first instance and will even do much to prevent its development in sappy wood having a special tendency to the disease.

5. State what you know about the regulations of public authorities as to (a) Open spaces at the rear of buildings, (b) Internal areas, (c) W.c.'s above and below ground level.

The answer to this question would to some extent depend on the locality in which the candidate has gained his experience: he must have a good working experience of either the London Building Act or the Model By-laws. Assuming the former, we notice first of all as to (a) that the stringency of the regulations is greater in the case where the building is in a new street: the minimum superficial area of the open space in the rear of such buildings, provided they are used for purposes of habitation, being respectively 150 sq. ft. and 100 sq. ft. in those laid out before and after the commencement of the Act. The Act proceeds to specify the minimum width to be that of the building, and the minimum depth to be 10ft. (with allowances for certain outbuildings not exceeding 9ft. in height), the minimum angle from back fence (63½ deg.) to be unobstructed by building; but these are modified in the case of old streets by raising the level to the height of 16ft. where the lowest floor is not constructed for habitation, &c. Exceptions to the normal are then provided for, as, for instance, corner sites and sites adjoining the river or public open spaces. Special rules govern dwelling-houses adapted to be inhabited by the working classes. As to (b) internal areas or courts within a building, when enclosed on all sides, and the height above ground-floor ceiling exceeds the greater cross measurement on plan, provision to be made for ventilation between lower end of court and outer air. Windows of habitable rooms in such areas to be at a distance from opposite wall equal to at least half the height from its sill to top of parapet. As to (c), references to the Model By-laws, or those made by the L.C.C. under the Public Health Act, show the following to be the principal regulations :—

1. One wall to be an external wall.
2. One wall to contain a window at least 2ft. by 1ft in the clear, and opening direct to external air (it is generally provided in addition that at least half of it may be opened, and the opening to extend to top of window).
3. In addition to window, a permanent ventilator, such as an air-brick, is required.
4. Separate cistern for flushing to be provided, disconnected from drinking water supply.
5. Form of basin and trap regulated.
6. Above ground level the regulations ensuring a proper soil pipe and adequate ventilation of drain would apply, and might be given by the candidate.
7. Not to be approached directly from any habitable room, &c.
8. No "container" or D-trap allowed.

6. *What is the best aspect for a dwelling-house, and why? What measures should be taken in damp, low-lying districts to ensure the sanitary conditions of the building?*

Speaking generally, the south-east is probably the best aspect for the principal rooms of a house, but regard should always be had to the purpose of each room and the part of the day in which it is likely to be used. A house should be so situated with respect to the points of the compass as to receive the sun in every room at some time of the day—hence the objection to a due south or north aspect. Exceptions to the general rule are often made where certain winds prevail, or by the seaside, or where a certain view or prospect forms an important feature.

In damp, low-lying districts the following would be the most important points requiring consideration :—

1. Drainage of sub-soil by agricultural pipes for a considerable area around building, to keep the ground water at least 2ft. from the surface when possible.

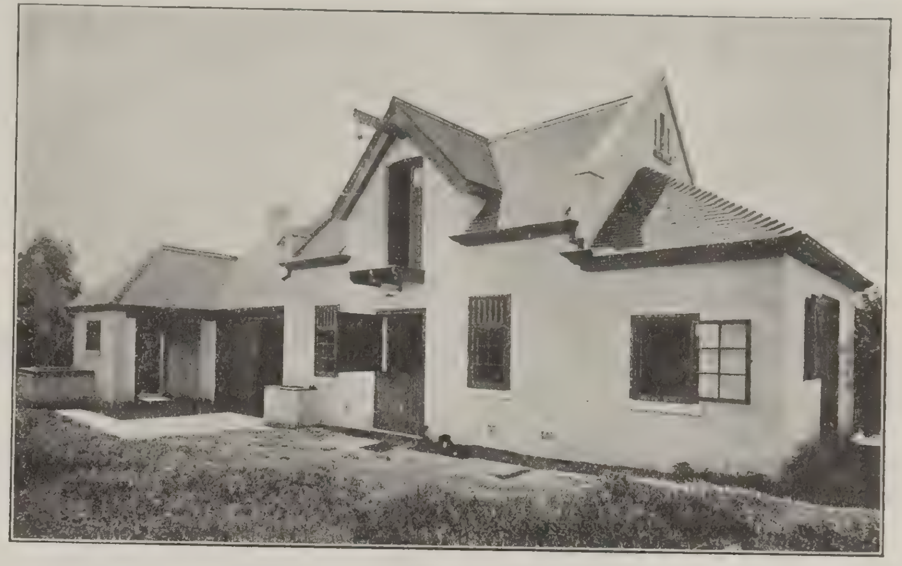
2. Plantations of such trees as are found to evaporate the greatest amount of moisture.

3. Avoidance of the use of a basement or any parts for habitation below the highest water level in the soil (sometimes, when floods occur, the damp-course, and consequently the ground floor, must be lifted considerably).

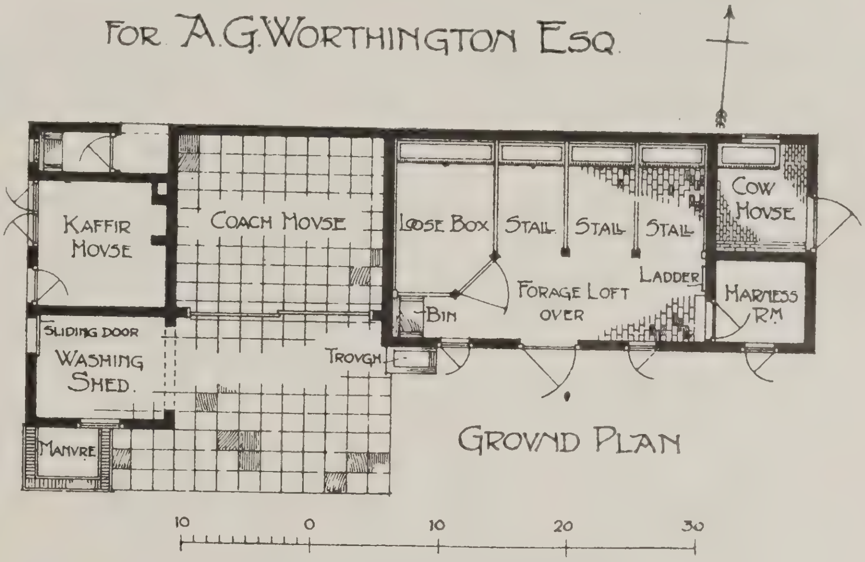
4. Careful attention to the concreting of the actual site and sometimes of a certain area in addition all round the building.

5. The use of the least-absorptive materials in the construction of the house.

6. A thoroughly good damp-course to all main and sleeper walls, and due regard to ventilation under floors. Where basements are unavoidable it is best to provide dry areas or at least vertical damp-proof courses.



STABLING AT PRETORIA FOR A.G. WORTHINGTON ESQ.



FREDERICK CHATTERTON, A.R.I.B.A., ARCHITECT.

THE SHEFFIELD SOCIETY.

Mr. E. Holmes, in his presidential address to the Sheffield Society of Architects and Surveyors last week, remarked that negotiations were now proceeding with the university authorities which he hoped would result in all future ordinary and general meetings being held in the new university buildings. A complete scheme for the education of architects and surveyors had been formulated by the Council and approved in general meetings, and was now only waiting the sanction of the university authorities. He had very little doubt that in a very short time the scheme would be in full working order.

He related the progress which had been made by the Council of the Society in their negotiations with the City Council with respect to the proposed new by-laws, which had tended to simplify them and render them more workable and practicable.

Amongst other subjects which had the attention of the Council he mentioned the question of compulsory registration of architects and surveyors, exhibition of model cottages, congress of architects, &c. He expressed the belief that the new road undertaken by the Corporation through the Rivelin Valley would prove a success both artistically and commercially. Speaking of the large number of vacant sites which are now in the possession of the Corporation, he suggested to the members of the Society that they might usefully turn their attention to the solution of how to deal with these vacant sites. Mr. Holmes also dealt with a number of other general subjects, such as the housing problem and local taxation.

Our Plates

New Premises, Pall Mall, S.W.

These premises, immediately opposite Marlborough House, are now being erected for the London and Lancashire Fire Insurance Co. The site was an extremely difficult one to deal with, as the public passage, Crown Court, runs through the centre of the building, dividing it into two narrow strips; and the opening to this court had to be made to suit the requirements of the County Council, irrespective of its effect upon the elevation. The building is faced with Portland stone, and the roof is of green-glazed Normandy tiles. The upper part will be let as chambers for bachelors. The builder is Mr. James Carmichael, of Wandsworth, and the architect is Mr. E. Guy Dawber, F.R.I.B.A.

Enquiries Answered.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional, or legal matters.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Articles.

HIBERNIAN writes: "I have been with an architect in the capacity of pupil for three years, but had only a verbal agreement with him; no proper articles were drawn up between us. How could the matter be put on a proper footing, and would a deed drawn up now be legal? If so, should I pay any fee, or would an affidavit, stating the facts of the case, be sufficient evidence of my training?" My principal is willing to assist me in the matter."

An actual deed is not necessary to make articles of pupilage legal. I suggest that the case will be met by a formal certificate from the principal to the effect that the pupil had been with him in the position of an articled pupil from such a date to such a date, that the term of pupilage is now complete, and that the pupil had duly fulfilled all the conditions and obligations of that position. F. S. I.

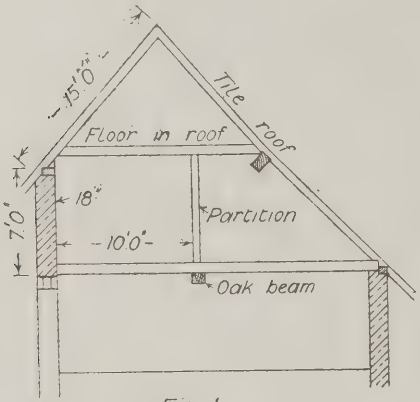


Fig 1

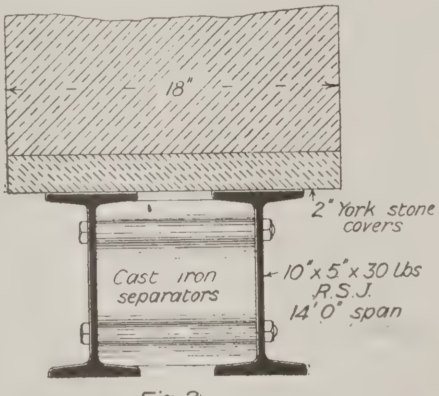


Fig. 2

STEEL JOISTS TO CARRY WALL.

Estate Agency.

HUDDERSFIELD.—ESTATE AGENT writes: "Which are the best examinations and qualifications for a land and estate agent? Also, which is the best weekly paper dealing with such work?"

The examinations of the Surveyors' Institution and the degree F.S.I. are, in our opinion, the best qualifications for a land and estate agent. As regards the best weekly paper on this subject it would be invidious to draw comparisons, and we advise you to obtain copies of the following and judge for yourself:—"Estates Gazette," "Estates Journal," "Land Agents' Record," and the "Estate World."

Fungus in Floor.

JARROW.—FLOORS writes: "I have received orders to repair several floors in a certain street. The houses were built about 30 years ago. About 10 years ago extra ventilators were put in, with holes in the middle walls to allow a current of air to pass from back to front. Recently a floor was pulled up and found to be in a wretched state. The under part of the flooring seemed to have a damp appearance, but the joists were covered with fungus, and bunches of it were hanging to the underside of the flooring. Even the skirting boards on the back were covered with it, and the boards fell to pieces when touched. Can you suggest a cure?"

You should increase the supply of air, and also coat the underside of the woodwork with creosote.

R.I.B.A. Testimonies of Study.

WALES.—CYMRO writes: "Is it permitted by the R.I.B.A. to draw as a testimony of study the Order from the monument of Lysicrates, as if the building were rectangular?"

We should say yes; although it would be better to draw any Order from existing remains as it actually is or was, in the correct relation for which it was designed. For further particulars, however, we would advise you to apply to the Secretary of the Royal Institute of British Architects.

Inspection Chambers.

CONSTANT READER writes: "It is intended to construct a roof over a yard. In this yard is an inspection chamber connected with a w.c. The surveyor says we must remove the chamber into the open air, as it is deemed an inlet to the drain within the meaning of the following by-law:—'A person who shall erect a new building shall not construct any drain of such building in such a manner as to allow any inlet to such drain [except such inlet as may be necessary from the apparatus of any water closet] to be made within such building.' (1) Is the chamber an inlet to the drain? (2) In any case is the surveyor's contention correct?"

We think that the surveyor's interpretation is quite correct, and also that the contention was quite legitimate. It is certainly injurious to have an escape of sewer air into a covered yard, where air is more or less stagnant.

Fire Insurance.

LONDON.—FIRE INSURANCE writes: "Is there any book published at a reasonable price which you can recommend to enable me as a fire insurance student to secure a knowledge of building construction? So far, the FIRE SUPPLEMENT of your journal is all I can find to help me."

We should advise you to get Dobson's "Art of Building" and "Specification" No. 9, price 2s. and 3s. 3d. respectively, post free from our offices.

Illicit Commissions.

CLERK OF WORKS writes: "A friend of mine has had premises built under the superintendence of the architect, usual terms. It has now come to his knowledge that the architect has received large sums of money from the different firms supplying materials, also from the builder, sums being provided for far in excess of their value. My friend has given the architect notice, dispensing with his services, and would like me to complete the work for him. The architect has had the ordering of nearly all the materials. In discharging him, how is the contract affected with the builder, who has paid him sums of money, and another contractor who has a separate contract for the shop-fitting? Which is the best way to proceed with the object of getting the work finished?"

Presuming what you say can be established as true, the architect has been guilty of a breach of trust. It might be possible to proceed against the contractors for the recovery of the money paid to the architect in the way of secret commission, and we have little doubt that you could secure damages against the architect. We advise the client to place the matter in the hands of a solicitor.

Steel Joists or Flitch Girder.

ERIQUE writes: "What size rolled steel joist would be sufficient to carry over an opening of 14ft. span a wall 7ft. high and 18ins. thick, old flint, with one window opening (3ft. by 5ft.) 2ft. from one end deducted? The wall carries an old Sussex tiled roof and floor. The rolled steel joist would also have to carry floor joists and weight of ceiling. Also, if a built-up wood bressummer were used with a $\frac{1}{2}$-in. flitch-plate bolted, what size would be required? Also, another opening as above, only 9-ft. span. Please show working out."

The working of this case (of which Fig. 1 shows the section) will be as follows:—Weight from wall $= 1{\cdot}5\ (14 \times 7 - 3 \times 5) \times 160$lbs. = 20,000lbs. = say 180cwts.; weight from roof $= (14 \times 5 \times 1) = 70$cwts.; weight from first floor $= (14 \times 5 \times 1) = 70$cwts.; weight from floor in roof $= (14 \times 5 \times 1) = 70$cwts.: making a total of 390cwts. = say 20 tons. Referring to a catalogue it will be seen that two (B.S.B. 17) 10″ × 5″ × 30lbs. joists will be sufficient, as shown in Fig. 2. For a flitched beam to do the same work, say three 14″ × 6″ beams with two $\frac{5}{8}$″ flitches. Breaking weight in cwts. in centre $= \frac{d^2}{L}(cb + 30t) = \frac{14^2}{14}(3{\cdot}5 \times 3 \times 6 + 2 \times 30 \times \frac{5}{8})$ $= 14\ (63 + 37{\cdot}5) = 14\ (100{\cdot}5) = 1{,}407$cwts. Allow a factor of safety of 6, then safe load $= \frac{1407 \times 2 \text{ for distrib.}}{20\text{cwts. in 1 ton} \times 6} = 23{\cdot}4$ tons safe load. The 9-ft. span may be worked in the same way, the load being $\frac{9}{14}$ of the above load, say 13 tons. HENRY ADAMS.

Royal Sanitary Institute: City and Guilds.

BRADFORD.—P. writes: "Please give name of book that would enable me to pass the examination of the Royal Sanitary Institute, or any set of questions for the same. Are the City and Guilds' questions in building construction published?"

Apply to the Secretary of the Royal Sanitary Institute, Parkes Museum, Margaret Street, W. The questions are given in the annual report of the City and Guilds of London Institute, published by Mr. John Murray, Albemarle Street, W., price 9d.

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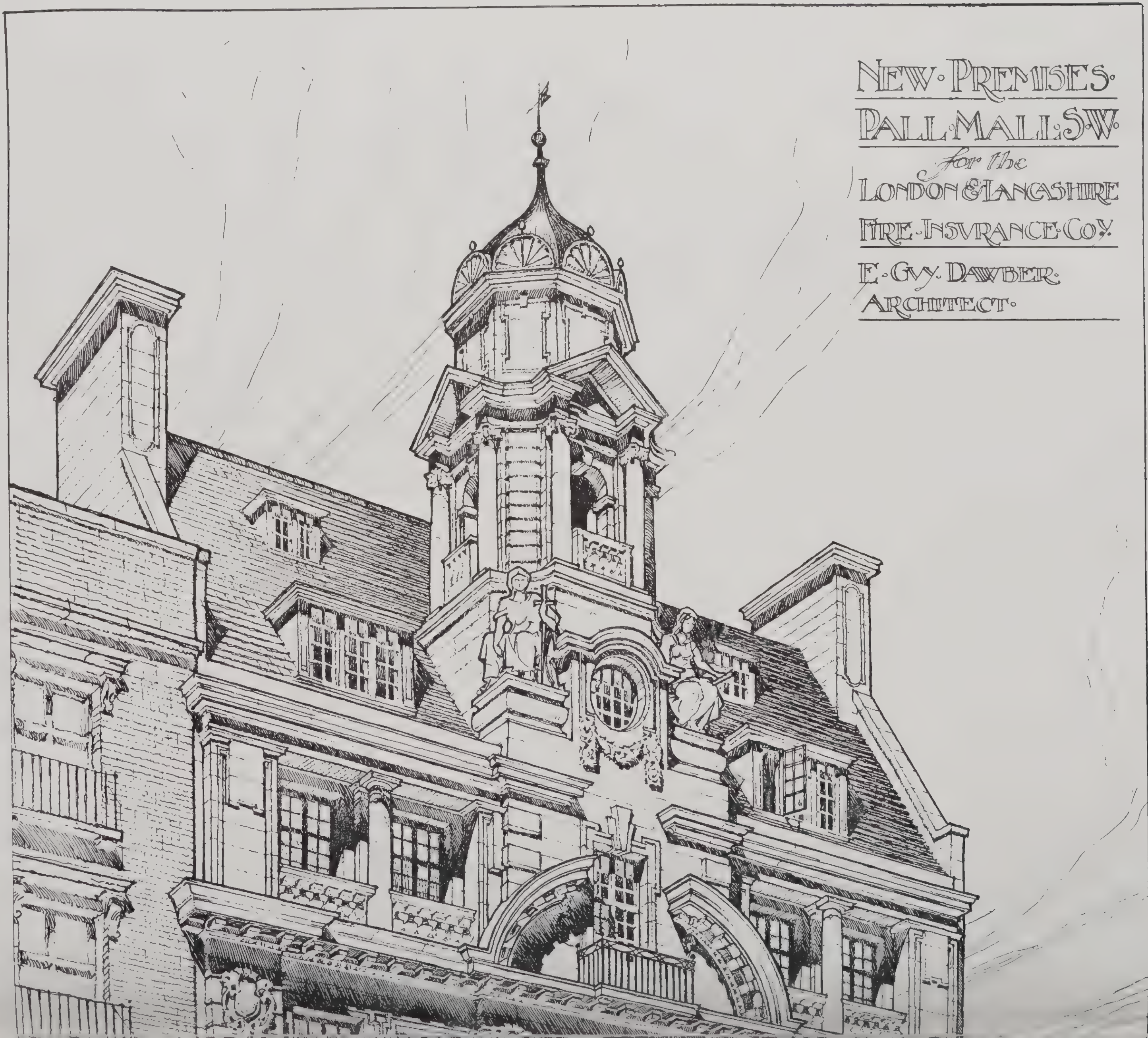
Supplement to
The Builders' Journal and Architectural Engineer,
Wednesday October 17th, 1906.



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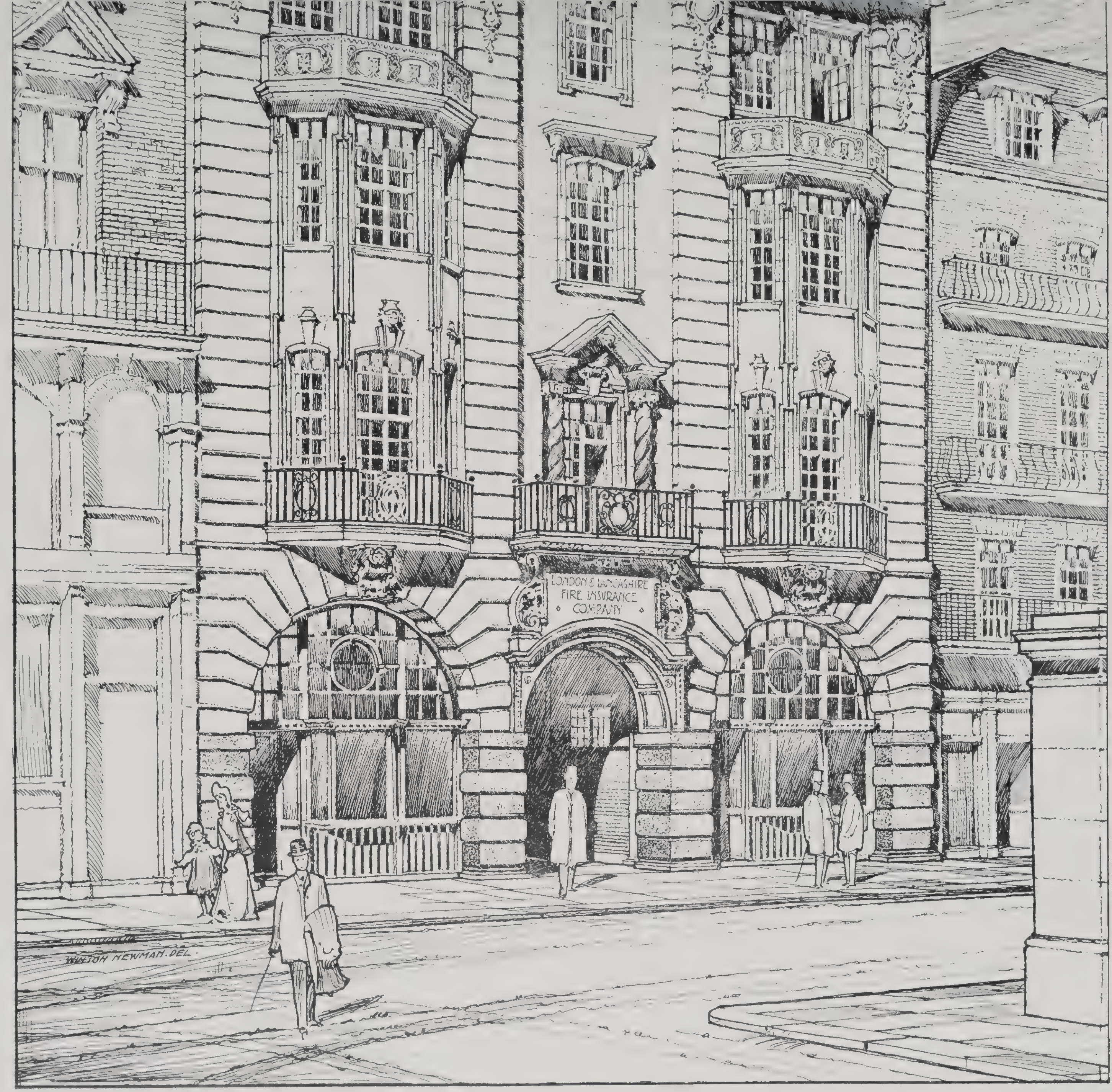
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New London Buildings

At last week's meeting of the London County Council the Building Act Committee reported the following applications under the London Building Act, 1894, their recommendations as to consent or refusal being appended in *italics*:

Formation of new streets for carriage traffic out of the east side of Erpingham Road and north side of Clarendon Road, Putney, so far as relates to the abandonment of the formation of the street proposed to be known as "Brickworth Street," and an alteration of the position, at its eastern end, of the street proposed to be known as "Landford Road," on the application of Lee and Pain-Clark. (*Consent.*)

One-storey buildings at the rear of seven shops on the eastern side of Garratt Lane, Wandsworth, northward of St. Andrew's Church, and in connection therewith the formation of a street, on the application of L. S. Rogers on behalf of J. and R. Heard. (*Refusal.*)

Re-erection of "The Three Jolly Gardeners" public-house, upon the site of No. 103, Union Street, and No. 31, Great Guilford Street, Southwark, on the application of F. J. Eedle and Meyers, on behalf of Truman, Hanbury, Buxton & Co., Limited. (*Consent.*)

Buildings on the southern side of High Street, Clapham, on the application of J. Donkin, on behalf of the trustees of the Foster estate. (*Consent.*)

Nine houses with shops on the western side of Askew Road, Hammersmith, northward of "The Sun" public-house, on the application of F. J. Brewer, on behalf of A. Gard. (*Consent.*)

Two studio buildings on the southern side of Logan Place, Kensington, on the application of G. H. Jenkins, on behalf of Professor G. Moira and F. L. Jenkins. (*Consent.*)

Addition in front of West Lodge, Blackheath, on the application of G. F. Havell, on behalf of Mrs. Penn. (*Consent.*)

Retention of projecting wooden reflectors at the premises of Waring and Gillow, Ltd., Winsley Street, Oxford Street, on the application of R. F. Atkinson, on behalf of Waring and Gillow, Ltd. (*Consent.*)

Projecting balcony and bay-window in front of No. 10, Maddox Street, W., on the application of Lander, Bedells and Crompton, on behalf of T. Coles. (*Consent.*)

Stone porch in front of No. 34, Hill Street, Berkeley Square, on the application of Brown and Barrow, on behalf of Col. Sackville West. (*Consent.*)

Projecting porch and two balconies in front of proposed buildings on the site of Nos. 344 to 354, Gray's Inn Road, St. Pancras, on the application of L. V. Hunt, on behalf of the Welsbach Incandescent Gas Light Co., Ltd. (*Consent.*)

Retention of a projecting clock in front of No. 48, Regent Street, Strand, on the application of R. H. Kerr, on behalf of Mellins, Ltd. (*Consent.*)

Buildings on the eastern side of Garratt Lane, Wandsworth, with flanks abutting also upon Waldron Road and Freshford Street, on the application of Holloway Brothers. (*Consent.*)

Eight houses with bay-windows on the east side of Upper Clapton Road, Hackney, between No. 174, Upper Clapton Road and Moresby Road on the application of G. H. Paine, on behalf of Jordain and Paine. (*Consent.*)

Three blocks of flats on the western side of Church Path, Stoke Newington, with projecting porches and four storey bay-windows, on the application of J. H. May, on behalf of J. M. Pritchard. (*Consent.*)

Projecting stone porch in front of a house on the eastern side of Old Oak Road, Shepherd's Bush, on the application of R. Norman-Hewitt, on behalf of the Rev. T. B. Monti. (*Consent.*)

Extension of a passageway across the rear of the third shop from the northward, in connection with the erection of nine houses with shops on the western side of Askew Road, Hammersmith, and the erection of a bakehouse abutting upon such extension at the rear of the second shop from the northward, on the application of J. J. Kelf. (*Consent.*)

Oriel window and balcony in front of a proposed block of buildings on the southern side of High Holborn, opposite New Oxford Street and partly on the site of Nos. 193 and 194, High Holborn, on the application of Warwick and Hall, on behalf of the Holborn Metropolitan Borough Council. (*Consent.*)

New shop front at No. 12 New Oxford Street, Holborn, on the application of Lee, Dickins & Co., on behalf of H. Hunt. (*Consent.*)

Building on the north-western side of Elthorne Road, Holloway, to abut also upon Boothby Road, on the application of G. Lethbridge, on behalf of the managers of the Highgate Presbyterian Church. (*Consent.*)

Projecting porch at the flank of No. 50, Carholme Road. Lewisham, to abut upon Marler Road, on the application of Norfolk and Prior, on behalf of G. A. Summers, (*Consent.*)

Two porches in front of a proposed block of buildings between Nos. 18 and 20, Cavendish Square, St. Marylebone, on the application of Gilbert and Constanduros. (*Consent.*)

Retention of an iron and glass covered way at the entrance to No. 3, Douro Place, Victoria Road, Kensington, on the application of Miss F. A. Lee. (*Consent.*)

Six houses with projecting one-storey shops on the northern side of Landor Road, Brixton, abutting also upon Atherfold Street, on the application of V. Vagnolini, on behalf of W. P. Goosey. (*Consent.*)

Retention of a detached greenhouse at the rear of No. 1, Bolingbroke Grove, Clapham, to abut upon Nightingale Lane, on the application of Dr. R. R W. Oram. (*Consent.*)

Buildings on a site abutting upon a new street to lead out of Ebury Street and also upon Grosvenor Gardens Mews North, Pimlico, on the application of A. F. Faulkner, on behalf of W. Willett. (*Consent.*)

Oriel window at No. 20, Warwick Street, Strand, on the application of J. N. R. Vining, on behalf of Liberty & Co. (*Consent.*)

Three houses on the site of Nos. 11 to 14, Hobart Place, W., on the application of Boehmer & Gibbs, on behalf of G. Trollope & Sons and Colls & Sons, Ltd. (*Consent.*)

Bay-windows and porches to houses on the north and south sides of Eatonville Road, and east side of Trinity Road, Tooting, on the application of W. C. Poole, on behalf of F. Eaton. (*Consent.*)

Three blocks of buildings on the eastern side and two blocks of buildings on the western side of Derinton Road, Totterdown Fields estate (section "C"), Tooting, on the application of R. Robertson, on behalf of the Housing of the Working Classes Committee of the Council. (*Consent.*)

Retention of one-storey shops at Nos. 36, 38, 40 and 42, Lower Richmond Road, Putney, on the application of W. West, on behalf of C. D. Collins. (*Consent.*)

Porches to two houses on the north side of Baldry Gardens, Streatham, on the application of W. J. James, on behalf of Wooding & Cole. (*Consent.*)

Retention of a projecting pilaster at the flank of a house in Upper Tooting Road, Wandsworth, abutting on the western side of Stapleton Road, and erection of shops on the southern side of Tooting Bec Road, on the application of Taylor, Willcocks & Co., on behalf of A. T. Wellings. (*Consent.*)

Shops on the eastern side of Balham Hill, Wandsworth, abutting upon Hazelbourne Road, on the application of P. Meredith. (*Consent.*)

Three shops upon the site of "Old Oak Villa," Uxbridge, Hammersmith, on the application of W. G. Ingram, on behalf of Griggs Brothers. (*Refusal.*)

Iron and glass covered way in front of No. 20, Lansdowne Road, Holland Park, Kensington, on the application of G. H. Fox, on behalf of T. Pocklington. (*Refusal.*)

Buildings on the eastern side of Muirkirk Road, Catford, to abut upon Dowanhill Road, on the application of R. Stewart, on behalf of A. Cameron-Corbett. (*Refusal.*)

Block of shops, with a concert hall over, upon the site of St. Paul's Church, Great Portland Street, St. Marylebone, on the application of Joseph and Smithem, on behalf of Perry Brothers. (*Refusal.*)

Wrought-iron arch on the forecourt of Nos. 168 and 170, Edgware Road, on the application of C. Hall, on behalf of E. S. Burns (*Refusal.*)

Workshop building at the flank of No. 59, Ashmore Road, Paddington, to abut upon Lydford Road, on the application of A. Hall, on behalf of W. H. G. Balchin. (*Refusal.*)

One-storey shop in front of No. 68, Richmond Road, Paddington, on the application of Barnett and Brotchie, on behalf of J. Snowman. (*Refusal.*)

Urinal at the rear of "The Nightingale" tavern, Nightingale Lane, Clapham, on the application of W. West, on behalf of T. Wallis. (*Consent.*)

Building on the site of No. 8, Allen Street, Goswell Road, Finsbury, on the application of E. B. I'Anson. (*Consent.*)

Building on the site of No. 16, Felton Street, Hyde Road, Hoxton, on the application of G. H. Lovegrove, on behalf of E. T. Pearce. (*Consent.*)

Billiard-room and lavatory addition at the rear of No. 32, Brompton Square. Kensington, on the application of Hubbard & Moore, on behalf of A. Simpson. (*Consent.*)

Boundary wall at the rear of No. 3, Bolton Gardens, Old Brompton Road, Kensington, on the application of W. Cave, on behalf of I. Walker. (*Consent.*)

Addition to the Durning Mission Hall, on the southern side of Elsa Street, Limehouse, on the application of A. S. Taylor, on behalf of Sir E. Durning-Lawrence, Bart. (*Consent.*)

Two water-closet buildings in the area of No. 13, Cambridge Place, Paddington, abutting upon Market Street, on the application of W. H. Smith, on behalf of the Humber Co., Ltd. (*Consent.*)

Latrines at the Wade Street (Roman Catholic) schools, Poplar, on the application of R. L. Curtis, on behalf of the managers of the schools. (*Consent.*)

Houses on the eastern side of Johnson Street, St. George-in-the-East, northward of St. Mary's Hall, on the application of Calnan and Son. (*Consent.*)

Building on the northern side of King Street, Camden Town, to abut upon Little Camden Street, on the application of S. G. Castleman, on behalf of Maple & Co., Ltd. (*Consent.*)

Building on the site of Nos. 195, 197, 199 and 201, Union Street, Southwark, on the application of H. Jarvis & Son, on behalf of Hayward Bros. and Eckstein, Ltd. (*Consent.*)

Building at the rear of No. 184, Camberwell Grove, Dulwich, to abut upon Stories Road and a roadway leading therefrom, on the application of A. Laycock. (*Refusal.*)

Buildings on the southern side of Narrow Street, westward of No. 108, on the application of J. M. Knight. (*Refusal.*)

Wooden fence at the rear of No. 279, Kingsland Road, Haggerston, and retention of wooden timber stage at the rear of the said premises, on the application of Wagstaff and Sons, on behalf of T. Jeffreys. (*Consent*).

One-storey wood and iron shed, at the eastern side of Dewar Street, Peckham, on the application of F. Webster and Son, on behalf of R. W. Atkinson. (*Refusal.*)

Iron and glass conservatory on the rear portion of the roof of the Bath Club, so far as relates to the erection of an iron and concrete enclosure to the gearing of an electric lift adjoining the said conservatory, on the application of C. Johnson, on behalf of the Directors of the Bath Club Company. (*Consent*)

Stable buildings on south-eastern side of Valentine Place, Southwark, on the application of W. Egerton, on behalf of the Maltina Co. (*Consent.*)

Oriel window at No. 3, Little Putney Street, Soho, Strand, on the application of J. P. Briggs, on behalf of Moss Vernon, (*Refusal*)

Building upon the site of Nos. 51 and 51A, Strutton Ground, Westminster, on the application of Glasier and Son. (*Consent.*)

Warehouse building on the south side of Layton's Buildings, Borough High Street, Bermondsey, on the application of Bailey and Wood, on behalf of Sissons Brothers & Co., Ltd. (*Refusal.*)

Addition to No. 74, Southgate Road, Hackney, on the application of Spiers & Son. (*Consent.*)

House on the northern side of Springrice Road, Hither Green Lane, Lewisham, on the application of J. Stanford, (*Refusal.*)

Formation of a new street for carriage traffic, to lead from Nightingale Lane to Temperley Road, Wandsworth, on the application of R. L. Freeman. (*Consent.*)

Formation of two new streets for carriage traffic upon the St. Quintin estate, on the western side of St. Helen's Garden's, Kensington, on the application of Trant, Brown and Humphreys, on behalf of W. H. St. Quintin. (*Consent.*)

Formation of new streets for carriage traffic on the Fairfield House Estate, Tooting, to lead from Mitcham Road to Totterdown Street, on the application of W. C. Poole, on behalf of Ayre and Kingcome. (*Consent.*)

Formation of a new street for carriage traffic, to lead from Fulham Palace Road to Colehill Lane, Fulham, on the application of A. Blackford. (*Refusal.*)

Formation of new streets for carriage traffic, to lead out of the western end and southern side of Chartfield Avenue, Putney, on the application of J. C. Radford, on behalf of Lord Westbury. (*Refusal.*)

Building, at Victoria Works on a site on the western side of Victoria Road, Old Charlton, to exceed 250,000, but not 450,000 cubic feet, and to be used only for the purposes of the manufacture of copper wire cables, on the application of Scott, Hanson and Fraser, on behalf of Johnson & Phillips, Ltd. (*Consent.*)

Addition to premises on northern side of Ashwin Street, Dalston, to exceed in height the width of the street, on the application of F. T. W. Goldsmith, on behalf of Reeves & Son. (*Consent.*)

Conversion of one-storey stable building on the north side of The Grove, Eltham, into a two-storey dwelling-house, on the application of C. A. Chapman, on behalf of F. Hare. (*Refusal.*)

At yesterday's meeting the following applications were reported :—

One storey addition at No. 21, Cumberland Mews, Regent's Park, at less than the prescribed distance from the centre of the roadway of the street. (*Rescission of resolution*; *refusal.*)

Buildings with projecting shop fronts, &c., on the site of Nos. 418 to 421, Strand, on condition *inter alia* that no vault, arch, cellar or other construction be made in or under the land. (*Rescission of resolution*; *refusal.*)

Projecting shop fronts in front of No. 63, High Street, Putney, on the application of A. Sykes, on behalf of Lilley & Skinner, Ltd. (*Consent.*)

Projecting one-storey shop in front of No. 131, Victoria Street, Westminster, and a projecting one-storey shop at the rear, to abut upon Ashley Place, so far as relates to the erection of projecting pilasters in front of the shop abutting upon Ashley Place, on the application of W. Woodward. (*Consent.*)

One-storey shops in front of Nos. 289 to 303 (odd numbers only) inclusive, Streatham High Road, Streatham, on the application of A. E. Chasemore, on behalf of G. W. Elvin. (*Refusal*).

Buildings on the southern side of Melrose Road, Southfields, eastward of Avenue Road, on the application of A. W. Taylor & Co., on behalf of A. Duff. (*Refusal.*)

Buildings on the western side of Bolton Mews, Kensington, at the rear of No. 6, "The Boltons," and at less than the prescribed distance from the centre of the roadway of Bolton Mews, on the application of A. C. Forrester, on behalf of S. V. Morgan. (*Consent.*)

Six houses on the site of "The Mount," Thurlow Park Road, Norwood, on the further application of G. Herbert. (*Consent.*)

Buildings with projecting shop fronts, bay windows and balconies upon the site of Nos. 418 to 421, Strand, to abut upon the Strand and Exchange Court, on the application of Crickmay & Sons. (*Consent.*)

Buildings on the northern side of South Row and western side of West Row, Kensal Town, on the application of E. W. Fagg, on behalf of J. Stockwell. (*Consent*).

Two iron and glass shelters at the Broadway Theatre, Deptford, to abut upon New Cross Road and Tanner's Hill, on the application of Vaughan, Brown & Cook, on behalf of D. Allen & Sons. (*Consent.*)

Projecting one-storey shops in front of Nos. 49 and 51, Queen's Road, Dalston, on the further application of Young Bros. (*Consent.*)

Twelve houses, with porches, on the western side of Hither Green Lane, Lewisham, on the application of Norfolk & Prior, on behalf of W. Rolfe. (*Consent.*)

Two dwelling-houses on low-lying land situated in Elmington Road, Camberwell, on the application of W. M. Proudfoot, on the behalf of S. F. Cope. (*Consent.*)

The Theatres and Music Halls Committee also reported the following :—

Drawing submitted by W. G. R. Sprague, showing certain additional means of ventilation which it is proposed to instal in the auditorium of the Aldwych Theatre, Kingsway. (*Consent.*)

Drawings submitted by H. Lewis of the Fawcett Liberal Club in Blechynden Street, North Kensington. (*Consent.*)

Drawings submitted by W. J. Ancell, showing a proposal to rebuild Challis's Royal Hotel. (*Consent.*)

Drawing submitted by T. H. Hiscott of the Colonnade Restaurant, Nos. 161A and 166, Strand. (*Consent.*)

Drawings submitted by E. W. Mountford of a building to be erected at Stockwell Green and to be known as Hammerton Hall. (*Consent.*)

Drawing submitted by J. M. Klempner of the Imperial Restaurant, No. 20, Shepherd's Bush Green. (*Refusal.*)

Drawings submitted by Wylson & Long, showing certain alterations proposed to be made to the seating at the London Pavilion Music Hall, Piccadilly. (*Consent.*)

Drawings submitted by F. W. Hingston of the Loughborough Hotel, Brixton. (*Consent.*)

Drawings submitted by A. C. Kent of Odone's Restaurant, No. 152 Victoria Street. (*Consent.*)

Drawing submitted by E. Runtz & Ford, showing how it is proposed to provide additional sanitary accommodation at the Pavilion Theatre, Mile End. (*Consent.*)

Drawings submitted by W. Woodward of the Piccadilly Hotel, Piccadilly. (*Consent.*)

Drawings submitted by F. Matcham & Co., on behalf of Moss' Empires, Ltd., showing the arrangements proposed to be adopted in the erection of a music-hall, to be known as the Finsbury Park Empire, on a site at the junction of St. Thomas's Road and Prah Road, Finsbury Park. *(Consent.)*

Drawing submitted by J. Jeffreys, showing an iron and glass roof proposed to be erected over the Barford Street Goods Yard at the Royal Agricultural Hall, Islington. *(Consent.)*

Drawings submitted by E. Hide & Son of the proposed St. Saviour's Parish Hall, Brockley Rise. *(Consent.)*

Drawings submitted by A. B. Jackson, showing certain alterations which it is desired to make at the Savoy Theatre, Strand, with a view to obtaining an entrance from Savoy Court. *(Consent.)*

Drawing submitted by H. and G. Taylor, showing certain small structural alterations proposed to be executed at Sportsbank Hall, Sportsbank Street, Catford. *(Consent.)*

Drawings submitted by A. Marshall Mackenzie & Son, showing the arrangements of the basement and ground floor of the Waldorf Hotel, which is in course of erection in Aldwych. *(Consent.)*

Drawings submitted by the Aberdeen Electrical Engineering Company, Limited, showing the arrangements in connection with the electric lighting installation which it is proposed to provide in the large public rooms on the basement and ground floors of the Waldorf Hotel. *(Consent.)*

Notes and News

The London County Council Architect's Department employs more than 200 assistants.

Theatre Alterations.— Messrs. Patman & Fotheringham, Ltd., have secured the contract for extensive alterations at the Savoy Theatre.

A New School at Old Kilpatrick, costing £19,400, has been erected from designs by Mr. D. Andrew, of Glasgow. It accommodates 1,420 pupils.

Aldershot Parish Church is to be enlarged, the old parts of the building being preserved as a south aisle. The architect is Mr. T. G. Jackson, R.A.

A Prize for Furniture.—Messrs. Waring have been awarded a Grand Prix and Gold Medal for high class furniture and decorative work at the Milan Exhibition.

Additions to the Royal Victoria Hospital, Craigleith, Edinburgh, are to be carried out. The architects for the work are Messrs. Sydney Mitchell & Wilson, of Edinburgh.

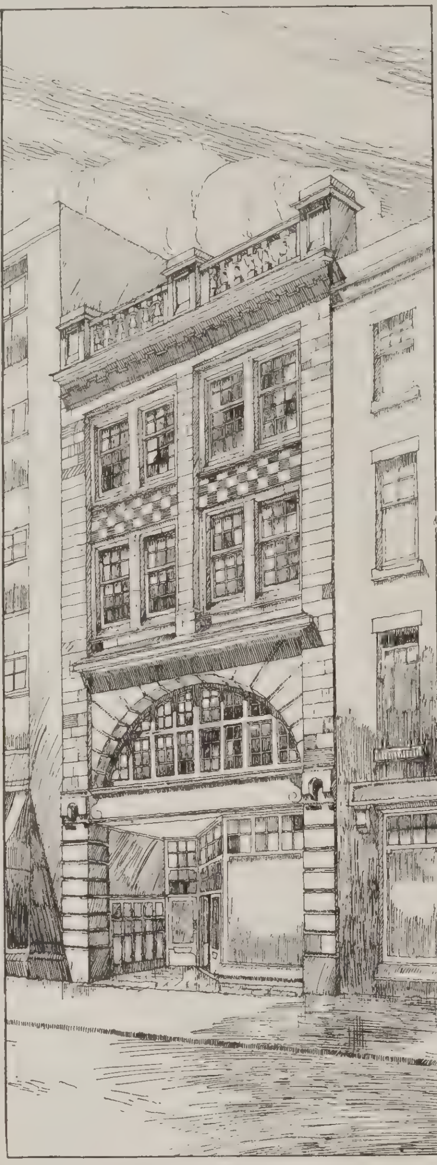
At the Milan Exhibition two gold medals, two silver collaborateur medals and one bronze medal were awarded to Messrs. Simplex Conduits, Ltd., for their exhibits.

New Union Offices at Lanchester were opened last week. Messrs. Newcombe & Newcombe, of Newcastle, were the architects, and Mr. J. Robson, of Waterhouses, was the contractor.

An Architect Mayor.—Mr. F. W. Dixon has accepted the invitation to the Mayoralty of Southport for the coming year. Mr. Dixon is an architect in business in Manchester and Southport.

The Society of Arts has just published its programme for the 1907 examinations. This gives full details about the whole scheme, with much information useful to intending candidates and a reprint of all the papers set this year.

At the Girls' High School, Truro, a new wing for laboratories and technical instruction is being added. The architect is Mr. E. R. Robson, of Westminster, and the builder Mr. John Colliver, of Truro. Like the original building, the walls will be of Plymouth limestone, with dressings of Cornish granite.



BUSINESS PREMISES, WINNIPEG.
INGALL, SON AND MITTON, ARCHITECTS.

The ground floor of these premises is devoted to an artist's store and picture gallery, the first and second floors to offices, and the top floor to a photographic studio, &c. The front is intended to be executed in local stone, relieved by tile or brick bands. The architects are Messrs. Ingall, Son & Mitton, of Birmingham and Truro.

The North Library of the Islington Borough Council, Manor Gardens, Holloway Road, was opened recently by the Mayor of Islington. Mr. H. T. Hare was the architect, and Patman & Fotheringham, Ltd., were the contractors.

Gold Medal for Sir William Richmond.—The Council of the Institute of British Decorators has awarded its first gold medal to Sir W. B. Richmond, K.C.B., R.A., in consideration of his important decorative work in St. Paul's Cathedral. It has been arranged to have a public presentation at Painters' Hall on Monday, November 26th.

Glastonbury Abbey for Sale.—The ruins of Glastonbury Abbey are shortly to be offered for sale. In connection with them there is the customary rumour that an offer of purchase has been received from America. The hope is expressed that, following the precedent of Tintern, the Government should acquire the ruins as a national possession.

An Amalgamation has taken place between the Birmingham Guild of Handicraft, Ltd., and Gittins Craftsmen, Ltd., who will in future carry on the joint businesses under the name of the former company at 45, Great Charles Street, Birmingham, and at 7, Newman Street, Oxford Street, London, W. The company retains the services of the directors, designers and principal craftsmen of both the amalgamated firms.

Messrs. Mellowes & Co., Ltd., of Corporation Street, Sheffield, have secured the order for glazing on their "Eclipse" patent imperishable system the roofs of extensions to works of Messrs. Thornycroft & Co., at Woolston; the Premier Cycle Co., Ltd., Coventry; F. W. Cotterill, Ltd., Darlaston; Richardson, Westgarth & Co., West Hartlepool; Hawthorn, Leslie & Co., Newcastle-on-Tyne; also export orders for Holland, South Africa and Denmark.

The Inspectorship of Ancient Monuments.—If the Government should decide, in accordance with the wishes of the Congress of Archæological Societies, to make an appointment to the vacant Inspectorship of Ancient Monuments, it might be well for them to increase the scope of the officer's duties, says the "Evening Standard and St. James's Gazette." He might be instructed to keep an eye not only on ancient monuments and historic remains, but on the statues of the living present, and on the niches where statues should be but are not.

Another Garden City.—An agreement has been arrived at between the Garden City Association and the owners of the Alkrington Hall estate, which is within 14½ miles of the Manchester Exchange, and about the same distance from Oldham, whereby the association obtains an option of purchase. The site is an excellent one, and comprises between 700 and 1,000 acres of good land about 400ft. above the sea level. It is proposed to develop it on the same lines as the Garden City at Letchworth. A company is to be formed to complete the purchase, and it is expected that part of the land will be taken possession of by the Manchester Tenants, Ltd.

Obituary

Mr. James MacIntosh, the well-known art decorator, by whom the decorations of the Royal Mausoleum at Frogmore and other important buildings were carried out, died last week, aged 60 years.

New Companies.

J. EDMONDSON & SON, builders, contractors, &c., Winchmore Hill, Muswell Hill, Sydenham Road and Woodford. Capital: £45,300.

LITTLER CONCRETE CO., to take over the business of artificial stone manufacturers carried on by G. W. Littler and S. Littler, at Runcorn. Capital: £6,000.

JOHN ADAMS & CO. (Leicester), to take over the business of builders' merchants, slaters, tilers, and coal merchants carried on by J. Adams, at St. George's Gate and Omberstone Road, Leicester. Capital: £3,000.

JOSEPH H. PEARSON, LTD., to acquire the business of ironmasters, &c., carried on by A. Pearson, R. T. Pearson and E. Y. Pearson at Park House Colliery, Staffs, as Joseph H. Pearson, and to carry on the same and the business of colliery proprietors, coke and brick manufacturers, miners, &c. Capital: £30,000.

Notes on Competitions

The period of summer vacations and official inactivity having drawn to a close a few faint signs of life are manifesting themselves in the world of competitions. The evidences do not, so far, bear witness to a healthy awakening, and can only prove disappointing to the army of combatants who, refreshed by enforced abstemiousness, are now waiting, fully equipped, eager for the fray. That there are some who will accept the few challenges that have been sent and who will enter the lists regardless of the insufficient rewards offered for those appointed to receive them, by judges lacking the necessary qualifications, is, unfortunately, a contingent which the past has made but too certain. That the majority will stand off and reserve its efforts for a fairer field or until such time—if it arrives—as the present challenges shall have been modified is, happily, a contingent that can also be relied upon.

Until recently it was possible to classify defects in conditions of competitions under certain recognised headings. This year a new fault has had to be dealt with, one which has been referred to in these columns as an attempt, on the part of promoters, to lay a competition open to the lowest bidder, by a request that competitors would state the terms they would require for their services, if successful. Such was the case at Barnsley, where competitors for a school were selected from applicants who were required to state the amount of commission they would be prepared to accept. Acting, no doubt, upon numerous representations, Barnsley eventually announced that the usual remuneration would be paid, and so the trouble passed, leaving the hope that, by its rareness, it would not be met with again. Now it has broken out in two new places in conjunction with the recurring complaint of "no assessor," and, as might have been anticipated, the subjects are libraries.

Carnegie Public Library at Earlestown, Lancashire.

The promoters are the Newton-in-Makerfield Urban District Council. In the announcement of the competition it is required that architects shall "state their inclusive terms for the preparation of all necessary plans, specifications, bills of quantities, both as regards the library itself and the permanent fittings, and for superintending the work during construction." The cost of the library, including permanent fittings, furniture, &c., and architects' inclusive charges, is not to exceed £4,000. The conditions—if they can be so called—are in the form of a one-sheet letter signed by the Clerk to the Council. They contain no mention of an assessor, nor of how, and by whom, the designs will be selected. Enquiries have been made of the Town Clerk as follows:—"1. Will a professional assessor be appointed, and, if not, who will judge the designs? 2. Will the assessors be influenced by the lowness of the terms quoted by any competitors for the preparation of drawings, &c.? If so, the best design might be disqualified if it were accompanied by the author's quotation upon recognised scale rates. In a building of this size and nature the ordinary recognised scale of charges is little enough." The Town Clerk has replied:—"Although nothing has been mentioned as to the appointment of an assessor to judge the designs, the committee will doubtless call in one. As regards the terms I cannot state more than is mentioned in the advertisement." This is a very diplomatic reply. As it has been made to an intending competitor it must be regarded as final. The lack of definite information as to assessing ought, therefore, by the prudent, to be interpreted as "no professional assessor," and the question of fees, viewed similarly, ought to be taken to mean "success to the lowest bidder."

Free Library, Treharris, Merthyr Tydfil.

This case is almost identical with the former. There are absolutely no conditions beyond the information contained in the announcement of the competition. Here the expenditure is given as not to exceed £1,750, presumably inclusive of fees, but not so stated, and "Competitors are requested to state their terms for preparation of the necessary contract plans and detailed drawings, specification, bills of quantity and architect's supervision during erection." It is also stated to whom and by what date the designs are to be submitted, but whether they are to be accompanied by a report in a sealed envelope, or are to be marked with a nom-de-plume or motto, or signed by their authors, is apparently left to the competitors' judgment. An application for conditions was productive of a block plan, without figured dimensions, to a scale of 44ft. to the inch, and of a half sheet of paper, startling in the brevity of its wording, "Treharris Free Library. Accommodation. Reading Room. Lending Library. Caretaker's Room. Reference Room. Ladies' Reading Room and Lavatory. Gentlemen's Lavatory and Conveniences in Basement." In reply to enquiries similar to those made of the Town Clerk of Earlestown, the borough engineer of Merthyr Tydvil has written, "The advertisement and the particulars already sent convey all the information I have. The Corporation have not, so far as I know, gone into the question of an assessor." The same interpretation must therefore be put upon these matters as in those of the preceding case.

New School, Gaywood, Norfolk.

There have been so many applicants for conditions of this competition that the promoters have limited it to architects whose offices are situated in Norfolk. Designs are to be sent in by October 22nd.

The New County Hall.

In an interview which a "Tribune" representative had with Prof. Beresford Pite last week we notice some references to the new County Council Hall, and the competition which is to be held for the design. Prof. Pite is reported as having said: "The site at the south end of Westminster Bridge is almost an ideal one for the purpose. It will induce a long, comparatively low building, stretching along the river much as the Houses of Parliament do—and, we may hope, will provide us with as interesting and beautiful a building. This site provides an opportunity for British architects, the like of which they have not had for a long while. If architects were numerous enough for their votes to count, the absurd proposal that foreigners should compete for the design would already have been eliminated from the Council's programme. Whether the County Hall is to be an improvement or a blot is, of course, a most serious matter, and the action of the County Council seems to imply a fear on their part that English architects alone would not be able to supply a worthy building. In all aspects of building, where freedom and traditional association are of account, English architecture is confessedly more full of life and vigour than that of the Continent. We do not want those elements to be absent from the new County Hall. With Somerset House, the Houses of Parliament, the Adelphi, and New Scotland Yard on one side of the river—all the work of British architects—it will be very strange if it proves necessary to employ a foreign architect to design London's own municipal hall on the other."

"The Architectural Review" Alphabet Competition.

The designs submitted in this competition are to be exhibited at the premises of the Architectural Association from Saturday, November 17th, to Saturday, November 24th. Admission on Saturdays from 10 to 4; on other days from 10 to 6.

Proposed new Town Hall for Dundee.

Speaking at a meeting at Dundee last week, the Lord Provost said that the public had shown that it wished a new town hall to be erected, and he expressed the desire that a competition for the building should be held among Dundee architects.

Rebuilding of Henshaw's Blind Asylum, Manchester.

The awards in this competition, which is limited to Manchester architects, will, we understand, be made known in December. The assessor is Mr. John Holden, F.R.I.B.A.

Dublin Technical Schools.

Architects in Dublin have presented a memorial to the Irish Institute urging that a deputation be appointed to wait on the Dublin Corporation with the object of securing a local competition for the design of the new technical schools.

Workmen's Houses, Tranent, Midlothian.

The competition for these houses, which are to be erected for the Co-operative Society, has resulted in the selection of the design by Mr. Edward C. H. Maidman, architect, of Edinburgh. The estimated cost of the work is £2,046.

List of Competitions Open.

DATE OF DELIVERY	COMPETITION.
Oct. 20	SEWERAGE SCHEME FOR HIGHBRIDGE, Somerset. Premium £20. Particulars from W. C. Shier, Surveyor to the U.D.C., Highbridge.
Oct. 22	SCHOOL AT GAYWOOD, King's Lynn. Particulars from Secretary, County Education Office, 57, London Street, Norwich.
Oct. 31	BOURSE AT CAIRO.—Premiums of £E250 and £E100. International competition. Designs to be submitted to the "Corporation des Agents de Change," Cairo, Egypt.
Nov. 30	LIBRARY AT NEWTON-IN-MAKERFIELD.—Cost £4,000. Particulars from C. Cole, clerk to U.D.C., Town Hall, Earlestown, Lancs.
Dec. 14	FOUNDLING HOSPITAL, MONTEVIDEO.—Four selected designs in preliminary competition to be awarded £212 each; first premium of £742 in final competition. Particulars from Consulate-General for Uruguay, 5 & 6, Clement's Inn, London, W.C.
No date	NEW COUNTY HALL, LONDON. Particulars from G. L. Gomme, clerk, L.C.C., Spring Gardens, S.W.

DEVELOPMENT OF LIVERPOOL

Presidential Address to the Liverpool Architectural Society.

Mr. Edmund Kirby, F.R.I.B.A., in his presidential address last week to the Liverpool Architectural Society, said that nearly twenty years ago that Society honoured him by electing him president. Having briefly alluded to the Society's position in the old days, he dealt with the developments which had since taken place in the improvement of the classical style of architecture, and the influence of Mr. Norman Shaw's work in this direction. The result in the present day had been the erection of many fine buildings in London and the provinces. Among the latter one of the first examples of the classical style on a large scale in Liverpool was the stately building and the costly offices erected by the Royal Insurance Co. There were also the fine buildings, approaching completion, of the new Cotton Exchange and the new offices of the Mersey Dock Board. As regards the two large vacant sites at the George's Dock, the northern one of which had lately been sold by the Corporation for the erection of new offices, whilst it was reported that the larger vacant space between it and the Dock offices was also to be purchased for building purposes, Mr. Kirby said it was to be hoped that the best architectural efforts would be put forward by the purchasers and the new owners in the development of these schemes to render them worthy of such sites, rare in a great commercial centre, with unique advantages for architectural display, with practically unlimited light and air, and great open spaces on every side in which to enjoy the beauties of the buildings they might suround. The opportunity was thus presented of achieving at what might be called the "gate of the city" an effect of architecture which, when completed, and in conjunction with the Dock offices already erected, would command a frontage to the noble river worthy of rivalling that presented by the quays of Venice. He did not know what control, if any, of the plans and elevations had been reserved by the Corporation of Liverpool over the erection of any schemes that might be put forward for the adjoining sites, but he would point out that in similar cases of choice of sites in London the Council of the Royal Institute of British Architects had for several years been asked to advise the Government and also the London County Council upon the designs of new buildings and the laying out of important new routes and street developments before erections thereon were permitted to be begun. He felt confident that the Council of the Liverpool Architectural Society had men in its body to whom the City Council could, similarly to London, refer such questions of design, and with the same excellent results.

In the last 20 years changes had been so numerous in Castle Street that it might be said to be nearly rebuilt. With the Town Hall as the end of the vista of view looking north, he knew no commercial street, even in the city of London, comparable with it for appropriate and complete architectural effect. Having referred to the erection in an up-to-date style of branch banks, free libraries and schools, the great tobacco warehouse, the grain warehouses at the south end, and the new Corporation small-pox hospital at Fazarkerley, which from the reports on all sides seemed to be the best hospital in the country, Mr. Kirby said he rejoiced that the new Cathedral was rapidly being pushed on, and its progress would be watched with the keenest interest in the development of its fine and original design. The International Congress of Architects, held in London in July last, discussed municipal work and the housing of the working classes. Liverpool was sadly backward in this movement. Some drastic orders were in progress for the sweeping away of some of the worst dwellings of the poor. Whatever was done, he trusted that cottage houses (preferably with small gardens) might be adopted in preference to the "flat" system, the cottage houses being more wholesome and healthier than high-"flatted" houses.

Trade and Craft.

Fastening Corrugated Iron Sheets.

There is an old proverb that says "Take care of the pence and the pounds will take care of themselves." The same idea applies in many ways to construction. The small common things are often of supreme importance, and yet we are all inclined to pay little heed to them. The fastening of corrugated sheets is a case in point. We have had to wait for Mr. Frank G. Price, of Calcutta, to offer a satisfactory solution of the problems entailed. In India, as in all our Colonies, galvanized corrugated sheets are more extensively used than in this country. Mr. Price must have been far more struck than architects and engineers in this country by the short life of galvanised corrugated sheets. It is usual, indeed, to tar or paint such coverings every few years, but whereas one would have supposed that this would have indefinitely prolonged their life as long as painting was continued, it is only effective up to a certain point, because the decay takes place where the paint does not penetrate—namely, at the bolt-holes, which never seem to be water-tight, although they may be puttied. The fault is with the washer commonly employed. It is obvious that when a flat washer is put upon a curved surface moisture can get under. The very place where the sheet is least able to resist corrosion is thus exposed most, because the galvanising has been removed by punching the hole for the bolt, and damaged in all probability in its immediate neighbourhood. The solution of the trouble which Mr. Price offers is a very simple one—namely, a cup-shaped washer to which is given the suggestive name of "the Limpet." The little domed discs, shown in section in Fig. 2, possess the property of altering their original shape when screwed down to a corrugation, and of assuming a somewhat elliptical form with a true and perfect bearing on the surface to which they are applied. The "Limpet" washers adapt themselves to any position, not only on the top of a corrugation, but also in the hollow. The ordinary system of fastening sheets is clearly compared with the new in Fig. 1.

As will be seen in the detail view (Fig. 2.), the washers are provided with a lip or rim round the hole, which, besides being an advantage where ordinary bolts are used, is a special feature in connection with Price's "Limpet" bolts, which are made with a corresponding groove under the head so as to engage this lip or rim (as shown in Fig. 2). No putty or red lead is required, and the "Limpet" washers completely protect a considerable area of the sheet round the hole—just what is required.

Another advantage in the "Limpet" is that it acts as a locking washer, and prevents any slacking of bolts due to expansion or vibration, for it maintains a continual tendency to spring back to its original shape. Extreme changes of temperature have been found to exercise a very prejudicial effect on corrugated iron roofing, and this further feature in the washer will serve to reduce the racking strain thus caused.

The "Limpet" washers are at present made in three types, as follows :—

Type No. 1 is formed of No. 22 B.W.G. mild steel; the diameter of the washer is $1\frac{1}{4}$ins., and the height of the concave is $\frac{3}{8}$in., with a lip or rim $\frac{1}{32}$in. high round the hole upwards. This type is made in two sizes—one to pass $\frac{3}{8}$-in. bolts, and another to pass $\frac{1}{4}$-in. bolts, and is intended for use with hook bolts and other main connections.

Type No. 2 is formed of No. 24 B.W.G. mild steel; the diameter of the washer is $1\frac{1}{8}$ins., and the height of the concave is $\frac{5}{16}$in., with a lip or rim $\frac{1}{32}$in. high round the hole upwards. It will pass $\frac{1}{4}$-in. bolts, and is intended for seam joints in the sheets.

Type No. 3 is formed of thin metal, about 28 B.W.G.: the diameter of the washer is 1in., and the height of the concave is $\frac{1}{4}$in., with a lip or rim $\frac{1}{16}$in. high round the hole upwards. It will pass $\frac{3}{8}$-in. bolts, and is intended for use under wind ties, the method adopted where these are employed being to place one washer between the sheet and the wind-tie, and one above the latter. The lower washer, being of thin metal, collapses when the bolt is screwed home.

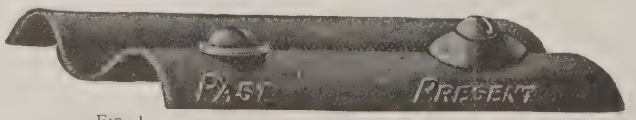


Fig. 1.

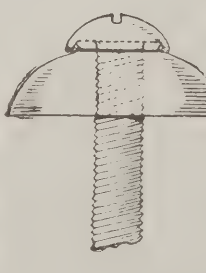


Fig. 2.
THE "LIMPET" WASHER, BOLT AND DRIVE-SCREW.

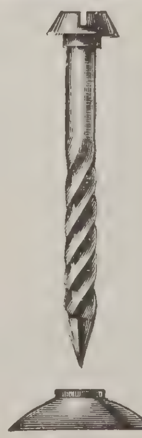


Fig. 3.

The washers are equally well adapted for holding down by screws in wooden frame buildings. As, however, the ordinary roofing screws require considerable time and labour in use, an improved drive screw for use with these washers has also been placed upon the market. Its form is as shown in Fig. 3. It is driven like a nail and has the holding power of a screw, with the advantage of not requiring boring. These drive screws are supplied in the following sizes:—2in., $2\frac{1}{4}$in., $2\frac{1}{2}$in., $2\frac{3}{4}$in., & 3in. by No. 14.

We refer at this length to these small commodities because they are obviously of very great importance, and there is no doubt in our mind that they ought to be regularly specified where iron sheeting is used. Messrs. William Jacks & Co., of 5, East India Avenue, London, are the patentee's sole managing agents, but the articles can be obtained through any wholesale or retail ironmonger.

Complete List of Contracts Open.

WITH a few exceptions, news of Contracts Open are not repeated after they have been published once in these columns, so that **readers will find particulars in our previous issues of other contracts that still remain open.**

Unless expressly stated to the contrary, all deposits required for bills of quantities, &c., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair-wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

Oct. 18. Fenton.—*Erection of public underground conveniences.* Persons desirous of tendering are requested to send in their names to S. A. Goodall, surveyor to the Council, Town Hall, Fenton. The tenders are to be delivered not later than Oct. 18.

Oct. 18. Belfast.—*Additions to premises in Montgomery Street* and Gloucester Street, Belfast, for J. Robson, Limited, according to the plans and specification, which may be seen of V. Craig, F.R.I.B.A., architect, 22, Donegall Place. Bills of quantities may be had from S. C. Hunter, Scottish Provident Buildings. Tenders to be lodged with V. Craig not later than 10 a.m. on Oct. 18.

Oct. 19. London, S.E.—*Erection of public library* at the junction of the Old and New Kent Roads in accordance with the plans and specifications of C. Batley, A.R.I.B.A. The plans and specifications may be inspected at the Town Clerk's Office, Town Hall, Walworth Road, any day between the hours of 10 a m. and 5 p.m., except Saturday. Persons desirous of tendering must forward their names to J. A. Johnson, town clerk, Town Hall, Walworth Road, S.E., together with a list of buildings of a similar character erected by them, not later than Oct. 19, at noon.

Oct. 22. Glasgow.—*Construction of offices* for Carron Company contract, on the tongue at Grangemouth Docks, for the directors of the Caledonian Railway Co. The drawings may be seen at the office of the company's engineer, Buchanan Street, Glasgow, where copies of the specification and schedule may be obtained on payment of £2 2s. Sealed tenders, endorsed "Tender for Construction of Offices for Carron Company at Grangemouth Docks," to be lodged with J. Blackburn, secretary, Caledonian Railway Co.'s Offices, 302, Buchanan Street, Glasgow, on or before Oct. 22.

Oct. 23. Salford.—*Removal of existing buildings* and the erection of a recreation-room at the rear of the Branch Library in Greengate, Salford. Drawings may be seen, forms of tender and combined specification and bill of quantities obtained at the Borough Engineer's Office, Town Hall, Salford. Tenders, endorsed "Recreation-room, Greengate," addressed to the Chairman of the Museum Committee, must be delivered to L. C. Evans, town clerk, Town Hall, Salford, not later than 4 p.m., Oct. 23.

Oct. 23. London, E.—*Erection of an additional furnace* in connection with the dust-screening apparatus at Marian-square, for the Metropolitan Borough of Bethnal Green. Plans and specification can be seen, and form of tender obtained, upon applicatipn to the Borough Engineer and Surveyor, at the Town Hall, Church Row, Bethnal Green, between the hours of 10 a.m. and 4 p.m. Fair wages clauses. Tenders. sealed, and endorsed "Furnace," must be delivered to R. Voss, town clerk, Town Hall, Bethnal Green, E., not later than 12 noon on Oct. 23.

Oct. 23. Selby.—*Erection of cottage, office, and boundary wall,* at the New Waterworks, Brayton Barff, Selby, for the U.D.C. The drawings and specifications can be seen at the offices of Percy Griffith, M.Inst.C.E., engineer, 54, Parliament Street, Westminster, S.W., and Bruce McG. Gray, A.M.Inst.C.E., engineer, Council Offices, Selby, and forms of tender and bill of quantities may be obtained on payment of a deposit of £1 1s Sealed tenders endorsed "Cottage, etc.," to be delivered to J. H. Bantoft, clerk to the Council, Council Offices, Selby, not later than 12 noon on Oct. 23.

Oct. 24. St. Helens.—*Additions to Cowley Middle Schools,* Cowley Hill Lane, St. Helens, for the County Borough Council. On deposit of the sum of £1 1s., plans and specifications may be inspected and bills of quantities and conditions of contract obtained at the offices of Frank S. Biram, architect, Hardshaw Street, St. Helens. Sealed tenders, endorsed "Tender for Additions to Cowley Schools," must be delivered to W. H. Andrew, town clerk, Town Hall, St. Helens, Lancashire, not later than 10 a.m. on Oct.-24.

Oct. 24. St. Helens.—*Erection of new schools* at Parr, St. Helens, for the Borough Council. On deposit of the sum of £1 1s., plans and specifications may be inspected and bills of quantities and conditions of contract obtained of F. S. Biram, architect, Hardshaw Street, St. Helens. Sealed tenders, endorsed "Tender for New Schools, Parr," must be delivered to W. H. Andrew, town clerk, Town Hall, St. Helens, Lancashire, on Oct. 24.

Oct. 24. Wolverhampton.—*Erection of new cart sheds* at the Team Committee's Depot in Crown Street, in accordance with the plans, which may be seen, and specification and bill of quantities to be obtained on application at the office of G. Green, borough engineer, Town Hall, Wolverhampton. Sealed tenders, addressed to the Chairman of the Team Committee, and endorsed "Tender for Sheds," to be delivered at the Town Clerk's Office, Town Hall, not later than 10 a.m. on Oct. 24. Fair wages clause.

Oct. 25. Horsham.—*Extending the cloak-room accommodation* to the boys', girls', and infants' departments, of the Horsham East Parade Council Schools. Plans, specifications and conditions of contracts may be seen, and forms of tender obtained at the offices of C. H. Burstow, architect, No. 6, West Street, Horsham. Tenders, sealed and endorsed "Tender for Extension at East Parade Council Schools," to be addressed and delivered to L. Thompson, secretary, Education Offices, West Street, Horsham, not later than 12 o'clock noon on Oct. 25.

Oct. 25. London, S.W.—*Alteration and extension of the laundry* at the Workhouse, Swanfield Road, Wandsworth, for the Guardians of the Wandsworth Union. Persons desirous of tendering may inspect the drawings and specification, and obtain a copy of the bills of quantities and form of tender between the hours of 10 a.m. and 4 p.m. (Saturdays until 1 p.m.) upon application at the Guardians' Offices, St. John's Hill, Wandsworth, near Clapham Junction Railway Station, and by depositing with F. W. Piper, clerk, £2. Tenders, upon the form supplied must be signed, enclosed in the envelope provided, and delivered to F. W. Piper, clerk, Union Offices, St. John's Hill, Wandsworth, S.W., not later than 10 o'clock a.m. on Oct. 25.

Oct. 26. Colchester.—*Additions to the administration block* at the Infectious Diseases Hospital, Mile End. Plans may be seen and copies of specifications, quantities, &c., obtained on application to H. Goodyear. A.M.I.C.E., borough engineer and surveyor, Borough Engineer's Office, Town Hall. Sealed tenders, endorsed "Additions, Infectious Diseases Hospital," to be delivered to him not later than 10 a.m., Oct. 26.

Oct. 27. Great Burstead.—*Structural alterations and additions* to the Council School, Great Burstead. Plans, specifications, and form of contract may be inspected at the office of F. Whitmore, architect, 73, Duke Street, Chelmsford, between the hours of 10 and 5 o'clock on any working day except Saturday. Builders desirous of tendering must send in their names and addresses to the architect at once, when a copy of bill of quantities will be supplied to each applicant, if references are satisfactory. Any tender accepted must be subject to the approval of the Local Government Board. Sealed tenders, endorsed "Tender for Great Burstead School Alterations," should be sent to F. W. Bittles, clerk, Brentwood, not later than Oct. 27.

Oct. 29. Farnworth.—*Erection of a new public elementary school* in Plodder Lane, Farnworth. Bills of quantities may be obtained on written application to H. Rostron, secretary of education, Education Office, Darley Street, Farnworth, near Bolton, by payment of a deposit of £1 1s. Fair wages clause. Tenders must be delivered before 12 o'clock noon on Oct. 29, sealed and endorsed, to the Secretary.

Oct. 29. Leeds.—*Erection of proposed alterations and additions to works* and offices for Frank Horsell & Co., Ltd., Holbeck, Leeds. Contractors desirous of tendering are requested to forward their names to J. B. Fraser, architect, Leeds. Drawings and specification can be seen and bills of quantities obtained on payment of a deposit of £1. Endorsed tenders to be delivered to the architect before 10 a.m. on Oct. 29.

Oct. 30. Llanrug.—*Erection of a new chapel* adjoining Pontrhythallt Station for the Llanrug C.M. Chapel Committee. Plans and specification to be seen at the secretary's house, Eryri Terrace, Llanrug, to whom sealed and endorsed tenders are to be sent on or before Oct. 30.

Oct. 30. St. Blazey.—*Erection and completion of shops, stores, and other offices* at Station Road, St. Blazey, for the St. Blazey and District Co-operative Society Ltd. Plans, specifications, and general conditions can be seen, and full particulars obtained at the office of F. C. Jury, architect, No. 1, Alma Villas, Tregonissey Road, St. Austell. Tenders, sealed and endorsed "Shops and Stores Tender," must be sent to W. Foster, secretary, St. Blazey and District Co-operative Society, St. Blazey, Par Station, on or before Oct. 30.

Oct. 30. Exeter.—*Erection of new offices* at Exeter (St. David's) station for the Directors of the Great Western Railway. Plans and specification may be seen, and forms of tender and bills of quantities obtained, at the office of the Engineer at Plymouth (North Road) station, between the hours of 10 a.m. and 4 p.m Tenders, addressed to G. K. Mills, secretary, Paddington Station, London, and marked outside "Tender for Offices at Exeter," will be received on or before Oct. 30.

Oct. 30. Timoleague, Co. Cork.—*Erection and completion of a new Parish Church* at Timoleague, County Cork, according to the plans and specifications prepared by M. A. Hennessy, architect, 74, South Mall, Cork. Copies of the plans and specifications and general conditions of contract may be seen daily at the Parochial House, Timoleague, or at the offices of the architect, South Mall, Cork. Copies of the quantities can be had on application to the architect on payment of £3 3s. Sealed tenders to be addressed to Rev. Peter Hill, P.P., Timoleague, on or before Oct. 30.

Oct. 31. Birkenhead.—*Erection and completion of 18 tenement dwellings* on the east side of Egerton Street. Plan, specification, and particulars can be seen and bill of quantities and form of tender obtained on application at the office of C. Brownridge, M.I.C.E., borough engineer and surveyor, upon a deposit of the sum of £3 3s. Fair wages clause. Tenders upon the printed form supplied, sealed and endorsed "Tender for Dwellings, Egerton Street," to be sent to A. Gill, town clerk, Town Hall, Birkenhead, not later than 12 o'clock noon on Oct. 31.

Oct. 31. Rye.—*Erection of new Grammar School,* Rye. Persons desirous of tendering are requested to send their names and addresses to E. J. Cory, High Street, Rye, Sussex, from whom full particulars can be obtained. Tenders must be delivered not later than Oct. 31, to W. Dawes, clerk to Governors, Bank Chambers, Rye.

Oct. 31. London, W.—*Alterations and additions at No. 96, King Street,* Hammersmith. Plans of the intended works may be seen and a copy of the specification, with form of tender, can be obtained on application to H. Mair, M.I.C.E., borough surveyor. Sealed tenders, endorsed "Tenders re No. 96, King Street," to be delivered to H. Thompson, town clerk, Town Hall, Broadway, Hammersmith, W., not later than 6 p.m. on Oct. 31.

Nov. 1. Blawith.—*Alterations and additions to the residence* known as Brown Howe, also to lodge and farm buildings, situate at Blawith, near Greenodd, for Sir Robert A. Hampson. Plans and specifications may be seen on application to the gardener at Brown Howe. Sealed and endorsed tenders to be sent to W L. Mason, F.R.I.B.A., architect, Ambleside, not later than noon on Nov. 1.

Nov. 5. Odiham.—*Alterations* at the Odiham Police Station. Persons desirous of tendering may see plan, specification, and conditions of contract, and obtain bills of quantities and all necessary information at the office of W. J. Taylor, county surveyor, the Castle, Winchester, on and after the 22nd Oct., between the hours of 9 a.m. and 5 p.m. (Saturdays 9 a.m. and 1 p.m.). A deposit of £2 2s. will be required for a copy of the bills of quantities. Deposits must be made by cheque payable to Hants County Council, and crossed "Bank of England," or particulars will not be sent. Tenders, endorsed "Proposed Alterations, Odiham Police Station," are to be delivered to H. Barber, clerk of the County Council, the Castle, Winchester, on or before Nov. 5.

Nov. 5. Dublin.—*Erection of a stationmaster's house* at Sixmilecross Station, for the Directors of the Great Northern Railway Co. (Ireland). Parties wishing to tender for the work can see the drawing and specification at the office of W. H. Mills, engineer-in-chief, Amiens Street, Terminus, Dublin, or copies of them at the office of the District Engineer, Belfast, and forms of tender can be obtained at either of the above-mentioned places on payment of 1s. each. Tenders, made out on the forms supplied by the Company, and endorsed, "Tender for Stationmaster's House," should be delivered to T. Morrison, secretary, Secretary's Office, Amiens Street Terminus, not later than 10 a.m. on Nov. 5.

Nov. 6. Mile End, Essex.—*Foundations of the main building* of the new second asylum, near Colchester, to be erected at Mile End, about 1½ miles north of Colchester main-line railway station. Persons desirous of tendering for the work may see the plans, specification, agreement, &c., at the County Asylum Office, 4, Duke Street, Chelmsford, between the hours of 10 and 4 o'clock (except Saturdays), when they will be on view between 10 and mid-day. Contractors must send in their names and addresses at once to W. P. Gepp, clerk to the Visiting Committee, Chelmsford, with a deposit of a cheque or Bank of England note of £20, when a copy of the quantities will be sent. Security to the amount of £2,000 for the due execution of the work must be given as the committee may require by and at the expense of the contractor. Sealed tenders, endorsed "Tender for Foundations, New Second Asylum, Colchester," to be delivered to W. P. Gepp, at his office, not later than Nov. 6.

No date. Salford.—*Excavators and concrete work* to increase the height of the banks of a reservoir at the Broughton Dye Works, Salford, for the Winterbottom Book Cloth Co., Ltd., Salford. Copy of bills of quantities can be obtained on application to Stephen Kemp, 6, Princess Street Manchester.

No date. Leeds.—*Erection of an additional Class-room* at the Cross Stamford Street Council School. Contractors desirous of tendering for the whole of the works are requested to apply to W S. Braithwaite, Architect, Education Offices, Leeds, when quantities will be forwarded by them.

No date. Conon.—*Rebuilding of Rose Cottage,* Conon. Contractors desirous of tendering for the various works in connection with this are requested to lodge their names with Cameron & Burnett, architects and ordained surveyors, Academy Buildings, Inverness, from whom schedules of quantities and all other information are to be obtained.

No Date. Foyers.—*Erection of proposed block of shops* and dwelling-houses at Foyers for The British Aluminium Company, Ltd. Contractors desirous of tendering for the various works in connection with the above, are requested to lodge their names with Cameron & Burnett, architects and ordained surveyors, Academy Buildings, Inverness, from whom schedules of quantities and all other information are to be obtained.

No date. Kendal. *Pulling down a wing* and alterations and additions at Eller Bank, Kendal, for William Taylor. Esq. There will be a quantity of good building materials, all in new condition, which will become the property of the contractors. Bills of quantities and all particulars on application to S. Shaw, F.R.I.B A., architect.

ENGINEERING.

Oct. 20. Sudbury, Suffolk.—*Supply and fixing of a Cornish boiler* 12ft. in length by 5ft. 6in. diam., suitable for a daily working pressure of 80lb. to the sq. in., fitted with double deadweight safety valve, blow-off cock, stop valve, steam gauge, water gauges and fittings, fusible plug and manhole, damper, frame, two soot doors, cover-plate and bearers for blow-off pit. Present boiler and setting to be removed and allowed for. Specification will be on view at the Union Workhouse, where site can be inspected, between the hours of 9 a.m. and 5 p m., or copies may be obtained from H. C. Canham, Clerk to the Guardians, 68, Friars Street, Sudbury, Suffolk, upon payment of the sum of £1 1s. Tenders to be sent to him on or before noon on Oct. 20.

Oct. 22. Pontypridd.—*Supply, delivery, and putting to work* of about 2,205 yds. of 75 Single Traction Return and Pilot Cable, Paper Insulation, for the U.D.C. Specifications, general conditions, and form of tender may be obtained on application to J. E. Teasdel, A.M.I.E.E., electrical and tramways engineer, upon payment to J. Colenso Jones, clerk to the Council, Municipal Buildings, Pontypridd, of a deposit of £2 2s. Tenders on the prescribed form, sealed, and endorsed "Tender for Cable," must be received by the Clerk to the Council, on or before Oct. 22.

Oct. 23. Italy.—*Supply of electric cable and insulated wire to the Italian Navy*, to the estimated value of 40,000 lire (about £1,600), for the British Vice-Consul at Spezia, E. M. de Garston. Tenders are to be opened at the Royal Arsenals of Spezia and Naples at 11 a.m. on Oct. 23. A deposit of 4,000 lire (about £160) will be required to qualify any tender. The special conditions of contract may be seen at the Ministry of Marine, Rome, at the Directorates-General of the Royal Arsenals at Spezia and Naples, at the Technical Offices of the Navy, Genoa, and at the principal Chambers of Commerce in Italy. Each tender should be made out on Government stamped paper of one lira, which may be obtained from the Italian Consulate-General in London, 44, Finsbury Square, E.C. Local representation is necessary. The Vice-Consul adds that competitors must produce proof that they are genuine manufacturers of electric cables and wires.

Oct. 23. Belgium.—*Construction of further sections of the railway* from Hannut to Huccorgne on the local railways from Hannut to Vinalmont and Burdinne to Huy. The estimated cost of the work is 185,219 fr. (£7,409), and a deposit of 18,000 frs. (£720) is required to qualify any tender. Tenders by registered letter will be received at the offices of the "Société," at 14, Rue de la Science, Brussels, not later than Oct. 23. A copy of the specifications may be obtained on payment of 1 fr. from M. Mahieu, rue du Moulin No, 3, Waremme.

Oct. 23. Manchester.—*Strengthening of Philips Park Road Bridge* over the Ashton Canal. Drawing may be seen and specification, bill of quantities, and form of tender obtained on application to the City Surveyor's Office, Town Hall, Manchester, on payment to the City Treasurer of £2 2s. All cheques or postal orders are to be made payable to the order of "The Corporation of Manchester." Tenders, enclosed in the official envelope and addressed to the Chairman of the Improvement, &c., Committee, to be delivered at the City Surveyor's office not later than 10 a.m. on Oct. 23.

Oct. 24. Portsmouth.—*Repairing two boilers* at the Eastney Pumping Station, in the borough of Portsmouth. The specification may be seen and a form of tender obtained at the Borough Engineer's Office at the Town Hall. The form of tender is to be completely filled in, and sent under cover to reach A. Hellard, town clerk, Town Hall, Portsmouth, not later than 10 a.m. on Oct. 24. Fair wages clause.

Oct. 27. Heckington.—*Sinking and boring an artesian well* to a total depth of 300ft. or thereabouts, at Heckington for the Sleaford R.D.C. Specifications, schedules, and all other information may be obtained at the office of the Engineer and Surveyor to the Council, W. B. Marsden. 74, Southgate, Sleaford, who by appointment will visit the site with contractors. Tenders, endorsed "Tender for Heckington Water Supply," to be addressed to E. Clements clerk to the Council, 74, Southgate, Sleaford, and sent in on or about 6 o'clock p.m. on Oct. 27.

Oct. 29. Beckenham.—*Supply and erection of an induced draught apparatus* in connection with the Electric Light and Destructor Works, for the U.D.C. Plans, particulars and forms of tender, obtained on application to J. A. Angell, surveyor to the District Council, or J. E. Tapper, electrical engineer, on the production of a receipt from the collector (who attends his office daily from 9 to 10 a.m. only, except on Tuesdays, when his hours are from 9 a.m. to 1 p.m.) for a deposit of £1. Tenders duly sealed and endorsed "Tenders for Induced Draught Apparatus," to reach F. Stevens, clerk of the Council, not later than 4 p.m., Oct. 29.

Oct. 29. Linares.—*Lighting by gas or electricity* the town of Linares. Tenders combining these two systems will also be admitted. The number of lights required will be as follows:—700 lights of 30 candle power, 200 lights of 10 candle power, and 4 lights of 500 candle power. The upset price the municipality will pay is 42,000 pesetas annually. Tenders will be received up to Oct. 29, at the Secretaria del Exemo, Ayuntamiento de Linares, as well as at the Direccion de Administracion, Madrid. Further particulars with regard to the conditions attaching to the contract are contained in the *Gaceta* of Sept. 22, which may be seen at the Commercial Intelligence branch of the Board of Trade, 73, Basinghall Street, London, E.C.

Oct. 29. Erith.—*Supply and erection of* the following plant for the U.D.C.:—Contract No. 1—Water storage tank and supports, water purifying and softening plant, steam feed pump and pipework. Contract No. 2—Removal and re-erection in new building of existing condensers and feed pumps, &c., and pipework. Persons are at liberty to tender for one or both contracts, but not for part of one contract. Copies of the specifications with forms of tender, general conditions and plans may be obtained from C. H. Fry, clerk to the Council, Council Offices, Bexley Road, Erith, on depositing the sum of £5. Plans and specifications can be seen, but not obtained, at the offices of Hawtayne & Zeden, consulting engineers to the Council, 9, Queen Street Place, London, E.C. Tenders sealed and marked "Tender for Electricity Supply Works Extensions," to be addressed to C. H. Fry, and delivered on or before 12 o'clock noon, on Oct. 29.

Oct. 30. Norway.—*Supply and erection of about 35 tons of iron bridge work* for the Norwegian Government Commission of Roads and Bridges. Tenders, in sealed envelopes, marked "Anbud paa Jernfagvaerksbro" are to be delivered at "Veidirektorens Kontor, Akers Gade 42lv, Christiania," by midday on Oct. 30. Copies of the general conditions of tender to the Norwegian Government, and the special conditions, form of tender, and specification for the above contract, may be seen at the offices of the Commercial Intelligence Branch of the Board of Trade, 73, Basinghall Street, E.C.

Oct. 31. Pontevedra.—*Supplying electric light* to the town of Pontevedra for a period of 15 years from 12th April, 1908. The upset price the municipality will pay is 20,000 pesetas annually. Tenders will be received up to 11 a.m. on Oct. 31, at the Palacio Municipal, Pontevedra, and at the Direccion General de Administracion Local at Madrid. The *Gaceta* of Sept. 21 contains further information as to the terms of the contract, as well as a copy of the form of tender, which may be seen at the Commercial Intelligence Branch of the Board of Trade, 73, Basinghall Street, London, E.C.

Nov. 5. Portsmouth.—*Supply, provision, erection, setting to work, and maintenance* of electrically-driven centrifugal storm water pumps, with their switchgear and the accessaries of the whole or any of them, to be erected in an underground pumping station to be built on Southsea Common. Specifications and forms of tender may be obtained from the Town Clerk on payment of a sum of £2 2s., and the drawings may be seen and full information supplied upon application at the offices of Bramwell & Harris, 5, Great George Street, Westminster, S.W. Tenders under seal and endorsed "Tender for Works for the Prevention of Storm Water Flooding in the low lying area of Southsea.—Contract No. 1," must be delivered to Hellard, town clerk, Town Hall, Portsmouth, on or before 12 o'clock on Nov. 5.

IRON AND STEEL.

Oct. 19. Chichester.—*Supply of 1,650 yds. of 5-in. cast-iron pipes*, to be supplied in 9ft. lengths, in accordance with specification. Delivery at Chichester Railway Station, L.B. & S.C. Ry. Drawings may be seen, and specification and bill of quantities, and form of tender obtained at the office of F. J. Lobley, A.M.I.C,E., city surveyor, Council House, Chichester. Sealed tenders, endorsed "Tender for Water Mains," must be received by J. W. Loader Cooper, town clerk, Chichester, not later than noon on Oct. 19.

Oct 22. Spain.—*Supply of cast-iron and forged pieces* to the value of 14,000 pesetas, for the use of the Administration of the Quicksilver Mines at Almaden. Tenders will be received, up to October 22, at the Direccion de las Minas de Azogne de Almaden.

Oct. 24. Norway.—*Supply of round rods of rolled steel* ("flussjern") as follows:—

Diameter.	Length.	Number.
(*a*) 150 mm.	5·2 m.	about 80
(*b*) 105 ,, ...	5·0 ,, ...	,, 30
(*c*) 105 ,, ...	5·6 ,, ...	,, 80
(*d*) 105 ,, ...	6·3 ,, ...	,, 10
(*e*) 105 ,, ...	1·6 ,, ...	,, 10

for the Norwegian Government Lighthouse Authorities. Tenders, stating price per 1,000 kilograms, will be received at "Fyrvæsenets Kontor, Wergelandsvei, Christiania," up to mid day on Oct. 24. Copies of the general and special conditions of tender (in Norwegian) may be seen at the offices of the Commercial Intelligence Branch of the Board of Trade, 73, Basinghall Street, London, E.C. Apart from the usual customs duties, a preference of from 10 to 15 per cent. is given to Norwegian manufacturers. In all cases of Norwegian Government contracts it is obligatory that a resident agent should act for tenderers not residing in Norway, and be responsible to the Government, but it is not necessary for the agent to be a Norwegian firm.

PAINTING AND PLUMBING.

Oct. 19. Walton.—*Painting* at Walton Workhouse. Specification to be seen at the Workhouse, Rice Lane, Walton. Tenders to be sent to H. P. Cleaver, union clerk, Union Offices, Brougham Terrace, Liverpool, not later than 9 a.m. on Oct. 19.

Nov. 1. Monkwearmouth.—*Painting* of the Monkwearmouth Car Depot. Specification and form of tender may be obtained on application to the General Manager, at his office, Wheat Sheaf Corner, Monkwearmouth. Tenders in a sealed envelope, endorsed "Tender for Painting Monkwearmouth Car Depot," must be delivered to F. M. Bowey, town clerk, Town Hall, Sunderland, not later than 12 noon on Nov. 1.

ROADS AND CARTAGE.

Oct. 18. Croydon—*Making-up of the following Streets* within the district of the R.D.C.:—Plough Lane (part of), Caithness Road, Quinton Avenue, Edna Road, Grand Drive (part of), Oxford Road, Grosvenor Road, Grosvenor Gardens, Marchmont Road. Avenue Road, Stanley Gardens. Specification and form of tender can be obtained and the plans can be inspected at the office of the Surveyor to the Council, R. M. Chart, F.S.I., the Town Hall, Croydon, on payment of £2. Tenders to be delivered to E. J. Gowen, clerk, Town Hall, Croydon, on or before 12 o'clock noon on Oct. 18.

Oct. 18. Southend-on-Sea.—*Making-up of the following streets:* Surbiton Road (part of), Fernbrook Avenue, Oakleigh Avenue, Brighton Avenue, Beedell Avenue (part of), Fleetwood Avenue (part of), Woodfield Road. Plans, sections, and specifications may be seen and bills of quantities and forms of tender obtained (on deposit of cheque for £1 1s. in respect of each street), upon application to E. J. Elford, M.I.M.E., Borough Surveyor. No tender will be considered unless made on the prescribed form, and there must be a separate tender for each street. Sealed tenders, endorsed with the name of the street and marked "Tender for Private Street Works," to be delivered to W. H. Snow, town clerk, Town Clerk's office, Southend-on-Sea, before 12 o'clock noon on Oct. 18.

Oct. 23. Barking.—*Supply of 500 cubic yards of 2-in. gauge* and 250 cubic yards of 1½in. gauge hand broken Guernsey granite, delivered alongside the Council's Wharf. Barking Creek, for the U.D.C. Full particulars and form of tender can be obtained upon application to C. F. Dawson, surveyor to the Council, Public Offices, Barking. Tenders are to be sent to H. Hargreaves, clerk to the Council, Public Offices, Barking, marked on the outside "Tender for Broken Granite," before 12 o'clock noon on Oct. 23.

Oct. 24, Woodstock.—*Supply of stone* of each or either of the Hartshill, Clee Hill, Leicestershire granite, and Rowley Regis stone, qualities at per ton, for the R.D.C.—viz., Best handpicked unbroken stone; best broken stone, 2 in. gauge, clean and free from chippings; best double-screened nuts for patching purposes, 1½-in. gauge; best double-screened coarse chippings, and best finest chippings and binding chippings. The stone is to be delivered to the Council at the undermentioned wharves, on the Oxford and Birmingham Canal—namely, Aynho, Somerton, Heyford, Enslow, Thrupp Landing, angford Lane, Kidlington Bridge, King's Bridge and Wolvercote; and at the undermentioned railway stations —namely, Aynho, Somerton, Heyford, Bletchington, Handborough, Woodstock, Bloxham and Kidlington. The stone is to be delivered at the dates and places and in the quantities to be specified in the surveyor's written orders, to be sent by post to the stone contractors, and the whole of the stone is to be supplied before Oct. 1, 1907. A person tendering, if his tender is accepted, will be required to sign a written agreement to supply the stone in accordance with the terms of this advertisement and the surveyor's orders. Tenders and samples must be delivered to A. G. Higgs, clerk to the District Council, Woodstock, in Woodstock on or before Oct. 24. Wharfage and railway charges are payable by the stone contractors,

SANITARY.

Oct. 22. Dublin.—*Supply of two four-stall urinals*, made of cast-iron, and fitted with white enamelled fireclay stalls, between the upright iron divisions. Intending contractors are required to furnish a trace plan, giving thereon figured dimensions showing the exact class of urinal which they propose to supply for the price quoted; also a detailed description of the urinals and fittings. The contractor whose tender is accepted shall deliver the urinals, which will be erected by the Corporation staff, to the Waterworks Yard, Fishamble Street. Tenders addressed to the Chairman, Improvements Committee, City Hall, Dublin, and endorsed "Tender for Urinals," must be received by P. Tobin, secretary, Improvements Committee, City Hall, not later than 12 o'clock noon on Oct. 22. The work to be executed under this contract shall be done entirely by local labour, and where this is considered impracticable, the contractor shall apply to the Municipal Council for permission to have the work done by other than local labour. The workshops, factories, and other places used by the contractor in the execution of the contract shall be open to inspection at any time during working hours by a duly authorised representative of the trade affected by such contract, upon the production of a permit signed by the Town Clerk or other officer appointed by the Supplies Committee of the Corporation.

Oct. 29. Waterloo.—*Supply and delivery of cast-iron piles*, and about 2,000 yds. of cast-iron pipes for sewerage work for the Waterloo-with-Seaforth U.D.C. The drawings may be seen and specifications, bills of quantities, and forms of tender obtained on application to F. Spencer Yates, Assoc.M.Inst.C.E., the surveyor to the Council, at the Town Hall, Waterloo on payment of a deposit of £1 1s Sealed tenders, on forms supplied, endorsed "Tender for Cast-Iron Pipes," and addressed to the Chairman of the Health Committee, are to be delivered at the Town Hall, Waterloo, not later than 12 o'clock noon on Oct. 29.

Oct. 30. Uttoxeter.—*Provision laying and jointing* of about 2,800 yards of 9in. stoneware pipe sewers, together with manholes, lampholes, and other incidental works for the Uttoxeter U.D.C. Plans and specifications may be seen at the offices of Willcox & Raikes, engineers, 63, Temple Row, Birmingham, from whom bills of quantities and form of tender may be obtained on payment of a deposit of £2 2s. Sealed tenders, in envelopes supplied, endorsed "Uttoxeter Sewerage Extension," to be delivered to F. S. Hawthorn, clerk to the Council, Market Place, Uttoxeter, not later than Oct. 30.

MISCELLANEOUS.

Oct. 18. London, E.C.—*Supply of the following stores:* Wheels and axles; bearing springs; helical and volute springs; steel fishbolts, nuts and washers; Sheffield tools; bolts, rivets, coach screws and spikes; zinc sheets, &c., for the Great Indian Peninsula Railway Company. Specifications and forms of tender may be obtained at the company's offices, 48, Copthall Avenue, E.C., London, on payment of the fee for the specification. Tenders must be delivered in sealed envelopes, addressed to J. I. Berry, secretary, Company's Offices, marked "Tender for Wheels and Axles," or as the case may be, not later than 11 o'clock a.m. on Oct. 18.

Oct. 18. Belgium.—*Supply of 2,400 metres of electric cable* for a 120-ton shear for the municipal authorities. The specification (*Cahier des Charges*, No. 1,163) relating to the contract may be obtained from the Hotel de Ville, Antwerp. All tenders should be sent in sealed registered envelopes, addressed "A Monsieur le Bourgmestre de la ville d'Anvers." and should reach the Hotel de Ville not later than Oct. 18. A deposit of £20 is required to qualify any tender. A copy of the specification may be seen at the offices of the Commercial Intelligence Branch of the Board of Trade, 73, Basinghall Street, London, E.C.

Oct. 20. Manchester.—*Supply of* (a) such quantity of glazed earthenware sewer pipes, &c., as they may require during the ensuing twelve months; (b) pitch and creosote oil, for the Paving, Sewering and Highways Committee of the Manchester Corporation. Forms of tender may be obtained on application to the Chief Clerk, Paving, &c., Department, Town Hall, Manchester. Tenders must be received by Oct. 20.

Oct. 23. London, S.W.—*Supply of bridgework*, 30, 40, and 60-ft. spans. The conditions of contract may be obtained on application to the Director-General of Stores, India Office, Whitehall, S.W., and tenders are to be delivered at that office by 2 p.m. on Oct. 23.

Oct. 29. London, W.—*Supply* of the following stores from the 1st of Dec. next to the 30th of Nov., 1907, for the Directors of the Great Western Railway Co.:—Bricks; lime, plaster of paris, and cement; stone, artificial stone paving, slates, drain pipes, and crucibles; firebricks and fireclay; colours, paints, white and red lead, &c.; varnishes; zinc, antimony, brass, copper rivets, &c.; tin plates; wire—iron and steel; rivets, bolts and nuts, &c.; fishplates, and bolts and nuts for permanent way; nails, screws, &c.; eaves, gutter, stack pipe and fittings; locks; steel tools (files, saws, shovels, &c.); platelayers' tools; ironmongery—general: brasswork—builders' and general for railway carriages: pressure gauges and water fittings; brass gasfittings; galvanised goods; sanitary ware and fittings; fencing and gates. Samples and patterns may be seen at the General Stores, Swindon, from Oct. 17 to Oct. 25, on application at the office of the Stores Superintendent, Swindon, at the following hours:—Monday to Friday, 10 a.m, to 5 p.m.; Saturday, 10 a.m. to 12 noon. Specifications and forms of tender (upon which alone tenders can be received), may be obtained at the office of the Stores Superintendent at Swindon. Tenders addressed to G. K. Mills, secretary, Paddington Station, London, and marked outside "Tender for Stores," will be received on or before Oct. 29.

Oct. 30. Egypt.—*Supply of ironmongery fittings* for buildings and for furniture for the Egyptian State Railways. Tenders, accompanied by a stamped paper of 30 millièmes, should be placed in sealed envelopes marked "Tender for the Supply of Ironmongery," and addressed to the General Manager, Egyptian State Railways, Cairo, where they will be received up to noon on Oct. 30. Copies of the conditions and form of tender (price 4s.) may be obtained from Lieut.-Col. Western, R.E., C.M.G., Queen Anne's Chambers, Westminster, S.W., where also samples may be seen. A copy of the conditions may be seen at the Commercial Intelligence Branch of the Board of Trade, 73, Basinghall Street, E.C.

Oct. 30. Netherlands.—*Supply of*, for the Company for Exploitation of State Railways:—Contract 220.—530,000 steel plates. Contract 221.—15 metric tons of steel "tirefonds," 610 metric tons of screw, hook, and other descriptions of bolts. Contract 222.—230,000 fir sleepers. Contract 223.—36,000 oak or beech sleepers. Contract 224.—Oak or beech sleepers for bridges, and timber for points, Tenders should be delivered at the Central Bureau of the Company, Moreelse Park, Utrecht, before 2 p.m., on Oct. 30. Copies of the contracts may be obtained at the said Bureau (1st Department, "Dienst Weg en Werken") on payment of Fl. 0·50 (10d.) per contract.

TOO LATE FOR CLASSIFICATION.

Oct. 30. Rhondda.—*Alterations and additions to the Isolation Hospital*, Ystrad, Rhondda, including the erection of a pavilion, combined convalescent and discharging block, and additions to the present administrative block, laundry, and stable blocks for the U.D.C. Plans and specification may be seen and bills of quantities and tender forms obtained at the office of W. D. Morgan, architect, Post Office Chambers, Pentre, upon the production of a receipt for a deposit of £2 2s. from the accountant of the Council, which can be obtained at the Council Offices, Pentre. Fair wages clause. Sealed tenders, endorsed "Tender for Hospital Extensions," must be delivered before noon on Oct. 30, at the Council Offices, Pentre, Rhondda, addressed to "The Chairman of the Health Committee, Rhondda U.D.C."

Oct. 25. Bridlington.—*Alterations, repairs, cleaning and decoration* of the Baptist Church, Bridlington. Drawings and specifications may be inspected at the office of J. Earnshaw, architect, Carlton House, Bridlington, where sealed and endorsed tenders are to be sent not later than 5 o'clock on Oct. 25.

Oct. 22. Middlesbrough.—*Alterations and additions to the existing hospital* buildings at North Ormesby. Persons desirous of tendering are requested to send their names and addresses on or before Oct. 22 to J. M. Bottomley, Son and Wellburn, architects, 28, Albert Road, Middlesbrough.

Nov. 3. Nordelph.—*Conversion of house into two cottages*; drainage and sub-division of yard and buildings; fencing of grass land at the Chapel Farm, Nordelph. Plans and specifications and conditions of contract may be seen at E. C. Warner's, at Nordelph, who will arrange for inspection of the premises. Tenders, in sealed envelopes, must be delivered to G. C. Davies, deputy clerk of the Norfolk County Council, 11, Prince of Wales Road, Norwich, on or before Nov. 3, and endorsed "Nordelph Tender." Each tender must state within what time the contractor will undertake to complete the work, as time is of importance.

Nov. 9. Willington.—*Erection of stone walls* to enclose new cemetery ground at Willington, for the U.D.C. Plans and specifications may be seen and all particulars obtained, on making an appointment with the surveyor. Tenders to be delivered to J. G Wilson, clerk to the Council, 5, North Bailey, Durham, on or before Nov. 9, marked "Cemetery Extension."

Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, *Great New Street, Fetter Lane, E.C.*

Armagh.—For the erection of artisans' dwellings on Banbrook Hill, in the city of Armagh, the clearing and laying out of the site, the construction of roads, paths, sewers, manholes, and other works, for the Armagh U.D.C.:—

A. C. Simpson, Railway Street	£7,753	17	8
T. Collen, Tandragee	7,634	2	0
Collen Bros., Portadown	7,126	0	0
McKee & McNally, Dungannon	7,857	0	0
D. P. Martin & Co., English Street	7,198	6	0
J. Fitzpatrick, Edward Street ...	6,434	8	8
P. McKenna,* Castle Street ...	6,197	0	0

Accepted. (Rest of Armagh.)

Barking.—Tenders for raising river walling and flood-bank, and certain other works, at the Barking outfall, for the London County Council:—

Tilbury Contracting & Dredging Co. (1906), Ltd., Great Tower Street, E.C.	£1,695	13	8
Leggott & Speight, Hull...	1,597	19	6
W. Muirhead & Co., Queen Victoria Street	1,595	15	9
John Cochrane & Sons, Victoria Street	1,316	8	7
D. T. Jackson, Barking	1,217	5	3
Greig & Matthews, Queen Victoria Street	1,161	11	8
J. Smith, Barking*	1,060	0	0

*Recommended for Acceptance.

Belfast.—For supplying and fitting up machinery at the new central laundry at the Union Workhouse, for the Guardians:—

Smith & Paget	£1,091	6	6
D. & J. Tullis	1,059	5	0
R. Patterson & Co.	1,049	0	0
I. Braithwaite & Son	1,034	10	0
Goddard, Massey, and Warner ...	1,027	0	0
T. Bradford & Co.	1,016	0	0
W. Summerscales & Sons	1 008	15	0

Bicester. Oxford.—Accepted for the erection of cottages for Mr. George Harris. Mr. Frank Mountain, M.S.A., architect, 13, Cornmarket Street, Oxford:—

Layton & Don	£1,280

Catchgate (Lancashire).—Accepted for the additions and renovation, &c., of Lay Church, Catchgate, for the Trustees. Mr. Thomas E. Taylor, architect, Prospect House, Lanchester:—

F. Ward, anchester	£1,169

Note.—13 tenders received.

Dudley.—Accepted for the erection of steam bakery, Tower Street, for Mr. T. Woodhouse. Mr. William F. Edwards, architect, Birmingham and Blackheath:—

Oakley & Coulson, Dudley	£1,369

Frimley.—For the ballasting and metalling of 7¾ miles of roads in their district, for the Frimley U.D.C., Mr. T. Clement Jones, C.E., engineer and surveyor Municipal Offices, Camberley:—

E. M. Smith, Frimley Green... ...	£16,491	18	0
Tilbury Contracting & Dredging Co., 74, Great Tower St., E.C....	15,753	10	8
S. Kavanagh & Co., Surbiton Hill	15,412	19	0
Ripley, Strong & Co., Farnborough	15,275	6	7
C. A. Zadig & Co., 73, Queen Victoria Street, E.C.	14,524	17	0
J. Knight, Camberley	14,298	0	6
G. A. Franks, Guildford	13,515	10	6
F. Osman, Southampton...	13,473	14	11
W. North, Aldershot	13,121	2	9
A. F. Lee, High Wycombe	11,732	4	8
Martin, Wells & Co., Aldershot ...	11,684	0	0
A. Streeter & Co.,* Godalming ...	11,021	3	1

Engineer and surveyor's estimate, £13,457 15s. 9d.
* Accepted.

London, N.E.—For the erection of shop and private house at Leyton. Mr. Herbert Riches, architect, 3, Crooked Lane, King William Street, London, E.C.:—

Perry & Co.	£1,800	0	0
Shurmur & Sons	1,593	0	0
E. J. Good	1,590	0	0
Osborn & Sons	1,357	0	0
Clemens Brothers*	1,340	10	0

*Accepted.

London, N.W.—Accepted for repairs and decorations to "House," Carlton Vale. Mr. Herbert Riches, architect, 3, Crooked Lane, King William Street, E.C.:—

Osborn & Sons	£185	0	0

London, S.W.—For the execution of the roadwork and platelaying in connection with the construction of the Westminster Bridge and Victoria Embankment tramways, for the L C.C.:—

J. Mowlem and Co., London . .	£47,744	0	0
J. G. White & Co., London ...	46,334	16	2
Dick, Kerr and Co.,* London ...	45,836	14	2

Chief Engineer's estimate, £47,019 1s. 6d.
* Accepted.

St. Albans.—For the erection of a villa residence in Carlisle Avenue, for Mr. Walter Freeman. Mr. S. Doddimeade Edmunds, M.S.A., architect, St. Albans:—

Vail & Shore	£626	10	0
H. J. Skelton	560	0	0
A. A. Ivory...	495	10	0
J. Elwood*...	475	0	0

* Accepted. All of St. Albans.

St. Albans.—For the erection of a detached residence in Clarence road. Mr. S. Doddimeade Edmunds, M.S.A., architect, St. Albans:—

Goodchild & Son...	£1.017	10	0
H. J. Skelton...	980	0	0
J. Elwood	950	0	0

All of St. Albans.

St. Albans.—For the erection of a house in Clarence Road. Mr. S. Doddimeade Edmunds, M.S.A., architect, St. Albans:—

H. J. Skelton...	£880
W. Goodchild & Son	864

Both of St. Albans.

St. Albans.—For the erection of a detached villa residence in Blandford Road, for Mr. C. W. Little. Mr. S. Doddimeade Edmunds, M.S.A., architect, St. Albans:—

E. Dunham	£745	0	0
Goodchild & Son...	610	0	0
H. J. Skelton	555	0	0
Vail & Shore*	519	0	0
A. A. Ivory	510	15	0
J. Elwood	515	0	0

*Accepted. (All of St. Albans).

St. Albans.—For the erection of a house and shop in Catherine Street, for Mrs. S. E. Smith. Mr. S. Doddimeade Edmunds, M.S,A., architect, St. Albans:—

H. A Williamson	£629
H. J. Skelton	525
J. T. Bushell	515
W. J. Bastin	510
Goodchild & Son*	470
J. Elwood	465

*Accepted. (All of St. Albans.)

St. Albans.—For the erection of a residence and motor house, &c., in Sand Pit Lane, for Mr. F. W. H. Hutchinson. Mr. S. Doddimeade Edmunds, M.S.A., architect, St. Albans:—

	House.	Motor House, &c.	Total.
H. J. Skelton ...	£1,730	£385	£2,070
E. Dunham ...	1,498	213	1,711
Vail & Shore* ...	1,193	145	1,337

* Reduced and accepted at £1,205. (All of St. Albans.)

St. Albans.—For sundry additions, alterations and decorations at "The Deanes," Althorp Road, for Mr. Jonathan Lynn. Mr. S. Doddimeade Edmunds, M.S.A., architect, St. Albans:—

	House.	Motor House.	Total.
Goodchild & Jeffry, Radlett	£598 ...	£425 ...	£1,023
E. Dunham	482 ...	398 ...	880
C. Miskin & Sons* ..	430 ...	360 ...	790
H. J, Skelton	470 ...	280 ...	750

*Accepted for house only, Decoration contract. £85 extra. (Rest of St. Albans).

London, S.W.—For the erection of twelve cottages (blocks 26 and 27) on section A of the Totterdown Fields Estate, Tooting, for the London County Council:—

Tom Morley, junr., Upper Norwood	£3,710	0	0
C. S. Merrett & Co., Putney	3,296	0	0
W. & C, Brown, Wandsworth ...	3,170	0	0
Prestige & Co., Grosvenor Rd.. S.W.	3,068	0	0
E. Lawrance & Sons, City Road, N.	3,044	0	0
J. S. Carmichael, Wandsworth ...	3,020	0	0
Chas. Wall, Ltd., Fenchurch Street	2,924	0	0
F. & T. Thorne, Isle of Dogs... ...	2,902	0	0
H. L. Holloway, Deptford	2,760	0	0
Jones, Brothers, Tooting	2,760	0	0
Kirk & Randall, Woolwich	2,728	0	0

PERFECTION
IN
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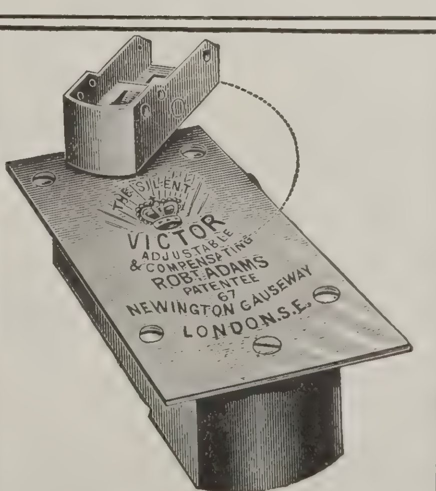

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Architect's estimate £2,600.

* Recommended for acceptance.

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R. Colhoun,* Strand	8,970	0	0

* Accepted.

London, W.C.—Accepted for the erection of new municipal offices for the Holborn Borough Council. Messrs. Warwick & Hall, architects, London.

J. Greenwood, Ltd. ... ... £22,025.

Oxford.—Accepted for the erection of six houses in Lonsdale Road, for Councillor Francis Twining, Mayor of Oxford. Mr. Frank Mountain, M.S.A., architect, 13, Cornmarket Street, Oxford :—

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E. Mills, Westcombe Park	£2,900	0	0
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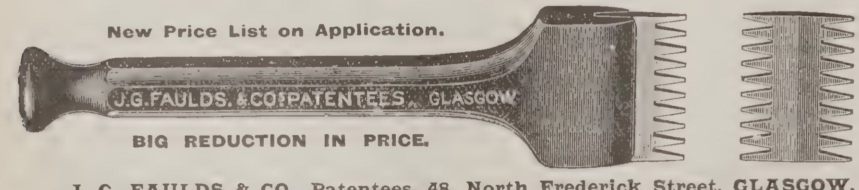

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Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—adjudication.]

DURING THE WEEK ending October 12th twenty-five failures in the building and timber trades in England and Wales were gazetted.

E. LARKINS, builder, Putney. Adj., Oct. 1.

C. F. STEER, builder, Brixton. Adj., Oct. 4.

J. SMITH, contractor, Tollington Park. Adj., Oct. 3.

W. HUNTER, plumber, West Hartlepool. R.O. Oct. 5.

J. BROWN, timber merchant, Southport. R.O., Oct. 5.

PARKINSON & SON, builders, Southall. R.O., Sept. 29.

T. LIVERSEDGE, master painter and paperhanger, Middlesbrough. Oct. 5.

R. HENDERSON, builder, Westcliff-on-Sea. P.E., Shirehall, Chelmsford, Nov. 7, at 10.

F. COOKE, contractor, Brighton. First meeting, O.R.'s, Brighton, Oct. 17, at 12. P.E., Brighton C.C, Oct. 18, at 11. R.O., Oct. 3.

E. DOGGETT, builder, Fulham. First meeting, Bankruptcy Court, Oct. 19, at 11. P.E., Bankruptcy Court, Nov. 8, at 11. R.O., Oct. 5.

J KEMPSTER, builder and contractor, Bristol. First meeting, O.R.'s, Bristol, Oct. 17, at 12. P.E., Guildhall, Bristol, Oct. 26, at 12. R.O., Oct. 1.

C. COMBER, builder, Southend-on-Sea. First meeting, The Institute, Southend-on-Sea, Oct. 18, at 12. P.E., Shirehall, Chelmsford. Nov. 7, at 10.

Partnerships

Dissolutions of Partnerships.

[*The date when the partnership was dissolved is given in parenthesis where known.*]

INNESS & SON, builders and brickmakers, Oxford (Aug. 17).

G. HUDSON & Co., joiners, Paddington (Sept. 29). Debts by G. R. Hudson.

H. & W. BARRACLOUGH, contractors, Brighouse (Sept. 19). Debts by H. Barraclough.

BROADBRIDGE & PORT, timber merchants, Canterbury (June 27). Debts by R. J. Port.

FOWLER & SONS, builders, Birmingham (Sept. 12). Debts by A. Fowler, who continues.

BROADBANK & HYMAS, builders and contractors, Harrogate (Sept. 22). Debts by S. Broadbank.

HOLT & HAWLEY, tile merchants and contractors, Brixton Hill (Sept. 15). Debts by M. Holt.

HALL & DAVIDSON, painters, paperhangers, and decorators, Hyde (Sept. 6). Debts by G. W. Davidson, who continues.

LYTHE & CLARKSON, painters, paperhangers and decorators, Harrogate and Starbeck (Sept. 15). Debts by G. Clarkson, who continues as George Clarkson.

Coming Events.

Wednesday, October 17.

ARCHITECTURAL ASSOCIATION (Discussion Section).—Mr. M. G. Pechell on "Motor Garages," at 7.30 p.m.

Thursday, October 18.

CHEMICAL SOCIETY.—Meeting at Burlington House, at 8.30 p.m.

SOCIETY OF ARCHITECTS.—Twenty-second Anniversary Meeting, at 8 p.m.

Friday, October 19.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—Smoking concert and exhibition of drawings at Midland Hotel.

ARCHITECTURAL ASSOCIATION.—Mr. Alan Potter on "The Architecture of the Roman Empire," at 7.30 p.m.

Monday, October 22.

ROYAL SANITARY INSTITUTE.—Mr. W. C. Tyndale, M.I.C.E., on "Sanitary Appliances," at 7 p.m.

Friday, October 26.

ROYAL SANITARY INSTITUTE.—Mr. A. Saxon Snell, F.R.I.B.A., on "Ventilation, Warming and Heating," at 7 p.m.

Monday, October 29.

ROYAL SANITARY INSTITUTE.—Mr. W. C. Tyndale, M.I.C.E., on "House Drainage," at 7 p.m.

Tuesday, October, 30.

ARCHITECTURAL ASSOCIATION OF IRELAND.—Mr. J. A. Gotch, F.R.I.B.A., on "The Development of Domestic Architecture from 1200 to 1800," at 8 p.m.

Wednesday, October 31.

ARCHITECTURAL ASSOCIATION (Discussion Section).—Mr. G. M. Nicholson, F.S.I., on "Quantities and Cost," at 7.30 p.m.

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October 17, 1906.

CONTRACTORS' SUPPLEMENT (MONTHLY).

LABOUR IN THE COLONIES.

The October circulars of the Emigrants' Information Office, of 31, Broadway, Westminster, S.W., reporting upon the present prospects of emigration, as regards building trade employees, state:—

In Canada work in railway construction has been very brisk. It is too late in the year for the ordinary emigrant to go there now, unless he goes to friends or has enough money to live on during the winter. The plumbers' strike at Winnipeg still continues.

As regards the Commonwealth of Australia, reports from several places in New South Wales show that there is practically no demand for more labour of any kind. At Young, however, there is a good demand for general labourers, and a fair one for a few carpenters, joiners, bricklayers, stonemasons and blacksmiths. In Victoria, men in the building trades have been wanted at Bendigo. In South Australia, Queensland, and Western Australia there is no demand for more labour.

In New Zealand, men in the building, engineering, clothing, and boot trades, and in the saw-mills, have been generally busy, and in some places there has been a difficulty in procuring competent men.

Men in the building trades especially are warned against going to Cape Colony. Bricklayers' labourers are coloured men, as well as large numbers of bricklayers and plasterers.

In Natal there is a plentiful supply of skilled and unskilled labour, and no more is wanted.

Persons are warned against going to the Transvaal at the present time in search of work, as the local supply of all kinds of labour is more than sufficient. The building trades at Johannesburg are bad, and large numbers of masons, carpenters, bricklayers, plasterers and others have left the country through inability to obtain employment. Owing to this exodus there is a large number of empty houses, which fact has the double effect of lowering rents and stopping further building operations.

In the Orange River Colony there is no demand whatever for labour.

A NATIONAL CO-OPERATIVE BUILDINGS SOCIETY.

The latest industrial project is the establishment of a National Co-operative Buildings Society, which shall carry out contracts of all kinds for the erection of buildings of every description, the profits being devoted to extension, and to the formation of a political fund, out of which the expenses of running candidates for municipal and Parliamentary seats will be defrayed. A circular upon the matter has been sent to every trade union and branch of a union associated with the building industry, and committees are to be formed for Scotland in Glasgow, for England in London, Wales in Cardiff, and in Ireland at Dublin or Belfast. From these local or sectional committees will be formed a committee of ways and means, to devise the best method of raising funds. The project originates with the National Amalgamated Society of Operative House and Ship Painters.

THE PAINTING TRADE.

Commercialism and Craftsmanship.

At the annual conference of the National Association of Master House Painters and Decorators, held at Leeds last week, Mr. E. H. Mattey (Birmingham) contributed a paper on "The Present-day Condition of the Painting Trade—Commercialism and Craftsmanship." Dividing his subject into four sections, Mr. Mattey first touched upon the question of education. In no business, he said, was a working knowledge of the trade more necessary than among master painters; no trade where the personal factor was more needed. A master painter should be a draughtsman, colourist, naturalist, chemist, organiser, mathematician, and a gentleman. Were not the workmen what commercialism had made them, and did not the employers too often regard them as "hands," and not men? True commercialism, he went on to say, would insist on the best production. Technical schools and schools of art had been provided by many municipalities, and would do good if rightly used. But he was convinced great sums of money were wasted, rates and taxes being paid away in a shoddy form of instruction, largely, if not entirely, because commercial men had not realised that they should interest themselves in the work carried on. Mr. Mattey went on to suggest the institution of local competitions and exhibitions of work, while local lectures might be given to masters, men and the public. They grumbled, he said, because in competitive work public bodies and private clients too often considered the cost first and the quality afterwards. Cheap labour was one cause of that state of affairs, and he held it should be the business of trade unions to see that capability should be a condition of membership. He held that they should demand of trade unions that they should give them capable men. Mr. Mattey added that there was only one honest way of pricing work, which was that each job should pay its own way. There must be competition, but why should there be this game of beggar-my-neighbour?

Mr. Mattey proceeded to speak of the quality of work, and urged that the public got better value out of an accomplished craftsman than out of a man whose chief asset was ignorance. Public authorities, he held, could do very much to prevent the present system of putting layer upon layer of paper on the walls of dwelling-houses, and covering up the dirt and grime of disease. There was a tendency, too, in some quarters, to use showy, ready-made ornamentation, but he believed the average home was more artistic in its decoration than formerly. This necessitated on the part of the painter an increased knowledge of restraint, fitness, selection, and method, because the simple work was often more difficult to perfect.

Builders' Notes.

The creditors of Hackney Joinery, Limited, are required, on or before October 25th, to send their names and addresses, and the particulars of their debts or claims, and the names and addresses of their solicitors (if any), to Mr. Herbert G. Middleton, of 31, Preston Road, Leytonstone, the liquidator of the company.

The Yorkshire Building Trade.—Mr. P. H. Bagenal, District Inspector of the Local Government Board, in addressing the Ripon Board of Guardians, said that reports received from relieving officers in large and small towns showed that the building trade had never been in so bad a condition for 25 years. That hit workmen such as joiners, carpenters, plasterers, and bricklayers' labourers.

Manchester Bricklayers' Dispute Settled.—After a month's idleness a settlement has been arrived at in the dispute between Messrs. R. Neill & Sons, builders, Manchester, and their bricklayers. The men employed in the erection of the Prestwich Union Infirmary, at Blackley, claimed walking time, on the ground that the site was outside the two miles' radius, but Messrs. Neill declined to pay, on the contention that as the men had been engaged on the spot the rule did not apply. The result was that the men were withdrawn from that and other jobs in the district, and a number of others were brought from different parts of the country to fill the vacant places. As the result, however, of a conference, Messrs. Neill & Son have agreed to concede the men's claim.

Training Brassworkers. — The brassfounders of Birmingham and district have issued an appeal for funds for the establishment of a municipal trade school for brassworkers. The idea is that the institution should not bring into existence a still greater amount of mediocre ability, but improve that which is already in existence. The ultimate aim, it is pointed out, is not so much the instruction of boys outside the trade as a cultivation of the young men and adults who are already in the workshops. To this end the essence of efficiency would lie in the ability of the teaching staff. It is proposed, if funds permit, to institute scholarships which will enable the more proficient scholars to finish their studies in Paris or Berlin, on the condition that they return to Birmingham for a certain period to impregnate the city with the broader ideas obtained by their travels.

The Month's Trade

Reports by our Special Correspondents.

THE STONE, GRANITE AND MARBLE TRADES.

In these trades the improvement shown in the last few months has continued. The granite trade even has shown some few signs of life, and it is evident that there is a gradual upward movement. Employment in the limestone and sandstone quarries continued good in Weardale and Cumberland, and also in Derbyshire. It was, however, only fair in South Durham, North Wales, and the Plymouth districts; while in the Somerset blue lias quarries employment continued dull.

As regards other kinds of stone, in the Forest of Dean stone quarries employment has been fair; while at Portland it has been moderate. The Bath stone quarries have been slack, while the Pennant stone quarries in the Bristol district have been very badly employed. The sandstone quarries of North Wales secured a fair amount of work. As one would expect from the revival of trade in the Midlands, the Sheffield, Barnsley, and Rotherham quarries, although they were generally working full time before this, received a still further improvement. In Forfarshire short time has had to be resorted to.

The chert quarries in Derbyshire have been well employed, considerable overtime being necessitated to meet the rush of work. The road material quarries in the Gateshead and Clee Hill districts have continued fair, with perhaps a slight improvement.

In the granite quarries employment continued moderate on the whole in Aberdeenshire. In Leicestershire employment was rather worse than a month ago, when it was reported as fair. Employment was good generally in North Wales, and a further improvement was shown in Devonshire and Cornwall.

As regards settmaking, employment continued fair in Aberdeenshire. It continued good at Stoney Stanton, Airdrie, and Glasgow, and was good generally in North Wales. At Rowley Regis employment was moderate through want of stone, though rather better than a month ago. It was bad, and worse than a month ago, at Edinburgh.

The returns for imports of stones, slabs and marble, rough, hewn and manufactured, for the month of September, 1906, as compared with the same month in 1904 and 1905, are as follows :—

Tons.			Value.		
1904.	1905.	1906.	1904.	1905.	1906.
107,811	101,021	85,526	£120,615	£113,908	£96,261

The great depression existing in the building trade and the resulting falling off in the demand for stone and other materials are held responsible for a substantial decline in the profits of that hitherto very successful concern, the Bath Stone Firms. The amount earned in the half-year to the end of June last was only £9,641, in comparison with £18,508 for the corresponding six months of 1905. The balance brought in is also lower, being £13,481, as against 15,850, so that the amount now available for distribution (£23,123) is £11,233 smaller than the corresponding total. The directors are consequently compelled to curtail the dividend, and to distribute at a lower rate than has been usual of late years, the payment proposed being at the rate of only 8 per cent. per annum, as against 14 per cent. twelve months ago. The balance then remaining to be carried forward is £14,039, as compared with £18,463. The directors express the hope that the present state of things will be found to be temporary, and that a revival in the building trade will not be long delayed. Meanwhile the company may be congratulated upon its strong financial position. It has a general reserve of £20,000, and the total provision made for depreciation, including £4,288 in respect of the past half-year, is £97,722.

THE CLAYWORKING INDUSTRY.

A steady improvement, if somewhat slow in rate, has now been noticeable for the past four months in the brick and tile trades. This is eminently satisfactory, and though the trade is not by any means brisk, and, compared with prosperous former years, might be called depressed, yet there is no reason for grumbling, as the improvement continues. As we have stated before, this continuance suggests that the improvement is more than a seasonable one. In fact, if it were, it should now be somewhat falling off. The building trade is on every hand showing progress, and the brick and tile trades are sharing in the movement. The cotton, engineering and several agricultural districts have had a very prosperous year, and there is a natural reflection in the building trade; consequently we find employment has been good in Oldham, Norfolk, Suffolk, Essex and Wales. In the Tees and Plymouth districts and in South Staffordshire trade has been fair. At Peterborough, although there is a considerable improvement, trade still remains quiet. In the Birmingham district it is bad, though things will shortly improve, as one of the principal brickmakers in Birmingham and the Midlands has secured contracts for the supply of 8,000,000 bricks, which will take two years to complete. At Nottingham the brick and tile trades have been slack and a retrograde movement has taken place. On the whole, however, it is obvious that there is nothing at present to suggest that these trades will suffer another setback.

THE PORTLAND CEMENT TRADE.

Manufacturers of Portland cement continue to be busy, and will begin the winter months with much lower stocks than they had a year ago. Enquiries for export have been less numerous, but they are again showing signs of improvement, and it is to be hoped that this will continue during the winter months, which is usually a depressed time for the manufacturer and his workpeople. We know of several instances of cement being sold during last winter and early spring at lowest prices on record simply owing to large accumulations of stock, and our information leads us to believe that, without exception, these same factories will begin this winter with practically empty warehouses. Diminution of imports and a very large increase in exports have combined to bring this state of things about, and as these causes continue, it is obvious that the manufacturer will enter upon the slack period this year with far less anxiety than for several years past.

The most striking feature in the position continues to be the substantial diminution in the imports of cheap natural cement into the United Kingdom. Month after month these imports have fallen away, and for the nine months to the end of September last at 132,956 tons, they show a diminution of no less than 50,600 tons compared with the same period in 1905. It is a matter that the general community can congratulate itself upon, for it is to the interest of no one but the foreign maker and his agent in this country that constructional work here should be carried out with material that is notoriously unequal to the genuine artificial Portland cement produced at home. In this connection it will be of interest to dealers and consumers alike to be informed that a new building at Haltern in Germany, erected in reinforced concrete, has collapsed on account of the use of Belgian natural cement.

Manufacturers have concluded their contracts with the gas companies for their supplies of fuel for next year, and as we have reason to believe that this has involved a rise of 3s. per ton, buyers of cement may expect to have to pay at least an additional 1s. 6d. per ton for their supplies to cover increased cost of fuel and other supplies, for the manufacturer must secure this in order to preserve his position and without in any way adding to his profit. The building trades unfortunately continue dull, but better times are bound to come if the improvement in practically all other trades continues.

The returns of imports and exports of cement for building and engineering purposes for September, 1906, as compared with the same month in 1904 and 1905 are as follows :—

IMPORTS.

	1904.	1905.	1906.
Tons	22,557	17,116	11,058
Value	£32,609	22,502	14,204

EXPORTS.

	1904.	1905.	1906.
Tons	37,105	38,025	63,283
Value	£60,695	60,087	94,750

THE SLATE TRADE.

The slate trade is one of the few branches of the building trade which does not seem to have received any advantage from the general improvement. Employment in the Welsh quarries is still slack, and, although fair in the Festiniog and Carnarvon districts, is without upward movement. In the Ballachulish (Argyllshire) quarries only five days a week were worked. More expensive slates, as from the Westmoreland and Cumberland districts, continue the even tenor of their way. The foreign slates are also subject to little movement one way or the other, and all share in the general dulness.

THE IRON AND STEEL TRADES.

The past four weeks have shown a continued improvement. Prices have risen slightly. Joists, angles, tees and other shapes which are used in building operations are always affected by the demand for steelwork in the shipbuilding trades, railways, &c., and as the demand in these directions has continued to increase the price of structural steelwork has continued to rise. The German, Belgian and American manufacturers are also extremely busy, and they consequently do not enter our market at all seriously. Thus there is not enough competition to bring prices down, and as the demand seems on the increase both here and abroad, there is every prospect of prices continuing to advance. There has been some labour trouble in the Clyde iron trade during the past month. A strike has occurred, and in some quarters it is thought that it may spread to other districts. This has, however, not affected prices up to the present.

The returns for imports and exports in certain branches of manufactured iron and steel for the month of September, as compared with the same month in 1904 and 1905 are as follows:—

		Imports.			Exports.		
		1904.	1905.	1906.	1904.	1905.	1906.
Puddled Iron	tons	9,025	11,405	6,709	61,678	91,389	143,036
Wrought iron, in bars, angles, rods and sections		7,294	7,520	6,820	9,046	9,584	11,990
Rails		3,676	4,238	190	64,945	45,181	43,506
Steel:—Girders, beams, joists and pillars from Belgium		7,902	8,483	4,892	4,404	3,633	8,037
„ „ „ „ other countries		3,113	2,534	3,746			
Ingots, blooms, billets, slabs, sheet bars, tin plate bars, or similar partly manufactured		49,349	51,935	26,263	—	—	—
Bars, angles, rods and shapes or sections		—	—	—	11,641	15,715	14,835
Galvanized sheets (flat or corrugated)		—	—	—	27,440	36,719	30,310

The Midlands iron and steel trades were led to expect by the returns of sales and the boom in the North of England market that there would have been an increase of wages, whereas the recent return has surprised all by showing reduced sales, and wages have been reduced on the sliding scale. Staffordshire bars do not, however, show any fall in price.

As regards the North of England market, it is asserted that the pig iron trade was never so active, the production and the export never so large, as at present. In manufactured iron and steel, however, trade is not nearly so good.

In Lancashire pig and finished iron remains unmoved, but steel is quieter.

In Scotland pig and finished iron is active; though the home demand for steel has fallen off, the export demand has maintained prices, notwithstanding the strike on the Clyde.

OTHER METALS.

The copper market remains as strong as ever. The leading producers are said to be sold out for months ahead. The production is unequal to the demand. The large demands in the American home markets mean that Europe is left to go very short.

The tin market is also active, and no decline in the recent high prices is evident.

Lead has made a big rise in price during the month. In fact, prices have advanced by £1 per ton.

THE IRONMONGERY TRADE.

Employment in the lock and latch trades has been bad at Wolverhampton, and short time has been general. With makers of hollow-ware it has been good. Employment with hollow-ware stampers has been slack at Sheffield. At Birmingham with hollow-ware makers it has continued moderate; and at West Bromwich quiet, with short time.

Employment in the stoves, grates, &c., trades has continued fair at Glasgow and Falkirk. It has been quiet in Essex and slack at Rotherham and Leeds, short time being worked at the latter place.

With nut and bolt makers employment has been good at Winlaton, Dudley, and Darlaston, and in South Wales. With nail and rivet makers at Birmingham it has continued fair. At Blackheath it has continued quiet with rivet makers and fair with wrought nail makers.

Employment in the wire trade has continued good generally. At Glasgow it has remained dull with wire weavers.

The return for imports and exports for September, 1906, as compared with the same month in 1904 and 1905, are as follows:—

Imports.	Tons.			Value.		
	1904.	1905.	1906.	1904.	1905.	1906.
Wire nails	2,551	2,645	2,712	£27,862	27,392	27,604
Nails (other than wire nails), screws and rivets	1,013	765	588	15,203	14,042	11,006
Bolts and nuts	307	221	212	5,035	2,783	3,583
Exports.						
Nails, screws and rivets	2,266	1,948	2,072	41,699	38,695	37,880
Bolts and nuts	1,186	1,683	1,687	21,297	30,442	35,388

The Director of Customs in the Sudan recently stated with reference to articles mostly imported into the Sudan:—Galvanised iron (water and oil) tanks find a ready sale, as also safes. Tanks could be utilised for packing purposes with advantage. Good quality brass water-taps are recommended, as at present imports are of very inferior manufacture. A very cheap and inferior quality of iron locks, keys and door knobs is imported at present; good British fittings would find a ready sale.

THE TIMBER TRADE.

London Market in September.

The deliveries of wood in London during September showed an improvement of about 6,000 standards as compared with the corresponding month in 1905. On the face of it this would seem satisfactory enough. A careful analysis of the figures, however, shows a reduction of 2,000 standards in deliveries from the docks, while a full proportion of the heavy September importation has been delivered overside for storage elsewhere. The nett result is a total diminution in deliveries of wood in London of about 15,000 standards for the first three quarters of 1906. The London market, Messrs. Churchill & Sim report, has shown some nervousness owing to the free arrivals, and prices for deals and floorings have been inclined to droop to a small extent in consequence. The redeeming features of the present somewhat unsatisfactory conditions are to be found in the policy of shippers, who are holding what little remains for the fullest prices of the season, and in the difficulty in securing tonnage at recent quotations. The free-on-board trade in the country is in smaller compass, many buyers having satisfied all their requirements, and are only to be tempted by cheap cost and

THE GLASS TRADE.

The glass trade continues fair. Employment with sheet glassmakers and bevellers at St. Helens has been good in the past month. It was also fairly good with glassblowers in London. Plate glass bevellers at Birmingham were only fairly employed.

The returns for imports and exports of glass for the month of September, 1906, as compared with the same month in 1904 and 1905, are as follows:—

Imports.	Cwts.			Value.		
	1904.	1905.	1906.	1904.	1905.	1906.
Window and German Sheet, including shades and cylinders	70,985	110,241	96,215	£45,807	65,082	54,724
Plate	31,677	27,541	32,781	35,281	32,660	42,995
Exports.						
Plate	5,046	11,816	15,330	8,165	15,746	20,067

THE PAINT TRADES.

The paint trades continue fair. As regards materials, the returns for imports and exports for September, 1906, as compared with the same month in 1904 and 1905, are as follows:—

Imports.		Quantity.			Value.		
		1904.	1905.	1906.	1904.	1905.	1906.
White lead	Cwts.	23,542	22,710	15,918	£18,777	18,841	15,275
Zinc oxide		132,966	22,524	19,551	99,966	22,398	21,338
Other colours and pigments			118,932	128,009		73,274	76,932
Turpentine		84,963	24,527	70,413	162,212	47,173	157,791
Lac-dye, seedlac, shellac and sticklac		13,538	11,115	7,645	134,059	79,652	71,095
Linseed oil	Tons	174	872	653	3,334	14,431	12,632
Exports.							
White lead	Cwts.	23,269	35,304	34,110	22,578	34,792	36,270
Zinc oxide		112,812	5,258	9,446	134,738	5,897	11,168
Other colours and pigments			110,841	115,564		150,499	149,915
Linseed oil	Tons	2,677	2,316	2,280	51,354	47,258	54,035

THE WALLPAPER TRADE.

The wallpaper trade shows little or no movement. The Board of Trade returns of exports and imports for the nine months of this year ending September 30th show that the importation of paperhangings is nearly 20% greater than last year; the exports have improved less—namely, about 7% better than last year, and about 6% better than 1904.

The following is the return of paperhangings for September issued by the Board of Trade:—

Imports.	1904.	1905.	1906
Cwts.	—	2,151	2,218
Value	—	£6,693	6,437
Exports.	1904.	1905.	1906.
Cwts.	5,062	7,498	8,923
Value	£12,077	16,902	17,082

freight quotations, which, in the state of the market, are not forthcoming. This applies rather to the Swedish than to the Russian side, where shippers have met the market rather more freely, perhaps to the extent of selling at summer prices with only part of the high autumn freights in addition.

Messrs. Denny, Mott & Dickson's report is as follows:—"The good tone underlying business in August was well maintained in September, although the rise in the value of money tended to contract forward business. The great feature, however, in the present position is that shippers, whilst benefiting by the increased f.o.b. values, leave little room for profit to the importers on this side, who naturally are feeling the higher cost and smaller percentage of profit which at first accompanies a general rise in values."

The abstract of dock stock, consumption, etc., for September, published by Messrs. Foy, Morgan & Co., is given in the table at the foot of this page.

Dock Stock.

The stock of wood in the public docks on September 30th was:—

	Pieces.
Foreign deals and ends - - -	1,930,000
Do. battens - - - -	2,525,000
Pine deals and battens - - -	794,000
Spruce do. do. - - -	848,000
Boards, rough - - - -	3,827,000
Do. prepared - - -	6,629,000

totalling 16,553,000 pieces, as against 17,890,000 in 1905, 19,365,000 in 1904, and 20,546,000 in 1903.

In other kinds the stock was as follows:—

Foreign wainscot logs - -	268	pieces.
Do. oak timber - -	3,402	loads.
Do. fir timber - -	3,765	do.
Do. Oregon pine, &c., spars and masts - -	4,490	do.
Colonial oak timber - -	2,413	do.
Do. birch timber and planks -	6,665	do.
Do. elm and ash timber -	1,046	do.
Do. yellow pine - -	718	do.
Do. red pine - - -	209	do.
United States pitch-pine timber	16,755	do.
Do. do. deals -	90,000	pieces.
East India teak - - -	7,695	loads.

Deliveries.

The deliveries have been—

	First nine months. Pieces.	September. Pieces.
Foreign deals and ends -	2,322,000	281,000
Do. battens - -	3,661,000	351,000
Pine deals and battens -	732,000	75,000
Spruce do. do. -	809,000	77,000
Boards, rough - -	3,619,000	360,000
Do. prepared - -	10,026,000	1,022,000
Total - -	21,169,000	2,166,000

The deliveries direct from ship to craft have been—

	First nine months. P.s.h.	September. P.s.h.
Deals and battens - -	94,376	21,725
Boards - - -	18,217	3,026
Total - -	112,593	24,751

Soft Woods.

Swedish Deals and Battens.—The importation of deals was considerable during the month, and prices are not quite maintained in consequence. The London demand seems to run more and more towards battens and scantlings, of which a full supply was shipped here in September. Prepared boards have fallen a point or so, and the market cannot be called so strong as it was a month ago. The stock of these is not heavy, and the cost of fresh supplies, coupled with the higher tendency of freights, should make this easing in the values quite temporary.

Norwegian Boards.—A nominal supply of prepared boards arrived during the month. Prices, except for some few sizes, were inclined to go back to a small extent owing to the fears of a heavy autumn importation, which do not look like being realised.

Russian Deals. —Russia sent us a large supply of deals, battens and boards during the past month, but buyers have learnt the unwisdom of leaving their chartering arrangements till autumn rates and insurances make their stocks look too costly, and a considerable number of cargoes usually shipped in October made their appearance here somewhat earlier in consequence. A good demand awaited the large shipment of battens, but deals have been disappointing, and prices difficult to maintain.

Finnish Battens and Boards.—Finland sent us a full share of the larger September importation, and it has mostly been in sizes which are wanted. Prices, except for deals, have been steady, and battens have maintained the August rise, but the somewhat larger supply of them has checked any further upward movement for the present.

Prussian Timber.—A few logs of fit timber arrived during the month for special work, and the stock in the docks has been reduced, but is ample for all present demands. A curious feature of the market is the preference given to sawn pitch-pine, thus reversing the position of a few years ago. The intrinsic value of fir timber and the present lower cost, as compared to the American wood, should, however, gradually have some effect on the demand for it. A little more life is shown in the market for oak, but the demand has been running on cheap logs and not on those of prime quality.

Canadian Timber. — September again brought a small supply of pine deals to London, and only an average quantity of spruce. The stock of pine deals, though small, seems quite sufficient for the poor enquiry for them. The cost of deals of reliable quality seems to keep on growing year by year, rendering the trade in them slower and more retail in character as the prices advance. The demand for spruce has been disappointing, and the stock in the docks is higher in consequence. A light importation from the Lower Ports helped Quebec deals to a certain extent, but the market is hesitating and lifeless. In any case there seems no chance of lower prices for further supplies this season, so that a little elasticity in the enquiry would soon have an effect on values. Birch planks have been in fair demand at the reduced prices caused by a little too much stock coming forward. Elm and ash are unchanged, but the stock of oaks is heavier, and yellow pine somewhat lighter. The month closed with no addition to the stock of sawn timber, and a consequent diminution of stock in London. Prices maintain the August level to which they rebounded after the hesitating conditions of July, and buyers seem now thoroughly frightened at the cost of importing the wood. This rise in values is not artificial, though there is always an element of speculation in these quick changes. The facts seem to point to a steadier market now that a great rise has been established, and it is beginning to be recognised that the world's demand is enormous, and the cost of bringing logs to the shipping ports constantly increasing. The severe hurricane which swept over the Gulf shipping ports will not make prices any easier, but it is too early yet to estimate the damage to the industry, or whether any large quantity of logs have been lost. The London market for pitch-pine deals has been steady, but the high cost is telling on the demand. The importation of them during the month was rather below the average.

Hard Woods.

Teak.—Messrs. Denny, Mott & Dickson report that the landings in the docks in London during September consisted of 731 loads of logs and 464 loads of planks and scantlings, or a total of 1,195 loads, as against 979 loads for the corresponding month of last year. The deliveries into consumption were 341 loads of logs and 311 loads of planks and scantlings—together 652 loads, as against 1,196 loads for September, 1905. The figures show a very moderate, but nevertheless a very welcome addition to the landed stocks both of logs and planks. Seeing that of the total stocks of 7,695 loads a very full third consists of Java wood mostly of unsuitable dimensions, quite irrespective of the conflicting opinion as to the quality of this description of teak, it will be recognised that the scope for selection where picked sizes or quality is required is embarrassingly small.

Mahogany.—This market has been fairly steady, but rather free arrivals of Honduras wood have not tended to strengthen prices, as the consumption, although fairly satisfactory, has not developed in proportion to the supplies. The supply of Cuba wood has been small, and prices for this and other descriptions have been firm.

Odessa Oak.—The stocks on this side are practically exhausted, and the new shipments which should commence about the end of the year are eagerly looked forward to. Fairly good supplies are reported as likely to reach the shipping ports this season, but the enquiries for this specially prepared wood are so numerous that the outget promises to be marketed very rapidly.

ABSTRACT OF STOCK, CONSUMPTION, &C., IN LONDON DOCKS, FOR SEPTEMBER.

All Docks.	Deals (Fir).	Battens (Fir).	Pine.	Spruce.	Pitch-pine Deals.	Deals and Battens in Aggregate.	Rough Boards (All Countries).	Flooring.	Floated Timber.
	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Loads.
Public dock stock - - -	1,621,569	2,743,035	793,973	848,177	89,389	6,096,143	3,827,795	6,628,399	26,998
Monthly public dock consumption - - - -	224,495	388,316	74,876	73,939	2,792	764,418	343,996	1,010,940	2,300
Overside stock - - -	1,021,452	1,766,838	340,686	336,422	—	3,465,398	1,565,182	737,986	—
Overside consumption (estimated of dock):— 98 per cent. Sawn 63 ,, Planed	220,005	380,550	73,378	72,460	—	746,393	337,116	636,892	—
Duration of supply at same rate of consumption - -	5·95 months.	5·87 months.	7·65months.	8·09 months.	32·02 months.	6·33 months.	7·92 months.	4·47 months.	11·74 months.

Current Rates of Wages in Large Centres.

Towns.	Masons.	Bricklayers.	Carpenters and Joiners.	Plasterers.	Slaters.	Plumbers.	Painters.	Labourers.
	d.	d.	d.	d.	d.	d.	d.	d.
Aberdeen - -	8	—	8	8	8	8	8	4½–5
Accrington -	9	9	8½	9	7½	8½	—	5–5½
Ashton - under Lyne - -	9½	10	9	10	8¼	9	8½	5½–6½
Barnsley - -	9	9	8½	9	8½	8	8	6½
Barrow-in-Furness - -	9	9	8¾	9	9	8¼	8¼	6–6½
Bath - -	7½	7½	7½	7½	7½	6½ 7½	6½	5–5½
Belfast - -	8½	8½	8½	8¾	8	8½	8½	19s.wk
Birkenhead -	9½–10	9½	9½	9½	9	—	8½	5–6½
Birmingham -	10–10¾	9½	9½	10	9	9½	8½	6½–7
Blackburn -	9½	10	9	9	9	9	8	5½–6½
Blackpool -	9¾	9½	8½	9½	8½	9	8½	5½–6
Bolton - -	9½	10	9½	10	9	9	8½	6–7
Bournemouth -	8	8	8	8	8	8	7½	5½
Bradord - -	9	9	8½	8½	9	9	8	6–6½
Brighton - -	9	8	8	8	8	9	7	5½
Bristol - -	9	9	9	9	9	9	8½	6
Burnley - -	—	—	8½	—	—	—	—	—
Burton-on-Trent	8½	8½	8½	—	—	—	—	5¾–6
Bury - - -	9½	10	9½	9	9	9	8½	5–6½
Cambridge -	8½	8	8	8½	8	8½	6½	5–5½
Cardiff - -	9	9	9	9	9	9	8½	5½
Carlisle - -	8½	8½	8	8	9	8	8	5–5½
Chatham - -	8	9	8½	9	9	8½	7	5½
Cheltenham	8–8½	8	8	7¾	—	8	7½	5
Chester - -	9	9	8½	9	9	8½	7½	5–5¾
Coatbridge and Airdrie - -	9½	9½	9	9½	9	8½	9	6
Colchester -	8	8	8	9	8	9	6 6½	5–5½
Cork - - -	7⅔	7⅔	7⅔	7⅔	7⅔	8	8	3⅗
Coventry - -	9½	8¾	9	9	9	9	8	6
Crewe - -	8½	8	7	9	8	8	7	5–6
Darlington -	9	9	8½	9	9½	8	7½	6
Darwen - -	9½	9½	9	9	9	9	8¼	6
Derby - -	9	9	8½	9	9	8½	7½	5½–6
Dublin - -	8–8½	8½	8–8½	8	8	8½	7½	4¼–4½
Dudley - -	8½	8	8	8½	8	8	7	5½
Dundee - -	8½–9	10	9	8½	8½	9	8½	5¼–5½
Eastbourne -	8½	8	8	9	pce.	8	7½	5½
Edinburgh -	8½	9½	9	—	—	9	—	—
Exeter - -	8	8	7½	7½	7½	7½	6½	5
Glasgow - -	—	9½	10	9½	9	9	9	5½–6
Gloucester -	7½	8	8	7½	7½	8	7½	5
Greenock - -	9½	10	9	9½	9½	9	9	5½
Grimsby - -	—	9	8	9	pce.	—	7½	6–7
Halifax - -	9	9	8¼	8½	8½	8½	7½	6
Hartlepools -	9½	9	9½	9½	—	—	—	6¼–7½
Hastings and St. Leonards.	8½	8	8	8½	—	8	7	5½–6
Huddersfield -	9	9	8½	8½	9	7½ 8	7½	6
Hull - - -	9¼–9¾	9	9	9	9	9	8	6½–7
Ipswich - -	8	8	8	9	9	8	6½	5½
Keighley - -	8½	8½	8	7½	8½	7½	7½	6
Lancaster -	9½	10	8½	9	9	8½	8½	5½–6
Leeds - -	9½	9½	9	9½	9	9	8	6½–7
Leicester - -	9	9	9	10	9	9	8	6½–7
Leigh - -	9½	9½	9½	9	8½	9	8	6–6½
Lincoln - -	8½	8	8	9	8	8	7	5–6
Liverpool -	9½–10	9½	9½	9½	9½	9½	8½	5–6
London - -	10½	10½	10½	11	—	11	—	—
Londonderry -	7	7	7	7	6½	7	7½	15s.wk.
Macclesfield -	8	8	8	7¾	6½	7½	7½	5
Manchester -	9½–10	10	9½	10	9	9½	8¾	5½–7
Merthyr Tydfil	8½	8½	8	8½	8½	8	7½	5½
Middlesbrough	9	9½	9¼	9½	9½	9	8	6¼–6¾
Newcastle -	9½	9	9½	9½	9½	9	8½	6¼
Newport(Mon.)	8½	8½	8½	8½	8½	8½	7½	5½
Northampton -	8½	8½	8½	8½	—	8½	7½ 8	5½
North Shields -	9½	9½	9½	9½	9½	9	9	6¼–6½
Norwich - -	9	9	8½	9	9	8½	7½	5–6
Nottingham -	9½	9	9	10	9	9	8½	6½
Oldham - -	9½	10	9½	9	8½	9	8½	5½–7
Oxford - -	8½	8	8	8	8	9	7	5½
Paisley - -	9	9½	9	9½	9	9½	9	6
Perth - -	8	10	8	8	8	8	7½	5½–6
Plymouth -	8	8	8	8	8	8	7	5
Portsmouth -	8½	8½	8	8½	pce.	7½	6½ 7	6
Preston - -	9½	10	9	8½	8½	8½	8½	5½–6
Rochdale - -	9½	10	9	9	8¼	9	8½	5½–6½
Rotherham -	9½	9½	8½	8½	8	8½	7½	6
St. Helens -	9	9	9	9	9	8½	8¼	5½–6
Scarborough -	8½	8½	8	8½	30s. wk.	8	7½	6
Sheffield - -	9½	9½	9	9	9	9	7½	5½–6½
Southampton -	7½	8	8	8	pce.	8	7	5
Southport -	9	9	8¾	9	9	9	8½	6
South Shields -	9½	9½	9½	9	9½	8¾	8½	6¼
Stockport -	9½	9½	9	10	9	9	—	6–7
Stockton - on - Tees - -	9	9½	9¼	9½	9½	9	8	6¼–6½
Sunderland -	9½	9½	9¼	9½	9½	37s. wk.	9	6¼
Swansea - -	8½	—	8½	8½	—	8½	7½	5½
Torquay - -	7	7	7½	7	7	7	7	4½–5
Wakefield -	9	8½	8	8½	8	7½	7½	6
Walsall - -	9	8½	8½	8½	8½	8½	7¼	5¾–6½
Warrington -	8¾	9¼	9¼	9½	8½	9¼	—	6–6½
WestBromwich	9½–10	9	8½	9	pce.	8½	7	6–6½
Wigan - -	9½	10	9	9	8½	9	8½	5½–7
Wlverhampton	9	9	9	8½	8½	9	7½	6–6½
Worcester -	8½	8½	8½	8½	8½	8½	7	5½
Yarmouth -	7½	7½	7½	A	7½	7½	6	4½

A. Done by bricklayer.

Current Market Prices.

FORAGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	2	0	1	13	0
Clover, best...	per load	4	7	0	4	17	6
Hay, good	do.	4	0	0	4	5	0
Sainfoin mixture	do.	4	0	0	4	7	6
Straw...	do.	1	8	0	1	14	0

MISCELLANEOUS.

		£	s.	d.	£	s.	d.
Bricks Stocks, d/d to job	per 1,000	1	15	0		—	
Do. Flettons on rail ...	do.	1	5	0		—	
Do. Pressed Wire Cuts, d/d to job ...	do.	1	17	0		—	
Do. Blue brindled wire cuts	do.	1	2	0		—	
Do. do. wire cuts ...	do.	1	6	0		—	
Do. do. pressed facings	do.	1	17	6		—	
Coke Breeze, into carts at gasworks ...	per load	0	2	0		—	
Do. d/d to job	do.	0	4	0		—	
Sand	per yard	0	7	6		—	
Ballast	do.	0	6	6		—	
Granite Chippings ...	do.	0	10	6		—	
Do. do. ¼in. ...	do.	0	11	6		—	
Do. Broken, 1½in. ...	do.	0	15	6		—	
Do. do. 2in. ...	do.	0	15	0		—	
Do. do. 2½in ...	do.	0	14	6		—	
Do. Kerb, Norwegian 6×12 and 12×6 in river	per foot	0	1	2		—	
Do. do. do. circular	do.	0	1	5		—	
Do. do. do. 12×8 in river	do.	0	1	5		—	
Do. do. do. circular	do.	0	1	8		—	
Do. do. Guernsey 6×12 in river	do.	0	1	4		—	
Do. do. do. circular	do.	0	1	6		—	
Do. do. do. 12×6 do.	do.	0	1	6		—	
Do. do. do. do.	do.	0	1	8		—	
Do. do. do. 18×8 do.	do.	0	1	8		—	
Do. do. do. do.	do.	0	1	10		—	
Do. Pitchings, Norwegian, 3×6	per ton	1	8	0		—	
Do. do. do. 3×7	do.	1	10	0		—	
Do. do. do. 3×5	do.	1	9	0		—	
Do. do. do. 4×5	do.	1	8	0		—	
Do. do do. 4×4	do.	1	13	0		—	
Do. do. do. 4×6	do.	1	5	0		—	
Do. do. do. 5×6	do.	1	4	0		—	
Do, do. do. 5×7	do.	1	4	0		—	
Do. do. do. Special, 4×6	do.	1	11	0		—	
Do. do. do. do. 5×7	do.	1	18	0		—	
Do. do. Guernsey, 3×6	do.	1	10	0		—	
Do. do. do. 3×7 & 3×9	do.	1	8	6		—	
Do. do. do. 3×5	do.	1	10	0		—	
Do. do. do. 4×5	do.	1	10	0		—	
Do. do. do. 4×4	do.	1	13	0		—	
Do. do. do. 4×6	do.	1	9	0		—	
Do. do. do. 4×7	do.	1	6	6		—	
Do. do. do. 5×6	do.	1	6	0		—	
Do. do. do. 5×7	do.	1	5	0		—	
Do. do. Specials add.	do.	0	6	0		—	
Glass, English Sheet, in crates of stock sizes, 15oz., 2nds	per sq. ft.	0	0	3⅓		—	
Do. do. do. do. 3rds.	do.	0	0	2½		—	
Do. do. do. 21 oz. 2nds	do.	0	0	5		—	
Do. do. do. do. 3rds	do.	0	0	3½		—	
Do. do. do. 26 oz. 2nds	do.	0	0	6		—	
Do. do. do. do. 3rds	do.	0	0	4¼		—	
Do. do. do. 32 oz. 2nds	do.	0	0	8		—	
Do. do. do. do. 3rds	do.	0	0	6		—	
Do. English patent plain rolled plate in stock crates ⅛	do.	0	0	2		—	
Cement	per ton	1	12	0		—	
Lime	do.	1	4	0			
Castor Oil, French ...	per cwt.	1	10	0	1	2	0
Colza Oil, English ...	do.	1	13	3		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	15	0	2	17	0
Lead, white, ground, carbonate	per ton	16	0	0		—	
Do. red	do.	15	0	0	19	0	0
Linseed Oil, barrels ...	per cwt.	1	0	0		—	
Petroleum, American ...	per gal.	0	0	6⅜	0	0	6½
Do. Russian ...	do.	0	0	6	0	0	6⅛
Pitch	per barrel	0	9	0		—	
Shellac, orange	per cwt.	10	13	0	10	14	0
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Town	per cwt.	1	12	0		—	
Tar, Stockholm	per barrel	1	5	0		—	
Turpentine	per cwt.	2	9	0		—	

METALS.

		£	s.	d.	£	s.	d.
Standard Copper	per ton	92	10	0	93	0	0
Do. Strong sheets ...	do.	110	0	0	112	0	0
Lead, soft foreign	do.	20	0	0	20	5	0
Do. English	do.	20	10	0	20	12	6
Do. pipes...	do.	23	0	0	23	5	0
Do. sheets	do.	22	5	0	22	10	0
Galvanised Corrugated sheets	do.	12	15	0	13	0	0
Spelter G.M.	do.	24	15	0	25	0	0
Angles, Scotland	do.	6	15	0	6	17	6
Bars, do.	do.	7	15	0	8	0	0
Marked bars, Staffs. ...	do.	8	10	0	8	12	6
Common bars, do. ...	do.	6	7	6	6	10	0
Angles, M'boro.	do.	6	7	6	6	10	0
Joists. M'boro	do.	6	5	0	6	7	6
Angles, Midlands	do.	6	12	6	6	15	0
Joists do.	do.	6	15	0	6	17	6
Girder plates, Midlands ...	do.	7	5	0	7	7	6
Angles, Foreign, c.i.f. Thames	per ton	6	10	0	6	12	6
Tees do. do. do.	do.	6	10	0	6	12	6
Joists, do. do. do.	do.	6	5	0	6	7	6
Channels do. do. do.	do.	6	10	6	6	12	6
Plates do. do. do.	do.	7	5	0	7	7	6
Tin, Foreign	do.	195	5	0	195	15	0
Do. English ingots ...	do.	194	10	0	195	0	0
Zinc, sheets, Silesian, f.o.b.	do.	32	0	0	32	5	0
Do. do. V.M. do.	do.	32	5	0	32	10	0

TIMBER.

		£	s.	d.	£	s.	d.
Deals, Archangel, Yellow, 2nd, 3×11	per std.	15	10	0		—	
Do. do. do. do. 3×9	do.	13	0	0		—	
Do. do. do. 3rd, 3×9	do.	10	0	0		–	
Do. do. White, 2nd, 3×9	do.	10	10	0		—	
Do. Constantza, White, 3rd, 3×11	do.	9	5	0		—	
Do. Gefle, Yellow, Inf. 5th, 3×9	do.	7	0	0		—	
Do. do. do. do. 2½×7	do.	8	0	0		—	
Do. do. do. (dry mixed) 2½×7	do.	12	5	0		—	
Do. Gamleby, Yellow, unsorted, 3×5	do.	8	10	0		—	
Do. do. do. do. 3×4	do.	8	15	0		—	
Do. Hudikswall, Yellow, 3rd, 3×9	do.	13	0	0		—	
Do. do. Yellow & White, 3×9	do.	5	15	0		—	
Do. Keret, Yellow, 3rd, 3×9	do.	10	10	0	10	15	0
Do. do. do. 4th, 3×9	do.	9	0	0	9	5	0
Do. Kem, Yellow (dry). 3rd, 3×9	do.	10	15	0		—	
Do. Kotka, Yellow, unsorted, 3×7	do.	8	15	0		—	
Do. do. do. do. 2½×7	do.	9	0	0		—	
Do. Langrov, Yellow, 5th, 4×9	do.	8	15	0		—	
Do. do. do. do. 3×8	do.	9	0	0		—	
Do. Lulea, Yellow, 2nd, 3×9	do.	9	10	0		—	
Do. do. do. do. 2½×7	do.	9	0	0		—	
Do. Montreal, Yellow Pine, 3rd, 3×11	do.	12	5	0		—	
Do. Nederkalix, Yellow, 1st, 3×9	do.	11	10	0	11	15	0
Do. Räfsö, Yellow, 3rd, 3×7	do.	9	15	0		—	
Do. do. do. do. 2½×7	do.	9	15	0		—	
Do. Skelleftea, Yellow 5th, 3×9	do.	9	0	0		—	
Do. Skutskar, Yellow, 4th, 3×9	do	10	10	0		—	
Do. Wartsala, Yellow, 1st & 2nd, 2½×7	do.	9	5	0		—	
Battens, Archangel, Yellow, unsorted, ¾×6	do.	10	10	0		—	
Do. Arendal, Yellow, unsorted, 2×4	do.	8	15	0	9	0	0
Do. Christainssand, Yellow unsorted, 2×5	do.	8	10	0	8	15	0
Do. Christinestad, White, unsorted, 2×4	do.	8	5	0		—	
Do. do do. 1st and 2nd. 2×4½	do.	9	0	0		—	
Do. Gefle, Yellow, Inf. 5th, 2×9	do.	7	10	0		—	
Do. Koivusaari, Yellow, 1st & 2nd, 2×4½	do.	8	10	0		—	
Do. Kotka, Yellow, unsorted, 2×4½	do.	8	5	0		—	
Do. do. do. do. 2×4	do.	9	5	0		—	
Do. Lulea, Yellow, 1st, 1×9	do.	10	10	0		—	
Do. Mesane, Yellow, 2nd. 2×9	do.	11	0	0		—	
Do. do. do. do. 1½×7	do.	12	0	0		—	
Do. Orefors, Yellow, 1st, 2×9	do.	10	15	0		—	
Do. Skutskav, Yellow, unsorted, 2×5	do.	8	15	0		—	
Do. Sando, White, 1st & 2nd, 2×4	do.	8	15	0		—	
Do. Skelleftea, White, unsorted, 2×4	do.	8	10	0		—	
Do. Wyburg, Yellow, unsorted, 2×4½	do.	8	10	0		—	
Do. do. do. do. 2×4	do.	9	15	0		—	
Flooring Boards Constantza, White, 3rd, 1¼×6	do.	0	8	3		—	
Do. Gefle, Yellow, 1st, 1¼×6	do.	0	14	0		—	
Do. do. do. do. 1×6	do.	0	11	0	0	11	3
Do. do. do. 2nd, 1¼×6	do.	0	13	0		—	
Do. do. do. do. 1×6	do.	0	10	6		—	
Do. Hudikswall, Yellow, 3rd, 1×6½	do.	0	10	3		—	
Do. Johannedal, White, 1st & 2nd, 1×5	do.	0	9	9		—	
Do. Lulea, Yellow, 1st, 1¼×6½	do.	0	12	3		—	
Do. do. do. do. 1¼×6½	do.	0	12	0		—	
Do. do. do. do. 1×6½	do.	0	10	9	0	10	3
Do. do. do. do. 2nd, 1×6½	do.	0	9	6		—	
Do. do. Mon, Yellow, 2nd, 1×6	do.	0	11	0		—	
Do. do. Skonvik, Yellow, 1st, 1×6	do.	0	11	0		—	
Do. do. do. do. 2nd, 1¼×6	do.	0	12	3		—	
Do. do. Sundswall, Yellow, 2nd, 1¼×6	do.	0	13	0		—	
Do. do. do. White unsorted, 1×6	do.	0	10	0		—	
Do. Swartwik, Yellow, 3rd, 1×6½	do.	0	9	6		—	

Builders' Current Price List of Specialities

This list is not intended to promote undercutting, and prices are subject to discounts for a quantity and for cash. Readers are advised to write for these discounts. Where prices for goods are standardised and fluctuation takes place in trade discounts, our prices have the discounts deducted. In some cases it is difficult for firms to quote prices, and we have stated where they will be pleased to send catalogues and quotations immediately on receipt of applications.

Goods.	Description.	Merchants or Manufacturers.	Address.	Size.	Weight.	Quantity. per	Price		
							On Rail.	Dlvrd. at London Termini.	Dlvrd. to Buyer
Baths:									
Iron	Rolled edge, white vitreous enamelled	Doulton and Co., Ltd.	Lambeth, London	5ft. 6in. inside	—	each	£4 7s. 6d.	—	—
Bathroom Suites	Complete as advertised	Standard Sanitary Manufacturing Co.	22, Holborn Viaduct, London	—	—	—	—	—	£18 18s.
Blinds:									
"Japa"	Sanitary	Japa Blinds, Ltd.	55, Barbican, London, E.C.	All sizes	72 long 36 wide	—	—	2s. 6d. to 16s. doz.	Free.
Boilers:									
Saville	Wrought-iron for hot-water heating and supply	Hartley & Sugden, Ltd.	Halifax	30×13 to 72×30	3 cwt. to 17 cwt.	each	£9 5s. to £52	Free in Great Britain.	
Bricks:									
Facing	Blue and brindled	G. Woolliscroft & Sons, Ltd.	Hanley, Staffs.	9×4½×3	3·75 tons	1000	35s. to 37s. 6d.	£4 3s. to £3 5s. 6d.	—
Facing	Red terra-cotta	G. Woolliscroft & Sons, Ltd.	Hanley, Staffs.	9×4½×3	3·75 tons	1000	£2 10s.	£3 18s.	—
Casements and Sashes:									
Metal Casements	Iron, steel, and bronze	George Wragge, Ltd.	London and Manchester	Registered sections	—	each	From 15s.	16s.	—
Metal Sashes	Ditto	Ditto	Ditto	Ditto	—	ft. super.	From 6d.	—	—
Castings:									
Iron	Plain and Ornamental	Walter Macfarlane & Co.	Saracen Foundry, Glasgow	—	—	—	Prices on application.		
Cement, Lime, &c.:									
Cement	Portland	Associated Portland Cement Mnfrs. (1900), Ltd.	Dixon House, 72, Fenchurch Street, E.C.	—	—	—	Prices on application.		
Lime	——	Associated Portland Cement Mnfrs. (1900), Ltd.	Dixon House, 72, Fenchurch Street, E.C.	—	—	—	Prices on application.		
Chimney-Pieces:									
Marble	——	J. & H. Patteson	7, Bayley Street, Bedford Sq., London, and Oxford Street, Manchester	—	—	—	Prices on application.		
Chimney Pots	"Notlor" patent self-flanching and weathering	Notley & Taylor	Finsbury Pavement House, E.C.	9×9 and 14×9 flues	—	—	—	From 3s. 6d.	—
Closets:									
Cisterns, Seats, &c.	For houses	Adamsez, Ltd.	Scotswood-on-Tyne	—	—	set with fittings.	£2 to £10	—	—
Latrines	For schools and workmen	Adamsez, Ltd.	Scotswood-on-Tone	—	—	stall	30s. to 70s.	—	—
"Simplicitas"	——	Doulton & Co., Ltd.	Lambeth, London	—	—	each	£1 15s.	—	—
Columns	Cast-iron	Measures Bros., Ltd.	53B, Southwark Street, London, S.E.	stock patterns	—	ton	£7	£7	—
Compoboard	Swedish	Messers, Ltd.	79½, Gracechurch Street, E.C.	4ft.×8 to 18ft.×⅜in. and ½in.	1 ton	2,000ft. super.	Prices on application.		
Concrete:									
Armoured	Floors and roofs	Trussed Concrete Steel Co.	Caxton House, Westminster	—	—	sq. yard	—	—	8s.*
Reinforced	Entire buildings, foundations, reservoirs, &c.	Stuart's Granolithic Stone Co., Ltd.	Glengall Road, Millwall, E.	—	—	—	Prices on application.		
Door Furniture:									
Door Springs	With silent check	Robert Adams (patentee)	3 & 5 Emerald Street, London, W.C.	For medium doors	—	each	D.A. 46s. S.A. 42s.	D.A. 46s. S.A. 42s.	—
Elevators:									
"Otis"	Electric and hydraulic	Otis Elevator Co. Ltd.	4, Queen Victoria Street, London	—	—	—	Prices on application.		
Enamels:									
"Sanalene"	Pure white or colours	Aspinall's Enamel, Ltd.	New Cross, London	—	—	gallon	—	—	18s.
Faience:									
White and coloured	For elevations	Alfred Whitehead	Prudential Build'gs, Leeds	—	—	sq. yard	74s. 6d.	79s.	—
Fans:									
Fans, Blowers, and Motors	Belt, electric or steam driven	Matthews & Yates, Ltd.	Cyclone Works, Swinton, Manchester	All sizes	—	—	Prices on application.		
Felt:									
Ruberoid Sacking Felt	High-grade inodorous felt	Ruberoid Co., Ltd.	81 & 83, Knightrider St., London, E.C.	36×72	44lbs.	roll, 24sq. yds.	—	—	13s. 6d.
Fencing:									
Iron	"Greenhill" patent automatic railing	Hill & Smith	Brierley Hill Iron Works, Staffs.	3½ft. high ⅝ verticals	40lbs. yard	yard	4s. 5d.	4s. 9d.	—
Fireproofing (See also Partitions):									
Terrawode Brickwood	Fireproof floors	Jabez Thompson & Sons	Northwich, Cheshire	4ins. thick	—	sq. yard	6s.	7s.	—
Columbian	Reinforced concrete floors and roofs	Columbian Fireproofing Co.	37, King William Street, London	—	—	—	Prices on application.		
Expanded Steel	Reinforcement for every description of concrete work	New Expanded Metal Co.	York Mansion, York, St., Westminster, S.W.	Up to 16ft. ×8ft.	2lbs to 30 lbs.	sq. yard	5d. to 4s. 9d.	Price list on application.	
Floors and Roofs	Steel concrete	Homan & Rodgers	17, Gracechurch Street	—	—	sq. yard	—	—	7s.*
Floors and Roofs	Reinforced concrete	Trussed Concrete Steel Co.	Caxton House, Westminster	—	—	sq. yard	—	—	8s.*
Floors and Roofs	Reinforced concrete	Stuart's Granolithic Stone Co., Ltd.	Glengall Road, Millwall, E.	—	—	sq. yard	Prices on application.		
Floors:									
Columbian	Concrete fireproof floors and roofs	Columbian Fireproofing Co.	37, King William Street, London	—	—	—	Prices on application.		

* Erected.

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Builders' Current Price-List of Specialities—*(continued)*.

Goods.	Description.	Merchants or Manufacturers.	Address.	Size.	Weight.	Quantity per	Price. On Rail.	Price. Dlvrd. at London Termini.	Price. Dlvrd. to Buyer.
Galvanised Iron:									
Sheets	Corrugated	Baldwins, Ltd.	5, Fenchurch St., London, E.C.	5ft. to 9 ft. × 2ft. × 22 or 24 G.	—	ton	—	£14 10s.	—
Sheets	Flat	Baldwins, Ltd.	5, Fenchurch St., London, E.C.	72 × 24 to 36 × 20 or 24 G.	—	ton	—	£15	—
Buildings	Of every description	Baldwins, Ltd.	5, Fenchurch St., London, E.C.	—	—	—	Prices	on application.	
Gas Generators:									
Acetylene	Five-light portable	Strode & Co.	48, Osnaburgh Street, London.	15ins. diameter, 24ins. high.	—	each	—	£3	—
Glass:									
Stained & Embossed	Leaded lights, embossed and brilliant cut-glass	Young & Martin, Ltd.	Stratford, E.	—	—	—	Prices	on application.	
Stained	Memorial & other windows	E. E. Oldacre & Co.	Stirling Place, Hove	—	—	ft. super.	Prices	on application.	
Guards, Wire:									
Straight Lattice	Half mesh	Richard Johnson, Clapham, & Morris, Ltd.	Manchester	6ft. × 3ft.	14lbs.	sq. ft.	5d.	5½d.	5¾d.
Joinery:									
Panelling	High-class 1-in. Austrian oak panelling.	Elliott's Moulding & Joinery Co., Ltd.	Newbury	3ft. to 7ft. high.	ft. super.	2s.	2s. 1d.	—	—
Joists:									
• Steel	Broad flange beams	H. J. Skelton & Co.	71, Finsbury Pavement, London, E.C.	—	—	ton	—	£6 18s.	—
Steel	English and foreign	Columbian Fireproofing Co.	37, King William Street London.	—	—	—	Prices	on application.	
Steel	Belgian and German	Measures Bros., Ltd.	53B, Southwark Street, London, S.E.	3 to 20 deep	—	ton	£6 17s. 5d. basis sections.	£6 17s. 6d. basis sections.	—
Laundry Machinery:									
Finishing Machines	For Shirts, Collars, & Cuffs	W. Summerscales & Sons, Ltd.	Keighley, Yorks	12ins. to 42ins.	—	each	£30 to £50	£30 10s. to £51 10s.	—
Lavatories:									
Glazed Ware	For schools, workmen, and private houses.	Adamsez, Ltd.	Scotswood-on-Tyne	—	—	set, with fittings	£1 10s. to £4	—	—
Leaded Lights	All descriptions	E. E. Oldacre & Co.	Stirling Place, Hove	—	—	ft. super.	Prices	on application.	
Lifts:									
Electric	All other types	A. Smith & Stevens	Battersea, London	All sizes.	All weights.	—	Prices	on application.	
Hand-power	All kinds, for all purposes	George Johnson	227, St. John's Hill, London, S.W.	—	—	—	Prices	on application.	
"The Premier"	Dinner and service lift to raise ¾ cwt.	The Lift & Hoist Co.	Premier Iron Works, Prince Street, Deptford, S.E.	Cage *inside* 2ft. wide, 1ft. 6 deep. 2ft. 6 high.	—	—	—	£9 10s.	—
Lighting and Heating:	Electric light and gas-fittings, &c.	Young & Marten, Ltd.	Stratford, E.	—	—	—	Prices	on application.	
Lightning Conductors	Copper tape	Joseph Lewis	5 & 6, Great Winchester Street, London, E.C.	¾ × ⅛ and upwards.	—	foot run	from 1s.	—	—
Locks:									
Kaye's Patent	Four lever mortice, iron and brass.	Joseph Kaye & Sons, Ltd.	93, High Holborn, London, W.C.	—	—	each	—	—	7s. 6d. 10s. 6d
"C. and B."	Registered mortice Nos. 1, 2, and 3.	Colledge & Bridgen	Midland Works, Wolverhampton.	6 inch.	—	dozen	—	—	£3 6s. £2. 5s. £1 9s.
Marble, Mosaic, and Stone Work:									
Glass Mosaic	Coloured art	The Cloisonné Glass Co.	40, Berners Street, W.	—	—	sq. ft.	—	From 3s. upwards.	—
	Plain or design	J. & H. Patteson	7, Bayley Street, Bedford Square, London, and Oxford Street, Manchester.	—	—	—	Prices	on application.	
Motor Wagons	Steam	St. Pancras Ironworks Co. Ltd.	171, St. Pancras Road, London, N.W.	—	4 tons 19 cwt.	each	—	From £530.	—
Paint:									
Anti-corrosive, &c.	"Bitumastic" solution and enamel	Wailes, Dove & Co., Ltd.	Newcastle-on-Tyne, London, Liverpool, Cardiff, Birmingham, and Glasgow	—	—	—	Prices	on application.	
Partitions:									
Partitions	"Kulm" slabs	H. W. Cullum & Co.	Craven House, Kingsway, London, W.C.	—	—	sq. yard	Prices	on application.	
Patent Plaster	Hollow interlocking blocks	Havelock Patent Plaster Partition Co.	63, Finsbury Pavement, E.C.	29 × 17	70lbs.	super. yard.	3s. 6d.	4s. 6d.	6s.
Plaster	Partition slabs	Jabez Thompson & Sons	Northwich, Cheshire	12 × 12 × 2	—	sq. yard	3s. 6d.	4s.	—
Porous Brick	Porous terra-cotta blocks	Hempstead Patent Brick Co.	Hemel Hempstead	9 × 12 × 1½	—	sq. yard	2s.	2s. 4d.	—
Terrawode Brickwood	Partition bricks	Jabez Thompson & Sons	Northwich, Cheshire	9 × 4½ × 3	2 tons	1000 sq. ft.	£3 5s.	£4 9s.	—
School	——	John Stones	"Rosside," Ulverston	—	—	—	Prices	on application.	
Pavement:									
Lights	Prismatic	St. Pancras Ironworks Co.,	171, St. Pancras Road, London, N.W.	—	—	per ft. super.	—	From 4s. 6d.	—
Concrete	"Granolithic"	Stuart's Granolithic Stone Co., Ltd.	Glengall Road, Millwall, E.	—	—	—	Prices	on application	
Photo Prints, Copies, &c.:									
"True to scale"	(Dorel system)	W. F. Stanley & Co., Ltd.	13, Railway Approach, London Bridge, S.E.	Imperial	—	2 copies	—	—	2s. 3d. p. free
True scale	Dorel and photo-litho methods	Vincent, Brooks, Day & Son, Ltd.	48, Parker Street, Kingsway, London, W.C.	—	—	—	Prices	on application	
All Kinds	On any material	London Drawing and Tracing Office.	98, Gray's Inn Road	—	—	—	Prices	on application.	

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Builders' Current Price-List of Specialities—*(continued).*

Goods.	Description.	Merchants or Manufacturers.	Address.	Size.	Weight	Quantity. per	Price.		
							On Rail,	Dlvrd. at London Termini.	Dlvrd. to Buyr.
Pipes:									
Columbian	Armoured cement for water and sewage conveyance	Columbian Fireproofing Co.	37, King William Street, London	—	—	—	Prices on application.		
Iron Soil	Large assortment of fittings stocked	Burn Brothers	Rotunda Works, 3, Blackfriars Rd., London, S.E.	2ins. to 6ins.	L.C.C. & heavy	—	Prices on application.		
Pipe joint paste	"Wisconsin" Graphite	G. F. Hopkins & Co	112, Westminster Bridge Road, London, S.E.	—	—	1 lb. to 60 lbs.	1s. 1d. to 6½d.	—	—
Plaster:									
Fibrous, &c.	For relief decoration	G. & A. Brown, Ltd.	167, Hammersmith Road, W.	—	—	—	Prices on application.		
Keene's & Parian	——	Associated Portland Cement Mnfrs. (1900), Ltd.	Dixon House, 72, Fenchurch Street, E.C.	—	—	—	Prices on application.		
"Pytho"	For interior plastering	Plaster, Brick, and Stone Co., Ltd.	Wall Grange, near Leek, Staffs.	—	1 ton	—	37s. 6d.	42s. 2d.	—
Rainwater Heads and Pipes:									
Rainwater Heads	Cast lead and iron	George Wragge, Ltd.	London and Manchester	stock designs	—	each	From 16s. 6d.	17s. 6d.	—
Roofs:									
Ruberoid Roofing	High-grade prepared roofing	Ruberoid Co., Ltd.	81 & 83, Knightrider St., London, E.C.	36×72	40lbs. to 100lbs.	216 sq. ft.	—	½ ply, 17s. 4d.; 2 ply, £1 6s. 6d.	1 ply, 20s. 6d.; 3 ply, 34r. 6d.
Steel	Principals and corrugated iron	E. F. Blakeley & Co.	Vauxhall Ironworks, Liverpool	—	—	ft. super.	—	From 6d. upwards.*	—
Sanitary:									
Engineers' Appliances	Baths, lavatories, closets, pipes, cisterns, pumps, &c.	Young & Marten, Ltd.	Stratford, E.	—	—	—	Prices on application.		
Syphons and Tanks	Automatic flushing	Adamsez, Ltd.	Scotswood-on-Tyne	—	—	each	£1 to £3	—	—
Waste Preventers	"Paisley," painted	Doulton & Co., Ltd.	Lambeth, London	2 gallon	—	each	£1 3s. 6d.	—	—
Waste Preventers	"Well," painted	Doulton & Co., Ltd.	Lambeth, London	2 gallon	—	each	16s.	—	—
Scaffolding:									
Putlogs	Hewn birch	Vigers Bros.	67-68, King William Street, E.C.	—	—	dozen	5s. 3d. in docks	—	—
Shutters:									
Revolving	No. 7 convex wood lath	Clark, Bunnett & Co., Ltd.	New Cross Road, London, S.E.	—	—	ft. super.	1s. 6d.	—	—
Sinks:									
Glazed Ware	"Krator," "Helios," "Belfast," and "Edinburgh"	Adamsez, Ltd.	Scotswood-on-Tyne	—	—	each	10s. to £5	—	—
Slates and Slating:									
"Arfon" Slates	Unfading green	Pearson Bros. & Campbell	18, Water St., Liverpool	—	—	—	Prices on application.		
Buttermere or Cumberland & Westmoreland Green Slates	Light sea green, olive, and dark	Buttermere Green Slate and Stone Works	Keswick	30 to 12 long	—	ton	£4 5s.	£5	—
Slating and Tiling	All kinds — green slating speciality	Roberts, Adlard & Co.	London, Faversham, Brighton, &c.	as required	—	1 000	Prices on application		
Slates and Slating	Portmadoc, French, and American	Young & Marten, Ltd.	Stratford, E.	—	—	—	Prices on application		
Sound-Proofing:									
Deafening Quilt	Cabots' double ply	Arthur L. Gibson & Co.	19/21, Tower St., Upper St. Martin's Lane, London, W.C.	—	120 lbs.	bale, 500 sq. ft.	36s. 6d.	—	—
Springs:									
Door Checks	"Blount"	Charles Winn & Co.	Birmingham	—	—	—	Prices on application		
Stable:									
Paving	"Granolithic"	Stuart's Granolithic Stone Co., Ltd.	Glengall Rd., Millwall, E.	—	—	—	Prices on application		
Staircases:									
Concrete	Fire-resisting	Stuart's Granolithic Stone Co., Ltd.	Glengall Rd., Millwall, E.	—	—	—	Prices on application		
Spiral	——	St. Pancras Ironworks Co., Ltd.	171, St. Pancras Road, London, N.W.	From 3ft. 6ins. diam.	—	per ft. rise	—	From 13s.	—
Stone:									
Artificial	"Granolithic"	Stuart's Granolithic Stone Co., Ltd.	Glengall Rd., Millwall. E.	—	—	—	Prices on application		
Bramley Fall	Sandstone, light and grey	B. Whitaker & Sons, Ltd.	Horsforth, near Leeds	any sizes	14ft. to 1 ton	cube ft.	10d.	1s. 9d.	—
Granite	Architectural and monumental	Kirkpatrick Brothers	Trafford Park, Manchester	—	—	—	Prices on application		
Dark-Bed Hopton Wood	Hard limestone, colour grey	J. Hodson & Son, Ltd.	Nottingham	random blocks	—	foot cube	1s. 2d.	2s.	—
Yorkshire	Sandstone, various colours	J. Hodson & Son, Ltd.	Nottingham	random slabs	14ft. cube to ton	foot cube	From 2s.	From 2s. 10d.	From 3s.
Terra-cotta:									
Window Heads	Buff or red	Walwyn T. Chapman	Cleethorpes	3×9 4½×10	1 cwt.	each	5s.	—	—
Tiles:									
Coloured Enamelled	Best quality in brown, blue, green, &c.	Carter & Co.	Encaustic Tile Works, Poole.	usual sizes	1 ton	55 yds. sup.	10s. 6d. per yd.	11s. per yd. sup.	11s. 2d. per yd.
Tessellated	Best quality any plain pattern	Carter & Co.	Encaustic Tile Works, Poole.	usual sizes	2 tons	80 yds. sup.	5s. per yd. sup.	5s. 4d. per yd.	5s. 6d. per yd.
Decorative	Floor	Craven, Dunnill & Co., Ltd.	Jackfield, R.S.O., Shropshire	every size	56 lbs.	sq. yard	from 3s. 6d.	4s. 6d.	4s. 6d.
Ditto	Wall	Craven, Dunnill & Co., Ltd.	Jackfield, R.S.O., Shropshire	—	40 lbs.	—	from 5s. 6d.	6s. 4d.	6s. 4d.
Ditto	Mosaic	Craven, Dunnill & Co., Ltd.	Jackfield, R.S.O., Shropshire	—	48 lbs.	—	from 13s. 9d.	15s.	15s.
Ditto	Faience	Craven, Dunnill & Co., Ltd.	Jackfield: R.S.O., Shropshire	—	170 lbs.	—	from £1 3s.	£1 5s.	£1 5s.
"Opalite"	Opal glass, with Shelmerdine backing	Wm. Griffiths	126, Hamilton Ho., Bishopsgate St., Without, E.C.	9×3 and 6×6	—	sq. yard	—	—	10s. 6d.†
Wall	Patent undercut back	T. & R. Boote, Ltd.	Burslem	6×6	50 lbs.	sq. yard	6s.	6s. 6d.	6s. 9d.‡
"Durolite"	Glass tiles, with patent fire-proof backing to prevent surface cracking	Durolite Ltd.	36, Camomile Street, London, E.C., and St. Helens, Lancashire	white and tinted 6×6 and 9×3 marbled 12×6	—	sq. yard	—	—	white† 10s. 0d. tinted† 11s. 6d. mrbls.† 12s. 6d.
Timber:									
Planks	Dry Mahogany and Oak	James W. Southern & Son	Store Street Saw Mills, Manchester.	—	—	—	—	—	—
Tracing Cloth:									
"Ivorine"	Pure white	Norton & Gregory, Ltd.	Castle Lane, Westminster	30ins. × 24yds.	—	roll	—	—	22s. 6d.
"Koh-i-noor"	——	L. & C. Hardmuth	12, Golden Lane, London, E.C.	30, 36, 40, 42	—	roll of 24 yds.	Prices on application.		
"Triumph" Brand	Blue	Norton & Gregory, Ltd.	Castle Lane, Westminster	30ins. × 20yds.	—	roll	—	—	12s. 6d
Urinals:									
Glazed Ware	Circular slab and T-backs	Adamsez, Ltd.	Scotswood-on-Tyne	—	—	stall, with fittings	£3 to £15	—	—
Ventilators:									
Boyle's Patent	Latest "air-pump" ventilators (design No. 175)	Robert Boyle & Son	London and Glasgow	12ins. to 54ins. diam.	—	each	—	—	25s. to £18 18s.

* Erected. † Approximate price fixed, complete, in London. ‡ Executed.

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The Grand Manner. On many occasions the subject of street planning and the design of buildings in city streets has been dealt with at congresses of architects, and we do not propose now to refer to the aspect of it which is customarily discussed. The general press has at various times interested itself in the subject, and the "Tribune" has, within the past week, done good service by interviewing well-known architects. Mr. Norman Shaw and Mr. Reginald Blomfield have touched upon the most important quality in the planning of buildings in cities. In the words of Mr. Norman Shaw, "What we want is stateliness—stateliness for an Imperial city. And we shall never do it without a plan, a big, comprehensive plan. Let me tell you how the French do it. In the first place they consult the artists, the people who know. The broad idea of a boulevard or a great street is laid out. It may be a hundred years before it is finished, but the idea runs constantly on. In a dirty little street you come across three or four fine new houses, well set back from the road, and you wonder by what freak they came there. You return in a few years and you find a few more, hundreds of yards away. Then you discover that they are all part of a scheme for a great avenue of the future, an avenue, it may be, half a mile long. We never, by any accident, do that. That is plan, the thing we have not got." Mr. Blomfield's way of expressing the same thing is as follows: "What we have to do in England is to build up a sense of the 'big manner.' It does not exist, and without it you can never make a noble city." Mr. Blomfield has said somewhat the same thing before. He has the reputation of being a Classicist and, in speaking of the grand manner, he probably would limit the expression generally to Renaissance design. Mr. T. G. Jackson points out, however, that the Gothic builders in the Middle Ages realised the importance of regular and symmetrical planning in the lay-out of new towns. He says the irregular street that comes by accident, with undesigned picturesque effects, is, perhaps, the most delightful of all to an artist, but then it must be accidental and undesigned. We are at one, however, with Mr. Blomfield in thinking that, as he puts it, the big manner is required in designing buildings as well as planning cities. We have had too much of the picturesqueness that Mr. Jackson seems to consider so delightful. Picturesqueness serves well enough in a small town, but when one gets to a large city regular planning calls for symmetrical design, massing, and largeness of scale. Mr. Blomfield, in referring to Mr. Norman Shaw's design for the Quadrant in Regent Street, says he "has set us a fine line to follow, though his scale is possibly too magnificent for any of us." The views illustrating the paper on the architecture of the Roman Empire read last Friday evening before the Architectural Association (see page 203 of this issue) might be cited as strikingly emphasising the importance of this "big manner." Even Mr. Norman Shaw's work, which to Mr. Blomfield seems too great in scale, is puny beside that of the Romans. Of course, in the past, architecture was a popular art and the people took a pride in fine buildings and did not mind the expense, which, in this commercial age, is always foremost. But of late we have witnessed an increase in public-spirited endeavours to improve matters, and it is to be hoped that architects will cultivate the grand manner so as to be able to deal with great opportunities when they arise.

Adding a Shelter to Birmingham Town Hall. We notice that several letters have recently appeared in the correspondence columns of the "Birmingham Daily Mail" suggesting the erection of a permanent covered way round the Town Hall. This proposal, we are assured, crops up triennially at the time of the Musical Festival, being suggested by the unsightliness of the temporary wooden structure which is erected on such occasions, and the general recognition of the discomfort and inconvenience which is suffered by those who attend concerts at the Town Hall on any other occasion when it happens to be wet, the only shelter to be had being that afforded by the arcade at the front entrance. The Birmingham Town Hall is a severely classic building, a massive structure; and, of course, the idea of a shelter around it is disquieting—even assuming that there was no chance of the "graceful iron structure" making its appearance. However, whether a shelter will ever be erected or not, the suggestion has an interesting general application. The problem is obviously a difficult one, and we regret that architects should so frequently shirk it, with the result (as we see, for example, at hotel entrances especially) that the ironwork provider comes in after the architect has finished his part of the work, and very quickly there arrives that familiar affair of scrolls and glass which spoils the building. Architects would serve their interests best, therefore, if they took the trouble to design these shelters or awnings in the first place. In connection with the Birmingham proposal, Mr. Bidlake has observed that an iron and glass enclosure round the Town Hall would be an abomination, though if the Town Council dealt with the matter they would probably go in for a covered way of that sort. He could believe it possible to make the Town Hall architecturally correct with a colonnade round it, but the great problem was to prevent the dwarfing of the main building. The only way would be to get a model made to try the effect and have it popularly exhibited. The error was made when the Town Hall was built. "The simplest way of meeting the requirements now, I should imagine, would be to carry the arcade along the sides, but when that is done it will emphasise the weakest part of the design, and even then it is a question whether, with such tall arches, sufficient protection would be afforded from the weather."

A.A. OF IRELAND.

President's Address.

At the annual meeting of the Architectural Association of Ireland, held in Dublin last week, the newly-elected president, Mr. Joseph Holloway, delivered his inaugural address. His theme was Irish architecture and Irish materials. Mr. Holloway urged architects in Ireland to use Irish stones, bricks, slate, &c., when and where they could, for it stood to reason that the materials of a country were the best and most suited for buildings in that country. How characteristic were the homes, in the different counties of England, of the locality in which they were reared. They seemed part of the place, grown naturally out of their surroundings. But the Irish climate was a damp one, and the half-timbered houses recently erected around Dublin were not at all suitable on that account at least, however much they were "at home" in the rural districts of England or in the suburbs of English towns. Let them study the best examples in their own country, and try to improve upon them on their own lines.

In Ireland the simple-minded might imagine that there was good granite enough and to spare (what with Dalkey, Newry and Galway granites, to mention a few), yet some architects must rush to Belgium or Aberdeen for granite. The thing was a farce. The cry was that Irish granite could not be got to time; yet he had been credibly informed that a certain job in Dublin had been delayed for more than three months waiting for the foreign material to arrive.

Did it ever strike them that

all Irish architects should be Home Rulers

when they thought of what was accomplished before the Union in the way of architecture in Dublin? All (or nearly all) the fine old buildings in the city of which they were so proud were erected during the sitting of the Irish Parliament in College Green, and why not again? He strongly recommended that their young architects should sketch the fine old doorways, railings, &c., that abounded in Merrion Square, Fitzwilliam Square, Stephen's Green, and in many of the streets on the north side of the city. They were all well worthy of study.

Mr. Norman Shaw had said that he saw energy everywhere in the architectural profession in England, that architects were working nowadays in what he thought the right direction towards evolving a characteristic modern English style, in domestic work at any rate. Why did Irish architects not try to do the same, and evolve an Irish style of architecture, based on their own climate, their own materials, their own ways of life, and their own landscape, instead of persisting in weak copies of English work? A lustier style was required than the tasty-looking, fragile Swiss cottage types (as half-timbered work was invariably called by the lay critic) that architects were causing to be erected round the city.

Extensive Alterations to the Cutlers' Hall, Sheffield, have been carried out under the direction of Mr. A. E. Turnell, architect, of Sheffield. The principal object of the scheme has been to provide an improved entrance to the Lower Hall, and to give better cloakroom and lavatory accommodation. The alterations have been carried out by Messrs. Ash, Son & Biggin, of Sheffield, and the lavatories have been fitted by Messrs. Doulton & Co.

PRACTICAL NOTES FOR ARCHITECTURAL DRAUGHTSMEN.

By Alfred W. S. Cross, M.A., F.R.I.B.A., and Alan E. Munby, M.A.

THE ORDERS AND THEIR APPLICATION.

(Continued from p. 158, No. 608.)

Plate IV.

In dealing with the applications of the Orders to buildings involving the spacing of the columns and the size and arrangement of apertures it is not desirable, nor, indeed, possible, to lay down rules for dimensions in the manner which has been attempted for the Orders themselves; for the elevation of a building must always be subservient to the plan in all but purely ornamental structures, and plans of buildings admit of no generalisations.

The relations and dimensions given in this and similar subsequent plates must, therefore, be looked upon as necessarily somewhat elastic. At the same time, such dimensions as are given should not be disregarded, but considered in the light of proportions to be attained as far as the exigencies of the plan will admit.

The spacing of arcading dealt with in this plate should be governed by the height of the space to be treated, and it will be found that the best effects are obtained when the widths of the openings approximate to half of their height, and when the total width of the piers lies between one-half and two-thirds of that of the opening.

The spacing must also be considered in reference to the Order employed, so that when triglyphs, or modillions, are placed centrally over the columns their proper spacing may be interfered with as little as possible. It will thus be seen that a relation exists between the diameter of the column, the width of the pilaster, and the width of the opening. Again, the diameter of the column relatively to the opening will be influenced by the presence, or absence, of a pedestal to the Order. The following summary collected from Gibbs's work, giving the dimensions to be aimed at in order to comply with the above relations, will be found useful :—

Diameter of Column = 1.

	Tuscan.		Doric.		Ionic.		Corinthian.	
	No Pedestal	With Ped.	No Ped.	With Ped.	No Ped.	With Ped.	No Ped.	With Ped.
Width of bay centre to centre	6	7	$6\frac{1}{4}$	$7\frac{1}{2}$	6	$7\frac{1}{2}$	$6\frac{5}{12}$	$8\frac{1}{6}$
Width of one pilaster	$\frac{1}{2}$	$\frac{2}{3}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{9}{16}$	$\frac{7}{10}$
Width of opening	4	$4\frac{2}{3}$	$4\frac{1}{4}$	$5\frac{1}{4}$	4	$5\frac{1}{4}$	$4\frac{1}{3}$	$5\frac{3}{5}$

The height of the impost should always be about two-thirds of the height from the ground to the soffit of the architrave of the Order, whether a pedestal is in use or not. The impost may be a mere block or string, or a cap as represented. The arch above is semicircular in form, and should spring from the top of the impost, unless the point of observation is considerably below it, as in storeyed buildings, when it should be slightly stilted in order that the whole of the curve may be seen.

The archivolt or moulding running round the arch should be the same width as the pilaster (less any necessary clearance for the mouldings)—that is, about one-eighth of the width of the opening, which should also be the height of the impost cap to the bottom of the necking. Further details as to the members will be found on Plate V.

Unless the arch is a very small one, a keystone should be always provided. Its width at the bottom should be equal to the width of the archivolt and its sides parts of radii of the arch, while its length should be one and a half to twice its breadth at the bottom. If no keystone is used, the archivolt should still be kept below the architrave of the Order to about the same extent. The thickness of the piers, from back to front, must naturally be governed by constructional considerations; but as regards appearance they should be one-quarter to one-third of the width of the opening. Angle piers should be wider than the rest, to give real and apparent strength; they may be even half as wide again as those of the general façade.

These rules as to the width of archivolts and pilasters may be considerably varied, in the direction of increased dimensions, when columns and other features, which otherwise would be thrown out of scale, are absent.

Plate V.

Impost Mouldings.

Details are here given of impost mouldings, with their archivolts, suitable for the different Orders. The divisions of the imposts are all simple and similar in each example, the height of the corona and of its mouldings above, if any, being equal to the height of the mouldings below, which, again, are equal to the necking. The bead and fillet below the necking are one-sixth of the height of the impost, the bead being double the height of the fillet. The projection of the impost beyond the line of the pilaster is equal to the height of the corona and member over in the first two Orders, while the projection of the corona itself is equal to this height in the last two.

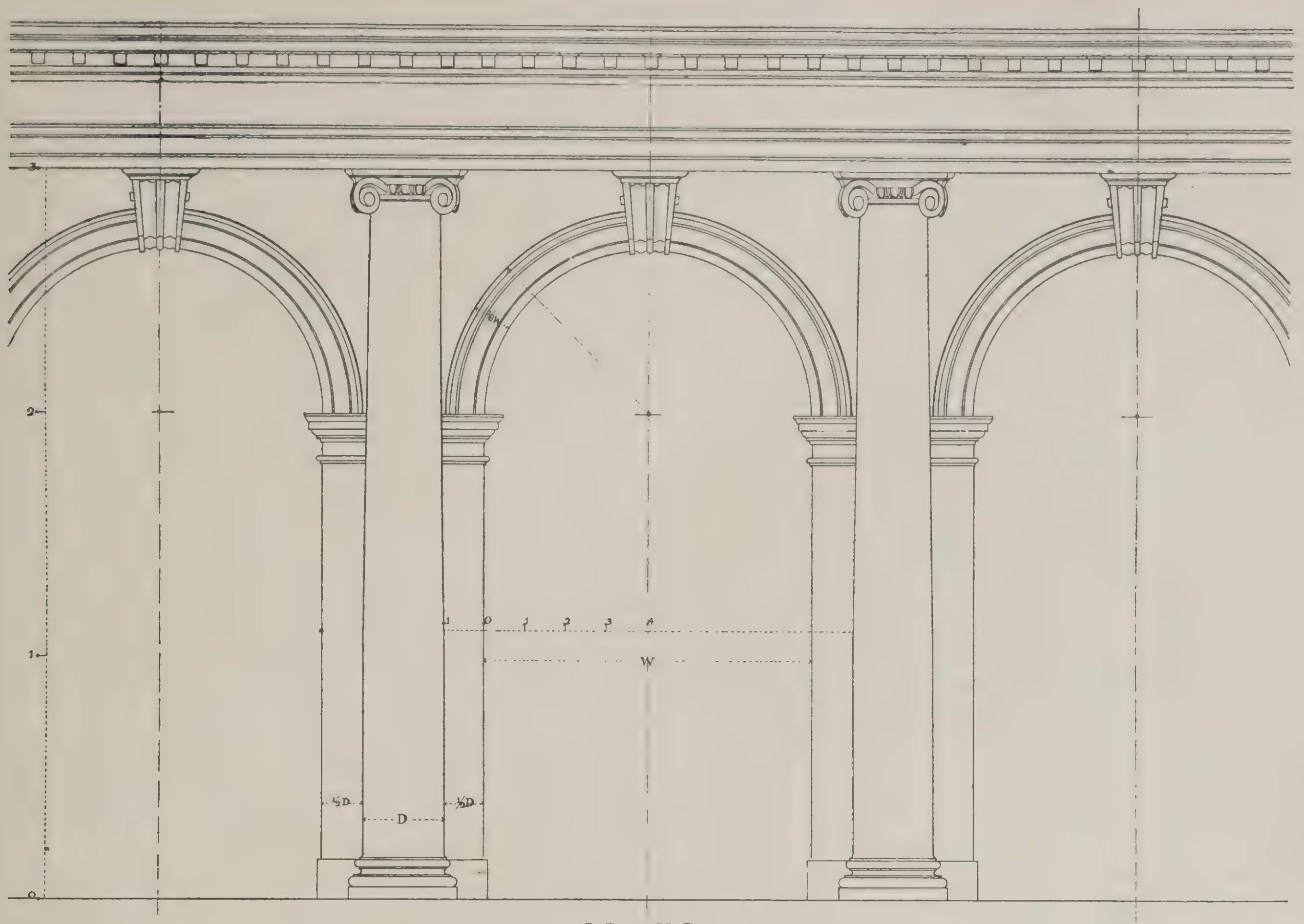
The pilaster is square on plan, and, therefore, the plan of the archivolt is represented by this square upon which the mouldings are placed. An examination of these mouldings will show that they resemble the architraves given for their respective Orders, and their forms admit of similar variations. It will be noticed that the innermost face is always in the plane of the face of the pilaster, while the projection of the moulding at the extrados increases from about one-quarter the width of the whole archivolt in the Tuscan to one-third in the Corinthian Order.

(To be continued.)

A Correction.—On p. 156 of our issue for October 3rd read "base" for "shaft" in the last line of the description of the Doric Order, Plate II.

EXAMPLES OF ARCADING

PLATE. 4.



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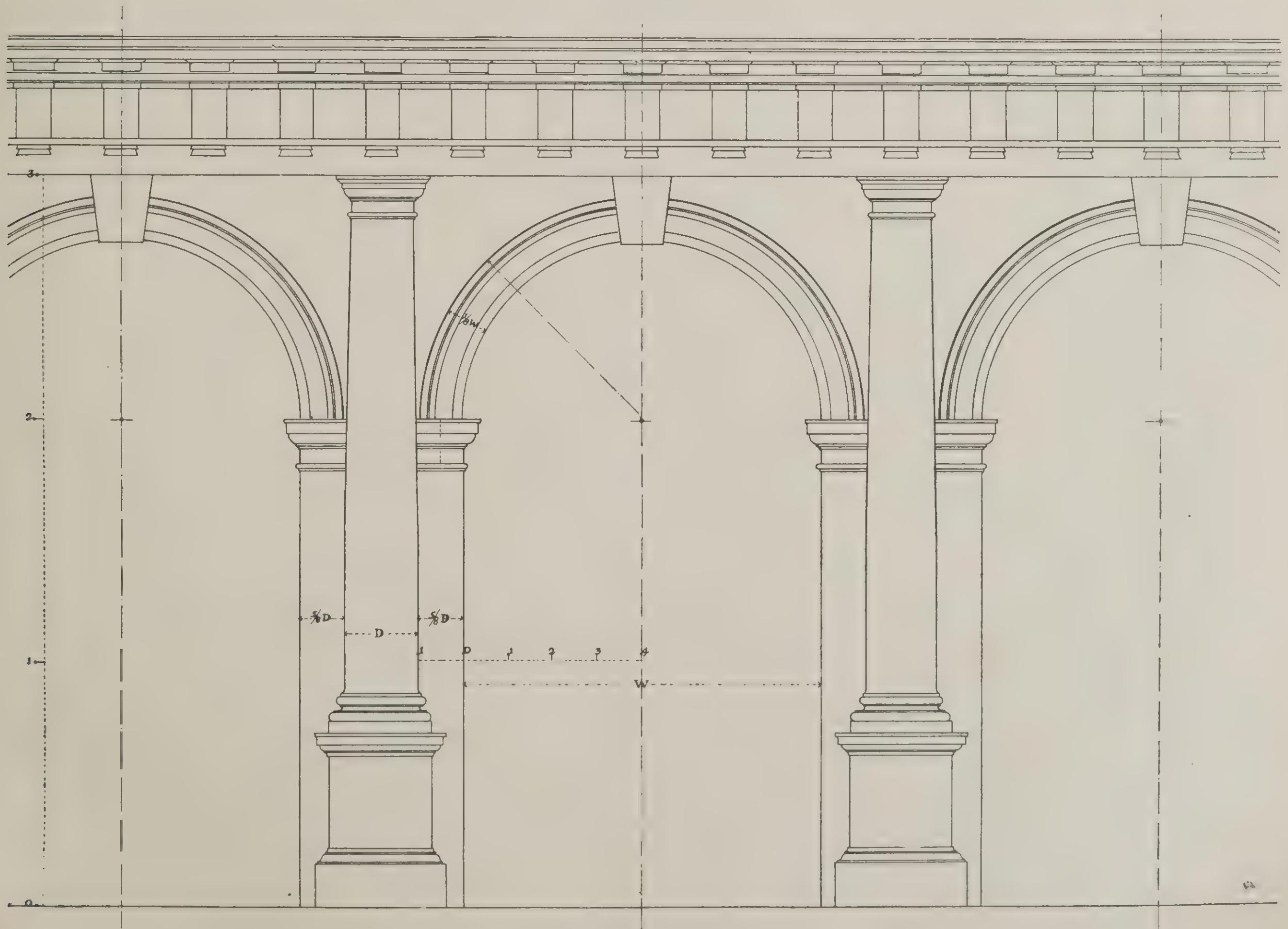
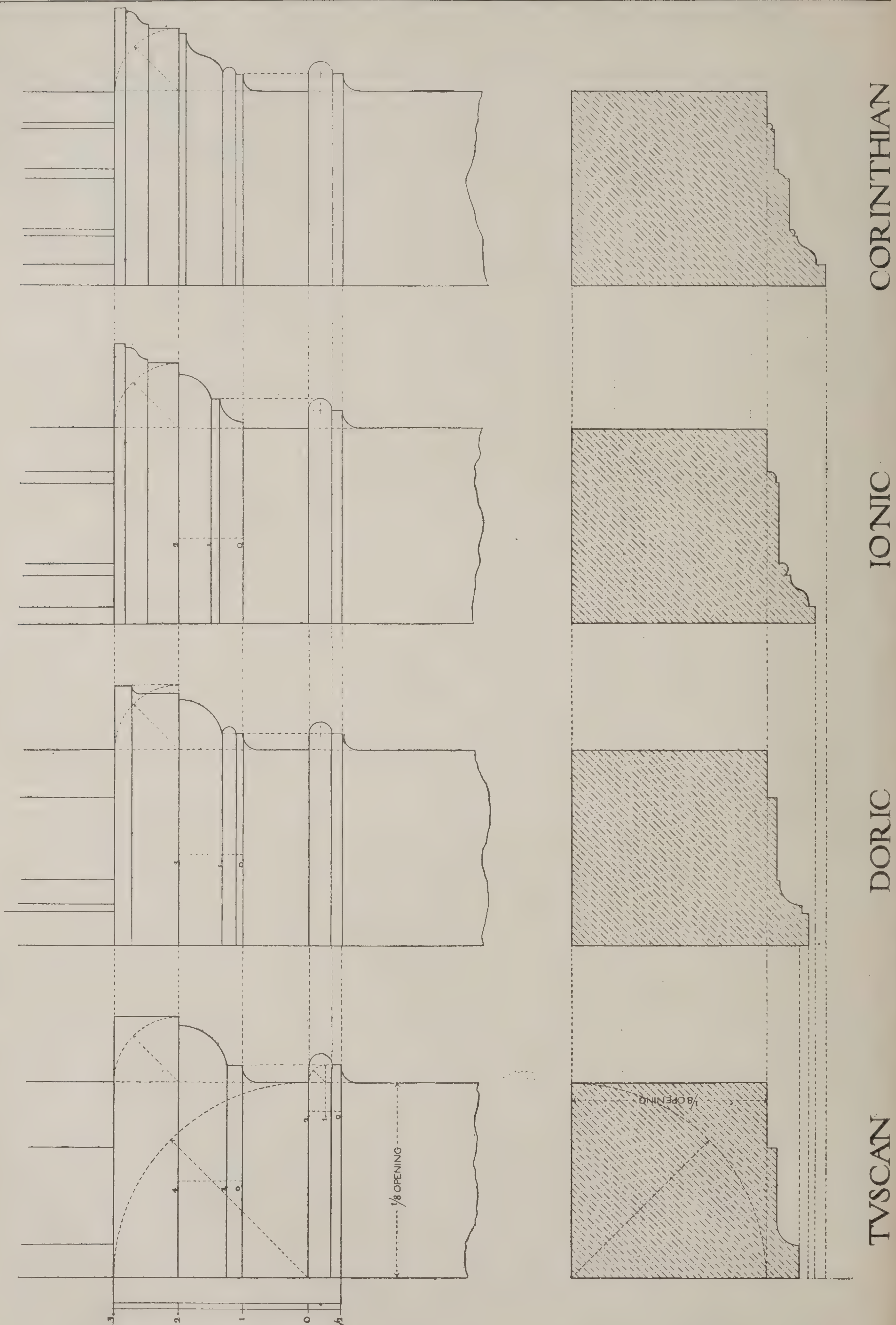


DORIC

THE ORDERS AND THEIR APPLICATION. BY ALFRED W. S. CROSS, M.A., F.R.I.B.A., AND ALAN E MUNBY M.A.

IMPOSTS AND ARCH MOVLDS

PLATE. 5



THE ORDERS AND THEIR APPLICATION. BY ALFRED W. S. CROSS, M.A., F.R.I.B.A., AND ALAN E. MUNBY, M.A.

Enquiries Answered.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

Reinforced Concrete Bridge.

DUNFERMLINE.—CLARION writes: "Can you advise as to the sufficiency of a bridge on a public road over a private roadway? It is 12ft. 6in. wide, and abutment walls will be of brick. Would reinforced concrete be suitable for heavy loads? Could you suggest the thickness at crown, and would expanded metal be preferable to rods? Could you give weights?"

Some useful notes upon designing a reinforced concrete bridge are given by D. B. Luten in "Engineering News" for June 28th last. (1.) *To determine the curve of intrados.*—Draw an ellipse of the required span and rise. Pass a segment of a circle through the crown and springings of the ellipse. Bisect the vertical ordinates between the ellipse and the circle as at A, Fig. 1. Approximate the resulting curve by arcs of circles, adjusting the curve at the springings, to become tangential to the verticals. Let C = crown thickness in inches, S = span in feet, R = rise from springings to crown in feet, F = fill over crown of extrados in feet, H = height of opening from pavement to crown in feet, U = uniform live loading in lbs. per sq. ft., L = moving load that will be concentrated on single track or single roadway, over entire span in tons of 2,000lbs., E = radius of extrados in feet, I = radius of intrados at crown in feet, P = diameter of abutment ties in inches, A = diameter of arch rods in inches, D = distance between rods in feet. (2.) *To determine the crown thickness.*—

$$C=\frac{3S^2(R+3F)}{4{,}000R-S^2}+\frac{US^2}{30{,}000R}+\frac{L(S+5R)}{150R}+4.$$

Applied to the present case

$$C=\frac{3S^2(R+3F)}{4{,}000R-S^2}+\frac{US^2}{30{,}000R}+\frac{L(S+5R)}{150R}+4$$

$$=\frac{3\times12{\cdot}5^2\times(2{\cdot}5+3\times1)}{4{,}000\times2{\cdot}5-12{\cdot}5^2}+\frac{280\times12{\cdot}5^2}{30{,}000\times2{\cdot}5}$$

$$+\frac{25(12{\cdot}5+5\times2{\cdot}5)}{150\times2{\cdot}5}+4=0{\cdot}262+0{\cdot}6$$

$+1{\cdot}666+4{\cdot}0=6{\cdot}528=$say 7 ins. (3.) *To determine the curve of extrados.*—The curve of the extrados is a segment of a circle of radius $E=I+\frac{C}{5}$. The extrados circle should be produced to its intersection with the abutment ties produced, but if such intersection does not occur within 75° of the crown of the extrados circle, then the back of the abutment is determined by a tangent to this circle, having a batter of 1 in 4. In the present case the abutments are to be of brick, which will slightly affect the ends. Radius $=E=I+\frac{C}{5}=12{\cdot}5+\frac{7}{5}=12{\cdot}5+1{\cdot}4=$ say 14ft. (4.) *To determine the diameter of abutment ties*, say 15ins. centre to centre.

$$P=\tfrac{1}{5}\sqrt{D(2C+H)}=\tfrac{1}{5}\sqrt{1{\cdot}25(2\times7+12{\cdot}5)}$$

$=\frac{5{\cdot}7}{5}=1{\cdot}14$ say $1\tfrac{1}{8}$-in. rods. (5.) *To determine the diameter of the arch rods*, 15-in. centres. $A=\sqrt{D\frac{SL}{250C}}=\sqrt{\frac{1{\cdot}25\times12{\cdot}5\times25}{250\times7}}$ $=\sqrt{0{\cdot}223}=$say $\tfrac{1}{2}$-in. rods. The complete design may now be prepared as in Fig. 2.

HENRY ADAMS.

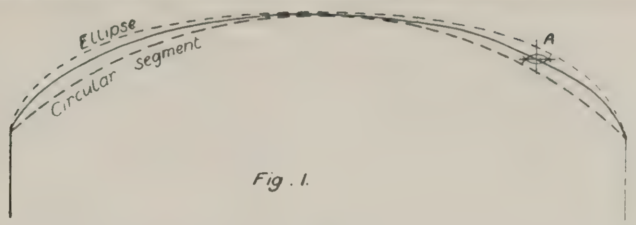


Fig. 1.

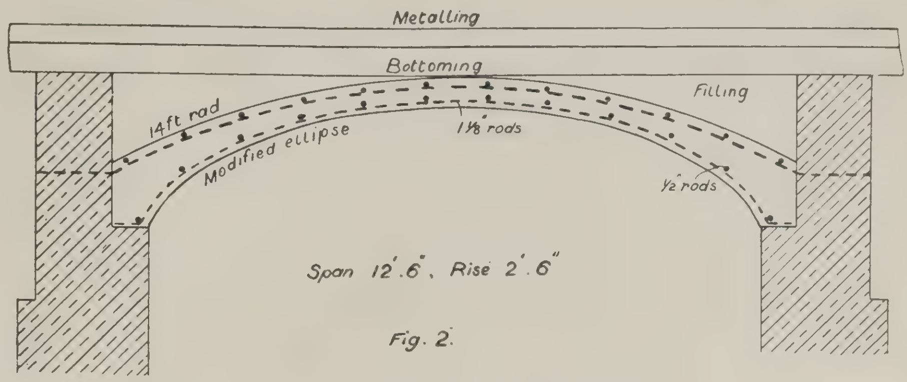


Fig. 2.

A SMALL REINFORCED CONCRETE BRIDGE.

New Windows and Ancient Lights.

A. B. writes: "(1) In taking down a building to the ground, with ancient lights in the gable end overlooking property adjoining, have I a right to re-erect the gable end and put in new windows of the same sizes in the newly-built gable? (2) Should I retain the right by propping up the windows in their old positions and taking the wall down and re-building around same? (3) Am I obliged to retain the exact positions of the old windows in the new gable, or can I re-arrange same, but keeping to the old sizes?"

(1) You lose no right by pulling down the wall and re-building, but you should re-build within a reasonable time. I advise you to have a careful drawing made by a competent man, showing the elevation of the old wall, with sizes and positions of the old lights, in case any dispute should hereafter arise with the owner of the "servient tenement." (2) There is no necessity for the awkward expedient you suggest. Put your old window frames into store, in case you need to hereafter produce them. (3) The Courts have several times decided that, though a man may alter his lights (*i.e.*, put in another kind of window) he may not enlarge the aperture. You should be careful to keep your new windows as nearly as possible the same as the old ones, and though it is probable that a slight alteration in their position will not cause you any legal difficulty, I suggest that in such a case you will do well to obtain your neighbour's approval of the altered positions. The law is "that lights in respect of which the right . . . is sought to be enforced must be substantially the same as the lights which have been gained by user or grant, and that no new light can be substituted without the consent of the owner of the servient tenement."

F. S. I.

Safe Load on Stone Column.

LONDON.—PUPIL writes: "There is a stone column in Ham Hill stone at the corner of an entrance porch to a house, with girders over, carrying walls, etc. The diameter of the column is 11½ins. at the middle, and the height from cap to base 9ft. 10ins. The total weight supported is 14 tons. Is the column safe? What is the safe load to put on Ham Hill stone per cubic foot 1ft. square? Sketch sent (not reproduced)."

The shaft of the column being swelled, and the maximum diameter 11½ins., the end diameter may be 10ins. or less. The actual minimum diameter should have been given, as this is the measure of the supporting area. Assuming it to be 10ins., the area will be 0.545 sq. ft. With Ham Hill stone cracking commences at 100 tons per sq. ft., and ultimate crushing takes place at 102 to 312 tons per sq. ft. on short specimens. A factor of safety of 10 is necessary in the practical use of stone for carrying loads, so that $\frac{100}{10}=10$ tons per sq. ft. extreme safe working load. Then $10\times0{\cdot}545=5{\cdot}45$, say 5½ tons, is all that ought to be put upon these columns; while one of them is stated to carry 14 tons, and therefore stands at a great risk.

HENRY ADAMS.

Buildings to Measure near Berwick-on-Tweed.

GLASGOW.—STUDENT writes: "Please name some buildings in or near Berwick-on-Tweed suitable to measure for the R.I.B.A. intermediate examination. Can you give any information about the town hall and the parish church of Berwick?"

There is very little good work in the neighbourhood of Berwick-on-Tweed. The parish church of Holy Trinity, built in a debased Gothic style, was completed by Puritans in the time of the Commonwealth, 1652, when the spire and tower were deemed unnecessary. It was restored and the chancel added in 1855. There may be a few features in it worth measuring. The building in the High Street which is the town hall, market place and gaol was built by Joseph Dodd, 1754-61. At Cocklan there is the ruined castelet of the Carrington family.

H. Y. M.

Chestnut Wood.

LONDON.—A. E. H. writes: "Having heard that chestnut wood used in the construction of a verandah or summer-house possesses the peculiarity of keeping off spiders, earwigs and other garden insects, I shall be glad if you can say positively that this is so."

I fear that this virtue cannot be maintained for the chestnut (no doubt the "Sweet Chestnut" is referred to), and my own experience has been that, as it cracks a good deal with the sun, it rather affords a harbour for insects. It is largely used for hop-poles in some districts, but is always displaced in favour of the more enduring larch where the latter is obtainable.

F. S. I.

Notes on Competitions

Mexborough Secondary School.

In this competition the design of Mr. J. E. Knight, of Rotherham, has been placed first; that of Mr. W. S. Braithwaite, of Leeds, second; and that of Messrs. Smith and Ensor, Sheffield, third. The designs have been on exhibition during the past week.

Emsworth Sewerage Scheme.

The competition for this scheme, to cost £17,000, has been decided in favour of Messrs. W. B. G. Bennett, Son and Berry, civil engineers, of Southampton and London; the scheme of Mr. H. Stringfellow, Emsworth, being placed second. There were 32 competitors. The assessor was Mr. G. R. Strachan, M.I.C.E.

Ellesmere Sewerage Scheme.

Nineteen schemes have been submitted in this competition.

The New County Hall.

Writing to the "Standard" in reference to this competition, Mr. Horace T. Bonner, A.R.I.B.A., says: —"On July 26th I addressed a memorial to the members of the London County Council asking that they should reconsider the question of inviting designs for the proposed building (which is to cost over one million pounds of the London ratepayers' money) from foreigners, and asking the committee to restrict the competition to British subjects. On October 10th I received a reply from Mr. Gomme, the clerk to the council, stating that he had laid my letter before the Establishment Committee of the London County Council, and he had to regret that the committee could not see their way to adopt my suggestion or alter the conditions. Now this building is not one that will be of an international character—it will be hardly even municipal, but almost, we might say, parochial. Then why should any foreigner have a finger in a pie to which, perhaps, he has not or ever will contribute one penny? If we are compelled to be parochial, let us be at least patriotic."

List of Competitions Open.

Deposit for conditions given where known.

DATE OF DELIVERY	COMPETITION.
Nov. 30	LIBRARY AT NEWTON-IN-MAKERFIELD.—Cost £4.000. Particulars from C. Cole, clerk to U.D.C., Town Hall, Earlestown, Lancs. No deposit.
Dec. 12	LAY-OUT OF RIDDRIE ESTATE, GLASGOW.—Premiums of £75, £50 and £25. Particulars from A. W. Myles, town clerk, City Chambers, Glasgow.
Dec. 31	DUAL SECONDARY SCHOOL AT GOOLE.—Premiums £50 and £25. Particulars from James W. Johnson, clerk to Governors, Council Offices, Goole. Deposit £2 2s.
Dec. 31	NURSES' HOME AT GENERAL HOSPITAL, WOLVERHAMPTON.—Particulars from J. Stephen Neil, House Governor and Secretary, General Hospital, Wolverhampton.
1907 Feb. 1	CHILDREN'S HOSPITAL AT SUNDERLAND.—Premiums of £100, £50 and £25. Particulars from T. Robinson, secretary, Infirmary Offices, Bank Buildings, Sunderland. Deposit £1 1s.
No. date.	BATHS AT ASHTON-IN-MAKERFIELD.—Limited to architects in Wigan and Leigh Poor Law Unions. Particulars from A. Sykes, clerk, Council Offices, Ashton in-Makerfield.

Notes and News

Mr. A. E. Pridmore has been re-elected president of the Society of Architects.

The Institute of Builders held its annual dinner on Wednesday last at the Hotel Metropole, Mr. Frederick L. Dove, president, in the chair.

Mr. Batsford and the "Times" Book Club.—Mr. B. T. Batsford, the well-known architectural publisher, writes to the "Daily Mail" in reference to the "Times" Book Club. Mr. Batsford, in the course of his letter, says: "It may interest some of your readers to know that one of my recent illustrated books, which I issued at £1 11s. 6d. nett, and of which I printed 2,000 copies, cost me, with author's royalty, over 18s. a copy. Many of my books, after allowing for royalties, cost nearly half the published price, and sometimes more. . . ."

New Works in Scotland.—With reference to the article under this head, on p. 186 in our issue for October 10th, dealing with the large scheme of new works at Kinlochleven for the British Aluminium Co., Ltd., we are asked to state that the reinforced concrete conduit leading from the reservoir to the head of the pipe line will be constructed with expanded steel supplied by the New Expanded Metal Co., Ltd., of Westminster. The conduit will be 8ft. square and 3½ miles long, built entirely of reinforced concrete, and roofed with slabs of the same material.

Architects and Rifle Shooting.—The Architectural Association Rifle Club will be inaugurated on Saturday, October 27th, at 3.30 p.m., by Major-General Lord Cheylesmore, C.V.O. (president of the National Rifle Association and Mayor of Westminster), at the headquarters of the London Scottish R.V., 59, Buckingham Gate, S.W., where rifle practice will be held on Thursday evenings from 5.30 to 9; revolver practice once a month. We wish the club every success in its patriotic aims. We should like to see other architectural associations following suit. The A.A. Rifle Club is limited to members of the A.A., or the Day School, the annual subscription being 7s. 6d., with 2s. 6d. subscription to the A.A. Athletic Club. Mr. J. H. Squire, 69, Palace Court, W., is the hon. secretary.

SELBY ABBEY FIRE.

The fire which occurred last Saturday at Selby Abbey has, of course, resulted in irreparable injury; but the structure has not, as one might assume from newspaper headlines, been "ruined." The "Norman" nave and the "Early English" choir remain, though blackened and spalled in parts. The nave roof has been destroyed, and the pews in the nave. The modern organ, about which so much regret seems to be uttered, is a very small loss monetarily. The timber vaulting to the choir has also been burned, and in falling has demolished the reredos. The stained-glass window on the north side of the choir was also burned out; but, remarkable to relate, the east window has remained intact. The greatest loss is the destruction of the richly-carved choir stalls. It will not, however, be so difficult to restore the church, for it must not be forgotten that the building was restored in 1872-3 by Sir Gilbert Scott, and later again at a cost of £10,000. The damage done is estimated at £50,000.

R.I.B.A. PROGRAMME.

The following is the programme of meetings of the Royal Institute of British Architects for the forthcoming session, so far as at present arranged:

1906.	
Nov. 5.	Opening Meeting. Presidential Address. T. E. Collcutt.
Nov. 19.	The Crœsus (6th century B.C.) Temple of Artemis at Ephesus. A. E. Henderson.
Dec. 17.	Strength and Composition of Mortar. W. J. Dibdin.
1907.	
Jan. 21.	Marbles, their Ancient and Modern Application. Sir Lawrence Alma-Tadema and William Brindley.
Feb. 18.	Modern Church Building. Sir Charles Nicholson and Hubert C. Corlette.
Mar. 18.	Libraries. Henry T. Hare and J. Duff Brown.
April 8.	Hotels. Stanley Hamp.

R.I.B.A. Examinations: An Alteration.

The following changes in the days of sitting for the R.I.B.A. examinations have been sanctioned:—The Preliminary and Intermediate examinations will begin on Monday instead of Tuesday as formerly, and there will be an interval of one day between the written and the *vivâ voce* portions of the Intermediate. The Final and Special examinations will begin on Thursday instead of Friday as formerly, and there will be a similar interval between the written and the *vivâ voce* work. These changes, which have been made in order to give the examiners more time to go through the candidates' written work, will come into operation at the examinations next month.

Our Plates

A Block of Town Houses.

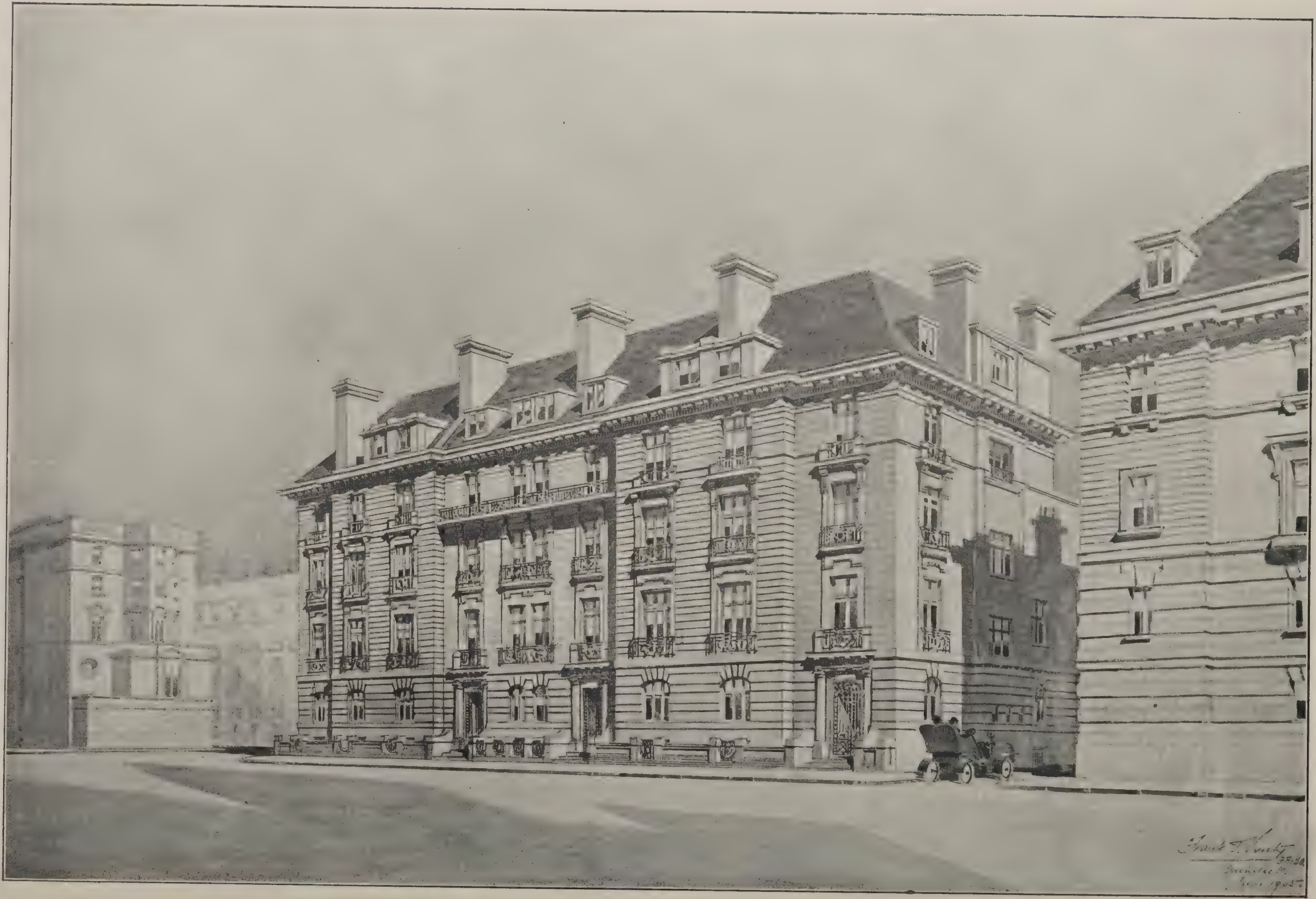
The mansions and flats shown in the perspective view have been erected on a site facing St. James's Palace in Cleveland Row, S.W. The block has been designed for three town houses with motor accommodation, provided at the back. The windows are grouped symmetrically and enriched by the use of iron balconettes of an architectural character, the whole building being crowned by a modillion and dentilled cornice. The materials employed are Portland stone for the walling, with Westmorland slates on the roofs. The general contractor was Mr. J. Carmichael, of Wandsworth, and the architect Mr. Frank T. Verity, F.R.I.B.A., of 7, Sackville Street, London.

Design for Whitefield Tabernacle Extension.

The design for an extension of Whitefield Tabernacle, Tottenham Court Road, was submitted in competition some time ago. The building was intended to be carried out in stocks and red bricks, with a base 6ft. or 7ft. high of salt-glazed bricks. The chequered band above is faced with green and white glazed bricks. The apparent battlements on the ground floor are merely the thinning of the front wall, done externally in place of at floor level inside, and have become much exaggerated in photographing from the coloured original. The roof, except for the three gables, consists of two large asphalt flats, to be used as airing-grounds, one for the factory girls' club (over lecture-rooms) and the other for the Institute, most of the rooms of which are shown on the basement plan. The billiard and reading rooms shown on the principal floor are part of another club—one for workmen. The architect was Mr. F. W. Troup, F.R.I.B.A., of 14, Gray's Inn Square, W.C.

LIBRARY
OF THE
UNIVERSITY OF ILLINOIS

Supplement to
THE BUILDERS' JOURNAL AND ARCHITECTURAL ENGINEER,
Wednesday, October 24th, 1906.



MANSIONS AND FLATS, CLEVELAND ROW, CLEVELAND SQUARE, ST. JAMES'S, LONDON, S.W. FRANK T. VERITY, F.R.I.B.A., ARCHITECT.

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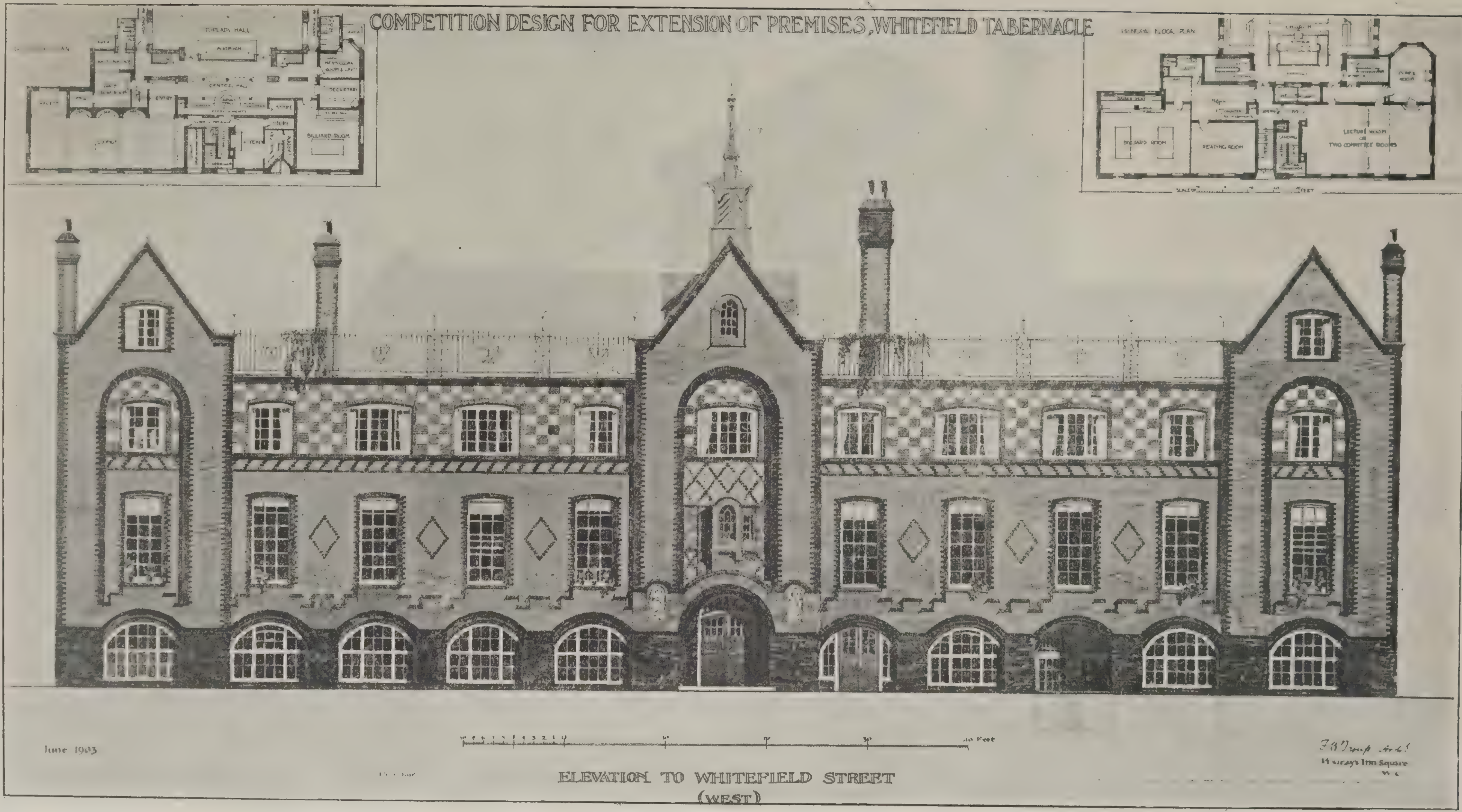
THE BUILDERS' JOURNAL AND ARCHITECTURAL ENGINEER,
Wednesday, October 24th, 1906.


COMPETITION DESIGN FOR EXTENSION OF PREMISES, WHITEFIELD TABERNACLE

ELEVATION TO WHITEFIELD STREET
(WEST)

LIBRARY
OF THE
UNIVERSITY OF ILLINOIS.

THE ARCHITECTURAL ASSOCIATION.

The Architecture of the Roman Empire.

A meeting of the Architectural Association was held on Friday evening last at 18, Tufton Street, Westminster, Mr. R. S. Balfour, F.R.I.B.A., president, in the chair. The minutes of the preceding meeting having been read and confirmed, 59 new members of the Association were elected, and the report and balance sheet for the past year was approved. Mr. Alan Potter then read a paper on "The Architecture of the Roman Empire." The particular interest of this paper was in the excellent series of lantern slides illustrating it. These showed all the most notable buildings and engineering works of the Romans, and in connection with them Mr. Potter gave a running commentary, dealing with his subject chronologically. Without the illustrations we do not think it sufficiently to our purpose to give Mr. Potter's remarks in full, but the following is a summary of what he said:—

Of the Augustan era, which embraced the commencement of Imperial Rome, the chief remains are in the neighbourhood of the capitol. These are the Forum Julium, with the Temple of Mars Ultor to the north; the Basilica Julia, used as a law court, open in the centre, and surrounded by a double colonnade of piers in two storeys; the Temple of Castor, rebuilt on a podium of concrete and marble 22 ft. high; the circular Temple of Mater Matuta, with which it is interesting to compare the circular Temple of Vesta at Tivoli—the former, on low-lying ground, having a peristyle of 20 Corinthian columns of the very light proportion of 11½ diameters, while the latter, perched on the edge of a precipice, has columns of only 9½ diameters; the Temple of Minerva at Assisi; the arch erected at Rimini by Augustus in B.C. 27; the triumphal arch at Susa in Piedmont; and the palace on the Palatine.

Having briefly considered these works of Augustus, Mr. Potter went on to deal with

The Hydraulic Enterprises of Claudius.

The Acqua Claudia was built during his reign (38-52 A.D.) to bring water from the Alban Hills, 40 miles away, and was raised high enough to supply the highest hills in Rome. The Anio Novus, a channel built on the top of this aqueduct, was 50 miles long. Claudius also built, in opposition to the Council of Government engineers, a large harbour two miles west of Ostia, enclosed by two jetties each 800 yds. long, with a varying depth of 15 ft. to 18 ft., necessitating the removal of 112,000,000 cubic ft. of sand. Nero proposed connecting this harbour to Rome by a canal, but the scheme was never carried out. His ambition was to lay out Rome on modern lines, but he found himself checked on every hand by the owners of private property, and the numerous small temples and shrines absolutely inviolable in the eyes of the people.

Nero's Rebuilding of Rome.

After arranging a new plan with his architects, Severus and Celer, and having provided temporary accommodation for the people, he set fire to the city, as the easiest way of getting out of his difficulties, and succeeded so well, that he reduced 10 wards of the city to ruins out of 14, without a single life being lost.

Hasty rebuilding was forbidden, as all frontage lines had to be approved, the new streets being planned at right angles to each other, as far as the lay of the land would allow. The height of houses was restricted to double the width of the street, and each had to have a portico across the front.

Nero's Golden House.

Of this land of ruins, he appropriated, for his own palace, an area of about a square mile, where he built the Golden House, in the grounds of which there were sulphur and sea-water baths, a huge lake with harbours and docks for the imperial galleys, besides colonnades, 3,000 ft. long, zoological and botanical gardens, not to mention streams, woods, vineyards, and farms.

Otho, on the day of his election, signed an order for £250,000 to complete these buildings; but after his murder, Vespasian, the first Flavian Emperor, of low birth and more parsimonious character, at once began to give back this land to the people. He and Titus founded the Colosseum on the very spot of Nero's lake, and the latter afterwards built his baths on the foundations of the Golden House itself.

(In connection with the Colosseum Mr. Potter mentioned that the authorities seem now to have entirely abandoned the idea of an awning being carried by the masts, which rested on the external row of corbels in the topmost storey, believing them merely to have been used for banners.)

The Baths of Titus.

These were of the usual plan: a main block of buildings containing the baths proper, enclosed within an outer court, part of which was set aside for games, and part for promenades and gardens. In the centre of this block was the tepidarium, and, on the same axis, were the calidarium on the one side, and the swimming bath on the other, the other sides being occupied by open courtyards surrounded by colonnades.

The arch of Titus, erected on the Via Sacra, to commemorate the final subjection of the Jews in A.D. 82, is particularly interesting on account of the representation of the ornaments of the Temple at Jerusalem, as carried in the triumph of Titus.

It was Titus and his brother Domitian who filled in the gorge between the Palaces of Caliqula and Tiberius and the House of Augustus, and built over it the Flavian Palace, which is the finest group of all the Palatine buildings, chiefly composed of banqueting halls and reception rooms, with the Imperial Basilica at the north-east corner.

Domitian also rebuilt the Augustan Palace and added the stadium on the west side of it; the walls of the latter still remain, and some small fragments of the encasing marble.

The Forum of Trajan.

On the further side of the Augustan Forum was built the Forum of Trajan, from the designs of the architect Apollodorus, together with the Ulpian Basilica and Trajan's Column and Temple. The forum proper was nearly square in plan with a colonnade running round three sides, flanked by two large hemicycles of shops and offices, and approached from the east by a gateway having one central archway with three Corinthian columns on each side.

The Harbour of Ancona.

In order to facilitate the embarkation of troops to the East, Trajan built the harbour of Ancona on the east coast of Italy, to commemorate or adorn which the Ancona Arch was built. He also continued the work of Claudius at Ostia, building inside the Claudian Harbour a huge hexagonal dock, 18 ft. deep, some 390,000 sq. yds. in extent, with nearly 6,500 ft. of quay. It was to this harbour that the fleet of despatch boats plied, and here was situated the central post office for provincial letters. The harbour at Civita Vecchia was also built at this time, and still remains among the best and safest harbours of the Mediterranean.

Trajan's reign was also responsible for the bridge across the Tagus at Alcantara, in Spain, consisting of six arches 650 ft. long in all, the two central arches having a span of 110 ft. and a height of 210 ft., the material being granite laid without mortar: and of the same date, probably, are the Segovia Aqueduct with its 320 arches, and the Tarragona Aqueduct 1,000 ft. long with 39 arches. The arch at St. Remi, in France, also seems to be of this date, while in Africa the triple arch at Timgad, dedicated to Trajan the son of Nerva, is especially interesting.

At Beneventum, in Italy, the Senate in 114 built an arch in expectation of the Emperor's triumphal return from the East, where he was adding many new provinces to the Empire; but in 116 he died out there without returning home.

The Buildings of Hadrian.

The first act of Hadrian his successor was the restitution of these provinces; and his whole reign seems to have been a perpetual journey, as he visited, in person, every province of the Empire, from Scotland to Egypt. He was keenly interested in the arts, and is responsible for the design of the Temple of Venus and Rome built between the Forum and the Colosseum.

The great vaulted rotunda known as the Pantheon was also built by Hadrian, though previously considered to belong to Republican times. The interior is lighted by a single circular opening at the apex of the dome, which gives a window area of not quite 4 per cent. of the floor space. The portico on the south side was constructed of materials taken from the Temple of Agrippa previously standing to the north of the rotunda.

At Nimes, in the south of France, there is a perfect temple of this date.

At Athens the Odeion was erected by Herodes Atticus, who also erected a theatre at Corinth, a stadium at Delphi baths at Thermopylæ, and an aqueduct at Canusium in Italy.

The best-known building of the reign of Antoninus Pius, who suceeded Hadrian, is the Temple of Faustina.

The Colonnaded Streets of Syria.

The Syrian towns at this time were tremendously wealthy, and vied with each other in the display of architecture. At Palmyra, 140 miles north-east of Damascus, there are the most numerous remains, but all the large towns, such as Antioch, Gerasa and Damascus, were laid out in a similar manner.

The most remarkable features perhaps were the colonnaded streets carefully set out with architectural intent. One at Palmyra, ovr 3,000ft. long, consists of a central roadway 37 ft. wide open to the sky and flanked by Corinthian columns 31 ft. high, with sidewalks 16 ft. wide, which were covered with terrace roofs extending over the adjoining shops and offices.

The Temple of the Sun at Palmyra was enclosed in a huge courtyard more than 700 ft. square, surrounded by a double Corinthian colonnade. At Damascus the courtyard was over 1,000 ft. square, while at Baalbec the Temple of the Sun had a colonnaded forecourt about 500 ft. square.

In Africa, of this date, there is the triple temple at Steilla, also standing within a colonnaded enclosure 200ft. square, entered from the south-east by a triple arched gateway.

Belonging to the next reign is the Temple of the Capital at Dougga in Africa, as also the Arch at Orange.

The Works of Septimus Severus.

Septimius Severus, leader of one of the three provincial armies, having seized Rome after internal tumult, restored Domitian's Stadium on the Palatine, and built further west a new palace, the facade of which faced the Appian Way and consisted of seven colonnaded storeys 210 ft. high. The arch erected at the west end of the forum to commemorate his Parthian victories is well known. Septimius Severus died in 211 at York after an unsuccessful campaign against the Scotch, and it was there the quarrelsome brothers Geta and Caracalla assumed the purple; a quarrel which was settled within the twelvemonth by the murder of Geta.

The Baths of Caracalla

testify to the luxury of this emperor, being the most extensive in the Empire; the central block alone had an area of 270,000 sq. ft., and in plan was similar to the baths of Titus, except that the swimming bath was greatly reduced. The enclosure of the grounds was over 1,000 ft. square, in the two hemicycles of which were lecture theatres and libraries.

In Africa, at Djemila, there is an arch dedicated to Caracalla, his mother Domna, and the divine Severus, his father, and at Sebessa there is a four-sided arch with the same dedication.

At Zana there is an arch dedicated to Macrimus, successor to Caracalla, who reigned little more than a year. During the next fifty years, there were no fewer than fourteen Emperors. It was during this half century that the amphitheatre at Verona was probably built.

In 270 Aurelian came to the throne. He erected on the Quirinal at Rome a large Corinthian temple, dedicated to the Sun, which had a portico of 12 columns and was enclosed in a courtyard similar to the Syrian examples. The little circular temple at Baalbec is suppsed to be of this date, and possibly also the Temple of Jupiter.

His successor Probus is credited with building temples, bridges, porticoes, and palaces in Egypt, as he attempted to keep the army in order by thus occupying them in times of peace.

Diocletian.

After the short reign of Carus, and Carinus and Numerian, Diocletian was proclaimed emperor in 284. He, with his associates, Maximian, Galerius and Constantius, re-established order and tranquillity throughout the Empire.

Of the baths he built in Rome there are considerable remains, the tepidarium or central hall being preserved as the nave of Santa Maria degli Angeli.

The emperor himself spent only two months of his reign actually in Rome, occupying most of his spare time building the city of Nicomedia, in Bithynia, on the verge of Europe and Asia, and to such an extent did he enrich it that it was only surpassed by the magnificence of Antioch, Alexandria and Rome.

In 306 he abdicated and retired to the coast of Dalmatia, near the city of Salona, where he had built himself a palace, the finest feature of which was the colonnade on the south side, facing the sea.

Emperor Constantine.

After the retirement of Diocletian the Empire fell again into great disorder, at one time there being no fewer than six emperors; but eventually, after the defeat of Maxentius, Constantine became sole ruler.

The Basilica built to the west of the Forum at Rome by these two emperors was practically a copy of the tepidarium of Caracalla's baths.

The Arch of Constantine is too well known to need remark, except perhaps to say that most of the sculpture belongs to an earlier date, ruthlessly taken from the buildings of Hadrian and Marcus Aurelius.

The Building of Constantinople.

For Constantine, born on the banks of the Danube, and raised to the throne by the army of Britain, Rome had little attraction, and it was his great ambition to perpetuate his memory by building a new capitol further east. When he came to the actual building of Constantinople he soon found that the skill and number of his architects were not equal to the carrying out of his ideas; so much so that he founded schools of architecture in all the provinces of the Empire, and by offering prizes and rewards encouraged capable men to make themselves known.

The immediate result at Byzantium was a number of elaborate buildings, hurriedly erected on narrow streets, to adorn which he ordered that the ancient buildings of the Empire should be robbed of their carvings and statues.

Within a hundred years of the foundation of Constantinople there were erected in the city a huge elliptical forum, a hippodrome more than 300 yds. long, a circus, 2 theatres, 8 public and 150 private baths, 52 porticoes, 5 granaries and 8 aqueducts, besides 14 churches, 14 palaces and 4,388 houses.

Mr. Hugh Stannus, in proposing a vote of thanks to the lecturer, said that such a succinct account of Roman architecture had not, he thought, been given before, and they were all indebted to Mr. Potter for a most instructive and interesting paper. Mr. Arthur Keen seconded the vote of thanks, and after a few remarks from Mr. Balfour the meeting terminated.

It was announced that the next meeting of the Association would be held on November 2nd, when Mr. Stannus would read a paper on "The Corinthian Order."

Obituary

The late Mr. Joseph Gornall, of the firm of J. Gornall and Son, builders and contractors, Bolton, who died on September 23rd, left estate which has been proved at £21,246 gross.

Mr. Henry McKay, architect, of Hove, aged 43, was found drowned in the canal at Aldrington last week. At the inquest a verdict of "found drowned" was returned.

Mr. H. W. Stock, F.R.I.B.A., B.A., district surveyor for St. Anne, Limehouse; St. John, Wapping; the Precinct of St. Katharine, and the Hamlet of Ratcliffe, was found drowned in the Thames near Pangbourne on Thursday evening last, after having threatened suicide.

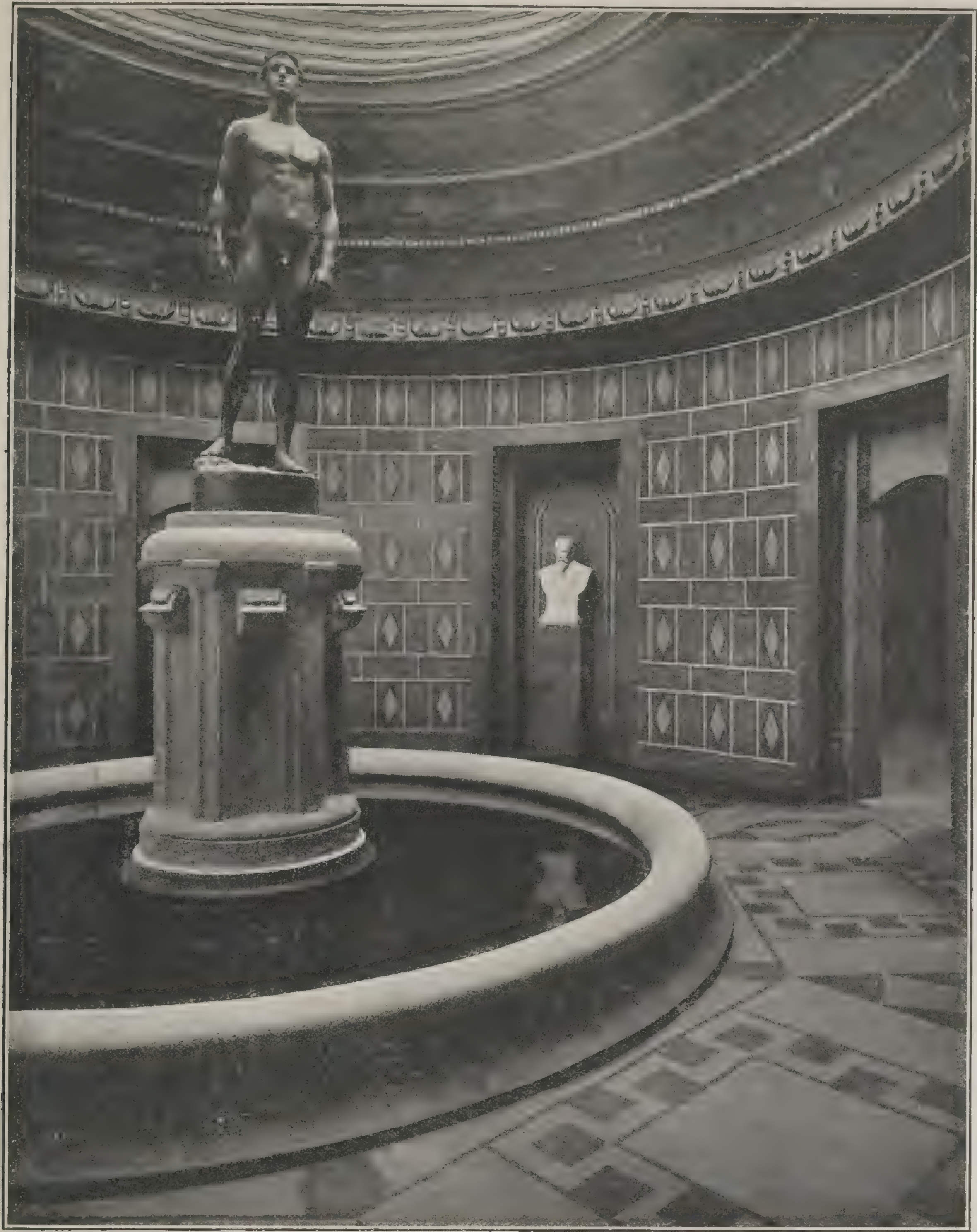
FRENCH SCULPTURE.

A lecture on this subject was given last week by Mr. Henry F. David before the first meeting of the session of the Aberdeen Architectural Association. The lecture dealt with the outstanding developments of sculpture from the time of its severance from Gothic influence in the 15th century down to the work of Rodin. In Jean Goujon, "the first modern French sculptor," the characteristics of culture, refinement and tradition were seen in a high degree. The periods of Louis XIV. and XV. showed the art entangled with the whims and caprice of a vain and pleasure-loving time; and in this it remained true to its character as an expression of paramount tastes and tendencies.

The pronounced feeling for classical tradition and culture in French art generally found an outlet in the works of Pradier and Etex and others of the Greek school in the early 19th century. Its unfailing return to nature, as the corrective of a lapse into convention and formula, appeared in the works of Houdon, the great portraitist of the early 19th century. His seated statue of Voltaire was an instance of this. This was followed by the highly individual work of Rude, Carpeaux and Barye, carrying the work into contemporary times.

Rude's famous group on the Arc de Triomphe in Paris was referred to as an example of a fine plastic motive, expressed with a keen individual feeling and classic restraint and dignity. "The Dance," by Carpeaux, on the façade of the Opera House exhibited the high-water mark of the expression of life and movement to an extent almost antagonistic to architectural dignity and restraint. The underlying motive of Barye's art was noted, and his famous bronze lion at the Louvre was selected as representative of his work in fixing the moods and actions of the splendid creatures of the animal world.

The work of the French Academy of the present day was criticised, its high level of technical accomplishment commented on, and the general elegance and culture of its sculpture; its radical fault was a too close adherence to tradition. Examples of Guillaume, Dubois, S. Marceaux and others were criticised from this point of view. The reaction against the Academy, which in recent years has sprung up in the works of Rodin and his followers, was discussed as the latest phase in French sculpture. The highly individual character of Rodin's art was dealt with by reference to some of his most important works, such as "The Burghers of Calais," "The Age of Brass," "John the Baptist," and the recent statue of Balzac, which aroused so much curiosity and resentment in the public mind.



MONUMENTAL FOUNTAIN IN ROTUNDA, DRESDEN ART EXHIBITION, 1906. WILHELM KREIS, ARCHITECT. AUGUST HUDLER, SCULPTOR.

A NEW MATERIAL.

The above illustration shows the rotunda in the pavilion called the "Saxon House" at the recent Dresden Art Exhibition. An interesting feature of the construction is that both the walls and the floor of this rotunda are carried out in a new jointless material known as "Doloment," somewhat similar to the many well-known floor materials composed of magnesian or other special cements with an aggregate of sawdust, asbestos, &c. The above example shows that the material has considerable decorative possibilities. "Doloment," we are assured, has the largest sale on the Continent among materials of its kind, although it was only invented two years ago. It received the highest awards at this particular art exhibition at Dresden last July, and also at the Hygienic Exhibition at Vienna this month. The architect to the Municipality of Berlin states that of all the different floor materials he has tried "Doloment" takes first place, and other leading architects and engineers have expressed similar high opinions. Factories for the manufacture of the material have been established at Paris, Vienna, Budapest, Amsterdam, Berlin, Charlottenburg, Düsseldorf, Frankfurt-on-the-Main, Strassburg, Basle, Wondelgem and Devant-les-Ponts, and it is just about to be placed on the English market. "Doloment" is a plastic substance having the consistency of mortar, made of pulverised wood fibre, asbestos and a mineral substance, and coloured by the mixture of various oxides to any desirable tint. It is laid in a smooth layer ½in. thick on a concrete foundation, with an intervening layer of a composition composed of cork chips, asbestos, sawdust and some cohesive matrix. This intermediate layer, being elastic, separates the surface layer from the rigid concrete foundation and makes it warmer and less resonant, absorbs moisture, and neutralises the effect of any cracks that may occur in the concrete. "Doloment" therefore, neither cracks nor bulges. It is impervious to liquids, and of course does not harbour dust, microbes, &c., having a surface like that of polished marble. The office of the British "Doloment" Works is at Royal London House, Finsbury Square, E.C.

Complete List of Contracts Open.

WITH a few exceptions, news of Contracts Open are not repeated after they have been published once in these columns, so that readers will find particulars in our previous issues of other contracts that still remain open.

Unless expressly stated to the contrary, all deposits required for bills of quantities, &c., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair-wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING,

Oct. 26. Merthyr Tydfil.—*Extensive alterations and additions* to the Vulcan Hotel, Merthyr Tydfil. Plans and specifications may be seen of A. L. Thomas, A.M.I.M.E., engineer and architect, Church Street Chambers, Pontypridd. Sealed and endorsed tenders to be sent to him on or before Oct. 26.

Oct. 26. Colchester.—*Additions to the administration block* at the Infectious Diseases Hospital, Mile End. Plans may be seen and copies of specifications, quantities, &c., obtained on application to H. Goodyear. A.M.I.C.E., borough engineer and surveyor, Borough Engineer's Office, Town Hall. Sealed tenders, endorsed "Additions, Infectious Diseases Hospital," to be delivered to him not later than 10 a.m., Oct. 26.

Oct. 27. Gladhouse.—*Erection of cottage* at Gladhouse for the Edinburgh and District Water Trust. Schedules of quantities may be had on applica-to E. C. Carse, architect, 37, Frederick Street, Edinburgh, at whose office plans of the proposed cottage may be seen. Tenders, endorsed "Cottage at Gladhouse," must be lodged with W. Boyd, W.S., clerk to the Trust, Edinburgh and District Water Trust Offices, 12, St. Giles Street, not later than Oct. 27 at 10 a.m.

Oct. 27. Great Burstead.—*Structural alterations and additions* to the Council School, Great Burstead. Plans, specifications, and form of contract may be inspected at the office of F. Whitmore, architect, 73, Duke Street, Chelmsford, between the hours of 10 and 5 o'clock on any working day except Saturday. Builders desirous of tendering must send in their names and addresses to the architect at once, when a copy of bill of quantities will be supplied to each applicant, if references are satisfactory. Any tender accepted must be subject to the approval of the Local Government Board. Sealed tenders, endorsed "Tender for Great Burstead School Alterations," should be sent to F. W. Bittles, clerk, Brentwood, not later than Oct. 27.

Oct. 29. Outlane.—*Erection of a boundary wall* at the Children's Homes, Outlane. Plan and specifications may be seen on application, and sealed tenders must be sent in to reach E. A. Rigby, clerk to the Guardians, Union Offices, Ramsden Street, Huddersfield not later than noon on Oct. 29.

Oct. 29. Farnworth.—*Erection of a new public elementary school* in Plodder Lane, Farnworth. Bills of quantities may be obtained on written application to H. Rostron, secretary of education, Education Office, Darley Street, Farnworth, near Bolton, by payment of a deposit of £1 1s. Fair wages clause. Tenders must be delivered before 12 o'clock noon on Oct. 29, sealed and endorsed, to the Secretary.

Oct. 29. Leeds.—*Erection of proposed alterations and additions to works* and offices for Frank Horsell & Co., Ltd., Holbeck, Leeds. Contractors desirous of tendering are requested to forward their names to J. B. Fraser, architect, Leeds. Drawings and specification can be seen and bills of quantities obtained on payment of a deposit of £1. Endorsed tenders to be delivered to the architect before 10 a.m. on Oct. 29.

Oct. 29. Nottingham.—*Alterations and additions* at the All Saints' Schools, Forest Road West, for the Nottingham Education Committee. Plans may be seen at, and copies of the specifications obtained from, the office of F. B. Lewis, city architect, Guildhall, on payment of a deposit of £1 1s. Sealed tenders, addressed to W. J. Abel, clerk; offices, Victoria Street, properly endorsed, to be delivered not later than 10 a.m. on Oct. 29. Fair wages clause.

Oct. 29. Manchester. — *Taking down and removal of certain buildings* at the Rochdale Road Gas Works. Specification and form of tender may be obtained on application to C. Nickson, superintendent, Gas Department, Town Hall, Manchester. Any further particulars may be had on application to J. G. Newbigging, M.Inst.C.E., at his office, Rochdale Road Gas Works. Sealed tenders, addressed to the Chairman of the Gas Committee," and endorsed "Pulling down old buildings, &c, Rochdale Road Station," must be delivered at the Gas Offices, Town Mall, Manchester, not later than 10 a.m. on Oct. 29.

Oct. 30. Llanrug.—*Erection of a new chapel* adjoining Pontrhythallt Station for the Llanrug C.M. Chapel Committee. Plans and specification to be seen at the secretary's house, Eryri Terrace, Llanrug, to whom sealed and endorsed tenders are to be sent on or before Oct. 30.

Oct. 30. Exeter.—*Erection of new offices* at Exeter (St. David's) station for the Directors of the Great Western Railway. Plans and specification may be seen, and forms of tender and bills of quantities obtained, at the office of the Engineer at Plymouth (North Road) station, between the hours of 10 a.m. and 4 p.m. Tenders, addressed to G. K. Mills, secretary, Paddington Station, London, and marked outside "Tender for Offices at Exeter," will be received on or before Oct. 30.

Oct. 30. Rhondda.—*Alterations and additions to the Isolation Hospital*, Ystrad, Rhondda, including the erection of a pavilion, combined convalescent and discharging block, and additions to the present administrative block, laundry, and stable blocks for the U.D.C. Plans and specification may be seen and bills of quantities and tender forms obtained at the office of W. D. Morgan, architect, Post Office Chambers, Pentre, upon the production of a receipt for a deposit of £2 2s. from the accountant of the Council, which can be obtained at the Council Offices, Pentre. Fair wages clause. Sealed tenders, endorsed "Tender for Hospital Extensions." must be delivered before noon on Oct. 30, at the Council Offices, Pentre, Rhondda, addressed to "The Chairman of the Health Committee, Rhondda U.D.C."

Oct. 30. St. Blazey.—*Erection and completion of shops, stores, and other offices* at Station Road, St. Blazey, for the St. Blazey and District Co-operative Society Ltd. Plans, specifications, and general conditions can be seen, and full particulars obtained at the office of F. C. Jury, architect, No. 1, Alma Villas, Tregonissey Road, St. Austell. Tenders, sealed and endorsed "Shops and Stores Tender," must be sent to W. Foster, secretary, St. Blazey and District Co-operative Society, St. Blazey, Par Station, on or before Oct. 30.

Oct. 30. Timoleague, Co. Cork.—*Erection and completion of a new Parish Church* at Timoleague, County Cork, according to the plans and specifications prepared by M. A. Hennessy, architect, 74, South Mall, Cork. Copies of the plans and specifications and general conditions of contract may be seen daily at the Parochial House, Timoleague, or at the offices of the architect, South Mall, Cork. Copies of the quantities can be had on application to the architect on payment of £3 3s. Sealed tenders to be addressed to Rev. Peter Hill, P.P., Timoleague, on or before Oct. 30.

Oct. 31. Rye.—*Erection of new Grammar School*, Rye. Persons desirous of tendering are requested to send their names and addresses to E. J. Cory, High Street, Rye, Sussex, from whom full particulars can be obtained. Tenders must be delivered not later than Oct. 31, to W. Dawes, clerk to Governors, Bank Chambers, Rye.

Oct. 31. Aldershot.—*Erection of the first portion of Catholic Soldiers' Institute*, South Camp, Aldershot. Plans and specification may be seen and bills of quantities obtained from W. Bevan, F.R.I.B.A., architect, 90, Parliament Chambers, Great Smith Street, Westminster, London, S.W., on payment of £1. Tenders to be delivered by noon Oct. 31.

Oct. 31. London, W.—*Alterations and additions at No. 96, King Street*, Hammersmith. Plans of the intended works may be seen and a copy of the specification, with form of tender, can be obtained on application to H. Mair, M.I.C.E., borough surveyor. Sealed tenders, endorsed "Tenders re No. 96, King Street," to be delivered to H. Thompson, town clerk, Town Hall, Broadway, Hammersmith, W., not later than 6 p m. on Oct. 31.

Oct. 31. Plumstead. — *Erection of a new women's dining hall* at the Union House, High Street, Plumstead, for the Guardians of the Woolwich Union. The plans and specifications can be inspected at the office of J. O. Cook, Board's Architect, 1A, Eleanor Road, Woolwich, where copies of the quantities can be obtained on the payment of £1 1s. deposit, and tenders must be sent to T. Cutter, clerk to the Guardians, not later than 4 p.m. on Oct. 31, at 30, Rectory Place, Woolwich.

Oct. 31. Armley.—*Erection of new block* at the Workhouse, No. 3 Green Hill Road, Armley, for the Board of Guardians. Drawings and specifications may be inspected, and form of tender and bills of quantities obtained, at the offices of C. F. Wilkinson, architect, 35, Park Square, Leeds, on deposit of £1 1s. Tenders must be endorsed "Erection of new block at the Workhouse," and addressed to A. Gaunt, clerk, Union Offices, 1, Green Hill Road, Armley, and must be delivered before 12 o'clock noon on Oct. 31.

Oct. 31. Birkenhead.—*Erection and completion of 18 tenement dwellings* on the east side of Egerton Street. Plan, specification, and particulars can be seen and bill of quantities and form of tender obtained on application at the office of C. Brownridge, M.I.C.E., borough engineer and surveyor, upon a deposit of the sum of £3 3s. Fair wages clause. Tenders upon the printed form supplied, sealed and endorsed "Tender for Dwellings, Egerton Street," to be sent to A. Gill, town clerk, Town Hall, Birkenhead, not later than 12 o'clock noon on Oct. 31.

Nov. 1. High Spen.—*Erection of 39 cottages at High Spen*, for the Consett Iron Co., Ltd. Plans and specifications may be seen and quantities obtained upon application to C. E. Oliver, company's architect, at the General Offices of the Company at Consett. Tenders addressed to the Consett Iron Co., Ltd., and endorsed "Tender for Cottages" must be delivered on Nov. 1.

Nov. 1. Blawith.—*Alterations and additions to the residence* known as Brown Howe, also to lodge and farm buildings, situate at Blawith, near Greenodd, for Sir Robert A. Hampson. Plans and specifications may be seen on application to the gardener at Brown Howe. Sealed and endorsed tenders to be sent to W. L. Mason, F.R.I.B.A., architect, Ambleside, not later than noon on Nov. 1.

Nov. 2. Wharfedale.—*Erection of new board-room offices*, &c., for the Wharfedale Union. Quantities can be obtained and the plans seen at the offices of Fairbank & Wall, architects, 3, Manor Square, Otley. Sealed and endorsed tenders are to be delivered before 10 a.m. on Nov. 2, to E. C. Newstead, clerk to the Guardians, Union Offices, Boroughgate, Otley.

Nov. 2. Wallsend.—*Erection of Municipal Buildings*. Plans and specifications and conditions can be seen at the offices of, and copies of quantities obtained from, Liddle & Browne, architects, Prudential Buildings, Mosley Street, Newcastle-upon-Tyne. Builders desirous of tendering will be required to deposit with the architects the sum of £3 3s. Sealed tenders, endorsed "Tenders for Municipal Buildings," are to be delivered to W. V. Mulcaster, town clerk of Wallsend, 28, Sandhill, Newcastle-on-Tyne, not later than noon on Nov. 2.

Nov. 3. Footscray, Kent.—*Erection of a new Council school* to accommodate upwards of 300 children in the Longlands District at Footscray, Kent. Plans and specifications may be inspected at the office of C. St. Pierre Harris, A.R.I.B.A., architect, 8, Ironmonger Lane, Cheapside, London, E.C. Any person desiring to tender and to receive a copy of the bills of quantities must send in his name to the architect accompanied by a deposit of £1. Tenders, on the form supplied, are to be delivered to G. F. J. Goodes, Leeds, Hamilton Road, Sidcup, not later than noon on Nov. 3.

Nov. 3. Nordelph.—*Conversion of house into two cottages*; drainage and sub-division of yard and buildings; fencing of grass land at the Chapel Farm, Nordelph. Plans and specifications and conditions of contract may be seen at E. C. Warner's, at Nordelph, who will arrange for inspection of the premises. Tenders, in sealed envelopes, must be delivered to G. C. Davies, deputy clerk of the Norfolk County Council, 11, Prince of Wales Road, Norwich, on or before Nov. 3, and endorsed "Nordelph Tender." Each tender must state within what time the contractor will undertake to complete the work, as time is of importance.

Nov. 5. London, S.W.—1. *Erection of two shelters* in the playgrounds of the Special School, and alterations of playgrounds at the Queen's Road School. 2. Painting of railings round the Dundonald Road School. 3. Painting of external wood and ironwork of the old portion of the Queen's Road School, for the Borough Council of Wimbledon. A plan may be seen at, and specifications and form of tender obtained from, the Education Office, 12, Queen's Road, Wimbledon. Tenders must be delivered to A. Steele Sheldon, clerk, 12, Queen's Road, Wimbledon, by or before 12 noon on Nov. 5.

Nov. 5. Odiham.—*Alterations* at the Odiham Police Station. Persons desirous of tendering may see plan, specification, and conditions of contract, and obtain bills of quantities and all necessary information at the office of W. J. Taylor, county surveyor, the Castle, Winchester, on and after the 22nd Oct., between the hours of 9 a.m. and 5 p.m. (Saturdays 9 a.m. and 1 p.m.). A deposit of £2 2s. will be required for a copy of the bills of quantities. Deposits must be made by cheque payable to Hants County Council, and crossed "Bank of England," or particulars will not be sent. Tenders, endorsed "Proposed Alterations, Odiham Police Station," are to be delivered to H. Barber, clerk of the County Council, the Castle, Winchester, on or before Nov. 5.

Nov. 5. Dublin.—*Erection of a stationmaster's house* at Sixmilecross Station, for the Directors of the Great Northern Railway Co. (Ireland). Parties wishing to tender for the work can see the drawing and specification at the office of W. H. Mills, engineer-in-chief, Amiens Street, Terminus, Dublin, or copies of them at the office of the District Engineer, Belfast, and forms of tender can be obtained at either of the above-mentioned places on payment of 1s. each. Tenders, made out on the forms supplied by the Company, and endorsed, "Tender for Stationmaster's House," should be delivered to T. Morrison, secretary, Secretary's Office. Amiens Street Terminus, not later than 10 a.m. on Nov. 5.

Nov. 6. Mile End, Essex.—*Foundations of the main building* of the new second asylum, near Colchester, to be erected at Mile End, about 1½ miles north of Colchester main-line railway station. Persons desirous of tendering for the work may see the plans, specification, agreement, &c., at the County Asylum Office, 4, Duke Street, Chelmsford, between the hours of 10 and 4 o'clock (except Saturdays), when they will be on view between 10 and mid-day. Contractors must send in their names and addresses at once to W. P. Gepp, clerk to the Visiting Committee, Chelmsford, with a deposit of a cheque or Bank of England note of £20, when a copy of the quantities will be sent. Security to the amount of £2,000 for the due execution of the work must be given as the committee may require by and at the expense of the contractor. Sealed tenders, endorsed "Tender for Foundations, New Second Asylum, Colchester," to be delivered to W. P. Gepp, at his office, not later than Nov. 6.

Nov. 9. Willington.—*Erection of stone walls* to enclose new cemetery ground at Willington, for the U.D.C. Plans and specifications may be seen and all particulars obtained, on making an appointment with the surveyor. Tenders to be delivered to J. G. Wilson, clerk to the Council, 5, North Bailey, Durham, on or before Nov. 9, marked "Cemetery Extension."

Nov. 12. Ashington, New Hirst.—*Erection of new Council school*, to accommodate 680 scholars together with caretaker's dwellinghouse and cookery centre, at Ashington, New Hirst. Contractors desirous of tendering for the work should forward particulars of their name and address to C. Williams, secretary to the Education Committee, Pearl Buildings, Newcastle-on-Tyne, not later than Oct. 27, together with a deposit of £2 2s. Plans of the work may be inspected at the Committee's Offices, and tenders endorsed "Tender for New Hirst Council School," must be forwarded to the Secretary not later than 4 p.m. on Nov. 12.

Nov. 12. Ilford.—*Roofing-in with reinforced concrete* of the septic tanks, &c., at the Outfall Works, Loxford Lane, Ilford, for the R.U.D.C. Plans and specifications may be seen, and form of tender obtained on payment of a deposit of £2 2s., on application to H. Shaw, A.M.I.C.E., engineer and surveyor to the Council, Town Hall, Ilford, during the usual office hours. Sealed tenders, endorsed "Tender for Concreting," must be sent to J. W. Benton, clerk to the Council, Town Hall, Ilford, on or before noon. Nov. 12.

Nov. 12. Epsom.—*Erection of two acute blocks* and the re-building of a nurses' block, at the Manor Asylum, Epsom, Surrey, for the L.C.C. Instructions for tender, and form of tender and contract, with specification, can be obtained from the Clerk of the Asylums Committee, 6, Waterloo Place, London, S.W., upon payment of £5, and the plans may be inspected at the office of the Asylums Engineer, at 6, Waterloo Place, between the hours of 10 a.m. and 4 (except Saturday), and on that day between the hours of 10 and 1 p.m. Tenderers can also obtain from the engineer permission to view the site. Tenders must be on the printed form, accompanied by the form of contract and schedules thereto and forms of bond, and must be enclosed in an envelope, sealed and endorsed "Tender for New Buildings, Manor Asylum," and delivered at the office of the committee not later than noon on Nov. 12. The contractor will have to enter into bonds in the sum of £700 with approved sureties, as security for the performance of the contract. Fair wages clause.

Nov. 14. Glasgow.—*Erection of New Mitchell Library Buildings* in North Street. The Corporation are prepared to receive tenders for (1) the digging, mason, and brick works; (2) the cast-iron and steel work; (3) the fire-proof floors; (4) the wright work; (5) the metal sashes; (6) the roof glazier work; (7) the wood block floors; (8) the slater work; (9) the plumber work and (10) the plaster work. Plans of the proposed buildings may be seen at the office of W. B. Whitie, I.A., 219, St. Vincent Street, Glasgow. Copies of the specifications and forms of tender may be had on application being made in writing to A. W. Myles, town clerk, City Chambers, Glasgow, and on payment of £5 5s. Sealed tenders, marked on the outside "New Mitchell Library—Tender for.................." must be lodged with him on or before 10 a.m. on Nov. 14.

Nov. 14. North Shields.—*Erection of new secondary school* and pupil teachers' centre at Hawkey's Lane, North Shields. Bills of quantities may be obtained on application to J. C. Maxwell, architect, 25, Eldon Square, Newcastle-on-Tyne, where plans and specification may be inspected and further particulars obtained. A deposit of £1 1s. must be made for the quantities. Tenders, sealed and endorsed "Tynemouth Secondary School," must be delivered to the architect at the above-mentioned address not later than Nov. 14.

Nov. 15. Hamworthy.—*Erection of additional buildings* and alterations to the schools at Hamworthy, for the Poole Education Committee. Plans and specifications can be seen at the office of H. F. J. Barnes, architect and surveyor, Towngate Street, Poole. Tenders to be delivered on or before Nov. 15, addressed to C. Lisby, secretary to the Education Committee, Fish Street, Poole, and endorsed "Tender Schools, Hamworthy."

Nov. 15. Belfast.—*Construction of an underground convenience* in Donegall Square, North, for the Police Committee. Drawings, specification, and form of tender may be obtained in the City Surveyor's office on payment of £1 1s. Tenders, endorsed "Underground Convenience," to be lodged with S. Black, town clerk, before 10 o'clock on Nov. 15.

Nov. 20. Cleveleys.—*Erection of new public elementary sclool* at Cleveleys (near Fleetwood) to accommodate 300 scholars, for the Lanchashire Education Committee. The plans may be seen and bills of quantities obtained at the offices of H. Littler, county architect, 16, Ribblesdale Place, Preston, by payment of a deposit of £2. Tenders must be delivered before 12 o'clock noon on Nov. 20, sealed and endorsed, to H. Stonestreet, Education Offices, Blakiston Street West, Fleetwood.

No date. Peterculter.—*Additions to public school, Peterculter*, and carpenter, mason, slater, plaster, plumber, and painter works of caretaker's house, Plans, &c., may be seen, and schedule of quantities obtained, on early application to Wilsons and Walker, architects, 181a, Union Street, Aberdeen.

ENGINEERING.

Oct. 26. Bournemouth.—*Construction of sea-wall, Undercliffe Drive*, and other works in connection therewith, for the Town Council. Full particulars and form of tender can be obtained and plans may be seen at the office of the Borough Engineer, provided that a £10 Bank of England note has been previously deposited with him in respect of such tender. Tenders to be sent in, in envelopes provided for the purpose, to G. W. Bailey, town clerk, Municipal Offices, Bournemouth, on or before 10 a.m. of Oct. 26.

Oct. 27. Heckington.—*Sinking and boring an artesian well* to a total depth of 300ft. or thereabouts, at Heckington for the Sleaford R.D.C. Specifications, schedules, and all other information may be obtained at the office of the Engineer and Surveyor to the Council, W. B. Marsden, 74, Southgate, Sleaford, who by appointment will visit the site with contractors. Tenders, endorsed "Tender for Heckington Water Supply," to be addressed to E. Clements clerk to the Council, 74, Southgate, Sleaford, and sent in on or about 6 o'clock p.m. on Oct. 27.

Oct. 29. Beckenham.—*Supply and erection of an induced draught apparatus* in connection with the Electric Light and Destructor Works, for the U.D.C. Plans, particulars and forms of tender, obtained on application to J. A. Angell, surveyor to the District Council, or J. E. Tapper, electrical engineer, on the production of a receipt from the collector (who attends his office daily from 9 to 10 a.m. only, except on Tuesdays, when his hours are from 9 a.m. to 1 p.m.) for a deposit of £1. Tenders duly sealed and endorsed "Tenders for Induced Draught Apparatus," to reach F. Stevens, clerk of the Council, not later than 4 p.m., Oct. 29.

Oct. 29. Linares.—*Lighting by gas or electricity* the town of Linares. Tenders combining these two systems will also be admitted. The number of lights required will be as follows:—700 lights of 30 candle power, 200 lights of 10 candle power, and 4 lights of 500 candle power. The upset price the municipality will pay is 42,000 pesetas annually. Tenders will be received up to Oct. 29, at the Secretaria del Exemo, Ayuntamiento de Linares, as well as at the Direccion de Administracion, Madrid. Further particulars with regard to the conditions attaching to the contract are contained in the *Gaceta* of Sept. 22, which may be seen at the Commercial Intelligence branch of the Board of Trade, 73, Basinghall Street, London, E.C.

Oct. 29. Erith.—*Supply and erection of* the following plant for the U.D.C.:—Contract No. 1—Water storage tank and supports, water purifying and softening plant, steam feed pump and pipework. Contract No. 2—Removal and re-erection in new building of existing condensers and feed pumps, &c., and pipework. Persons are at liberty to tender for one or both contracts, but not for part of one contract. Copies of the specifications with forms of tender, general conditions and plans may be obtained from C. H. Fry, clerk to the Council, Council Offices, Bexley Road, Erith, on depositing the sum of £5. Plans and specifications can be seen, but not obtained, at the offices of Hawtayne & Zeden, consulting engineers to the Council, 9, Queen Street Place, London, E.C. Tenders sealed and marked "Tender for Electricity Supply Works Extensions," to be addressed to C. H. Fry, and delivered on or before 12 o'clock noon on Oct. 29.

Oct. 30. Norway.—*Supply and erection of about 35 tons of iron bridge work* for the Norwegian Government Commission of Roads and Bridges. Tenders, in sealed envelopes, marked "Anbud paa Jernfagvaerksbro" are to be delivered at "Veidirektorens Kontor, Akers Gade 42lv, Christiania," by midday on Oct. 30. Copies of the general conditions of tender to the Norwegian Government, and the special conditions, form of tender, and specification for the above contract may be seen at the offices of the Commercial Intelligence Branch of the Board of Trade, 73, Basinghall Street, E C.

Oct. 30. Langdon.—*Construction of a covered service reservoir* at Langdon, and the supply, delivery, laying and jointing of about 3 miles 800 yards of 4-in. and 3-in. cast-iron socket pipes with appendages, including all necessary sluice and air valves, hydrants, and other works for the water supply of the town of Beaminster. Drawings, specifications and conditions may be seen at the offices of Messrs. Beesley, Son & Nichols, MM.Inst. C.E., engineers, 11, Victoria Street, Westminster, S.W., where also specifications, bills of quantities, and forms of tender may be obtained on deposit of £5. Copies of the plans and specification may also be seen at the offices of R. Leigh, clerk to the Beaminster Rural District Council, Beaminster, Dorset (Saturdays excluded). Sealed tenders addressed to R. Leigh, and endorsed "Beaminster Waterworks," "Contract No. 2," are to be delivered before 10 a.m. on Oct. 30.

Oct. 31. Pontevedra.—*Supplying electric light* to the town of Pontevedra for a period of 15 years from 12th April, 1908. The upset price the municipality will pay is 20,000 pesetas annually. Tenders will be received up to 11 a.m. on Oct. 31, at the Palacio Municipal, Pontevedra, and at the Direccion General de Administracion Local at Madrid. The *Gaceta* of Sept. 21 contains further information as to the terms of the contract, as well as a copy of the form of tender, which may be seen at the Commercial Intelligence Branch of the Board of Trade, 73, Basinghall Street, London, E.C.

Oct. 31. Portaferry.—*Construction of a pier* at Portaferry, in accordance with the drawings and specifications of the County Surveyor, at a cost not exceeding £450, for the Council of the Administrative County of Down. Copies of the plans and specifications can be seen at the County Courthouse, Downpatrick, on any week day, between 10 a.m. and 5 p.m. Tenders must be sent in on forms obtained of R. MacIlwaine, secretary to the County Council, Council Offices, Courthouse, Downpatrick, and are to be endorsed "Tender for Portaferry Pier." Such tenders will be received until 3 p.m. on Oct. 31, and parties sending in tenders will require to be in attendance, with two sufficient sureties, at the Council Chamber, Courthouse, Downpatrick, on Nov. 1, at 10.30 a.m., to enter into a bond for the due performance of the work.

Nov. 5. Portsmouth.—*Supply, provision, erection, setting to work, and maintenance* of electrically-driven centrifugal storm water pumps, with their switchgear and the accessaries of the whole or any of them, to be erected in an underground pumping station to be built on Southsea Common. Specifications and forms of tender may be obtained from the Town Clerk on payment of a sum of £2 2s., and the drawings may be seen and full information supplied upon application at the offices of Bramwell & Harris, 5, Great George Street, Westminster, S.W. Tenders under seal and endorsed "Tender for Works for the Prevention of Storm Water Flooding in the low lying area of Southsea.—Contract No. 1," must be delivered to Hellard, town clerk, Town Hall, Portsmouth, on or before 12 o'clock on Nov. 5.

Nov. 6. Peoria, Illinois.—*Construction of the superstructure work* of a Scherzer rolling lift bridge across the Illinois River at Peoria, Illinois, will be received until 12 o'clock, Nov. 6. Plans can be examined and specifications and blank forms for proposals can be obtained at the office of E. A. Furry, Commissioner of Public Works, Peoria, Illinois, or at the office of the Scherzer Rolling Lift Bridge Company, Monadnock Block, Chicago, Illinois.

Nov. 12. Yorkhill.—*Construction of about 1,164 lineal yards of quayage*, at Yorkhill, on North Side of the Harbour of Glasgow, for the Trustees of the Clyde Navigation, the work embracing quay walls on monolith foundations, ordinary quay walls, timber wharf, ferro-concrete wharf, and nearly 300,000 cubic yards of excavation. The drawings may be seen, and specification, schedule of quantities and form of tender obtained on application to W. M. Alston, the trustees' engineer, 16, Robertson Street, Glasgow, on a deposit of £5 5s. Sealed tenders, marked "Tender for Yorkhill Basins and Quays," to be lodged with T. R. Mackenzie, general manager and secretary, 16, Robertson Street, Glasgow, not later than 10 a.m. on Nov. 12.

Nov. 20. Winnipeg.—*Erection of steel superstructure for highway bridge* over the Red River, at Redwood Ave., Winnipeg. Sealed proposals addressed to Alderman J. G. Latimer, Chairman, Committee on Works, will be received at the office of C. J. Brown, city clerk, City Clerk's Office, Winnipeg, up to 2.30 p.m. on Nov. 20. Plans, specifications and forms of proposal may be obtained at the office of Col. H. N. Ruttan, city engineer, Winnipeg, Canada. Each bid must be accompanied by an accepted cheque or draft payable to the order of the City treasurer, or cash deposit for a sum equal to 5% of the total amount of the bid, which will be subject to forfeiture in case of failure on the part of the contractor to enter into a written contract with approved sureties if called upon to do so.

Nov. 21. Brockton, Mass.—*Furnishing and erecting complete*, on foundations furnished by the city one vertical triple-expansion condensing, crank and flywheel pumping engine of six million gallons daily capacity. Sealed proposals, endorsed "Proposals for Pumping Plant," will be received at the office of the Water Commissioners, City Hall, Brockton, Mass., until 12 o'clock noon on Nov. 21. Each proposal must be accompanied by a certified cheque drawn and made payable to the City of Brockton, for the amount of 1,000 dols. Proposals must be made on blank forms furnished by the Water Commissioners. Blank proposals and specifications and further information will be furnished on application to the Water Commissioners.

IRON AND STEEL.

Nov. 10. Accrington.—*Supply of about 1,350 tons of steel tramway rails*, together with the necessary fish-plates, &c., for the Tramway Committee. Specifications, form of tender and other particulars may be obtained on application to the Borough Engineer, W. J. Newton, Assoc.M.Inst.C.E., Town Hall, Accrington, on payment of a deposit of £2 2s. Sealed tenders, endorsed "Tramway Rails," to be delivered to A. H. Aitken, town clerk, Town Hall, Accrington, not later than Nov. 10.

Nov. 12. Holyoke, Mass.—*Supplying 139 net tons of 20-in.*, 281 net tons of 16-in. and 32 net tons of 12-in. cast iron water pipe and 20,000 lbs. of special castings. Tenders will be received at the office of the Board of Water Commissioners, Room 8, City Hall, Holyoke, Mass., until 7.30 p.m. on Nov. 12. Specifications and proposal forms may be obtained on application.

No date. London.—*Supply and erection* of the steel skeleton framing of a proposed factory in London, 410ft. long, 86ft. wide, and six storeys high. Persons desirous of tendering please apply to R. Anderson, architect, 39, Victoria Street Westminster, for copy of drawings and particulars, which will be supplied on a deposit of £2 2s. Only a limited number will be issued.

PAINTING AND PLUMBING.

Nov. 1. Monkwearmouth.—*Painting* of the Monkwearmouth Car Depot. Specification and form of tender may be obtained on application to the General Manager, at his office, Wheat Sheaf Corner, Monkwearmouth. Tenders in a sealed envelope, endorsed "Tender for Painting Monkwearmouth Car Depot," must be delivered to F. M. Bowey, town clerk, Town Hall, Sunderland, not later than 12 noon on Nov. 1.

ROADS AND CARTAGE.

Oct. 27. Shoreham.—*Hire of steam roller* in November for the New Shoreham U.D.C. Particulars and forms of tender can be obtained from A. W. Nye, town surveyor, Town Hall, Shoreham. All tenders to be delivered to H. Brown, clerk to the Council, Council Offices, Shoreham, on or before Oct. 27.

Oct. 27. Johnstone.—*Supplying all labour and material required in causewaying streets* within the Burgh. Schedules and all information can be had on application to J. Stevenson, Burgh surveyor, Johnstone. A fee of £1 will be charged for schedules. Schedules to be returned on or before Oct. 27.

Oct. 27. Shoreham.—*Supply of about 500yds. of hand-picked surface flints* broken to pass through a 2-inch ring for the New Shoreham U.D.C., to be delivered about middle of November in quantities of not less than 40 yds. per day. Further particulars and forms of tender can be obtained from A. W. Nye, town surveyor, Town Hall, Shoreham. All tenders to be delivered to H. Brown, clerk to the Council, Council Offices, Shoreham, on or before Oct. 27.

Oct. 29. Birmingham.—*Excavating, laying concrete foundation and paving* with granite setts and wood the carriage-ways of Farm Street (part of) and Dartmouth Street (part of). The granite setts and wood blocks will be provided by the Corporation. The drawings and specification may be inspected, and quantities and forms of tender obtained, on deposit of £2, with H. E. Stilgoe, M.Inst.C.E., city engineer and surveyor, The Council House, Birmingham. Fair wages clause. Tenders, sealed and endorsed "Tender for Paving Farm Street and Dartmouth Street," to be delivered at the City Surveyor's Office, Council House, on or before Oct. 29.

Oct. 29. Beckenham.—*Making-up the following roads* for the U.D.C.:—Sidney Road, 270yds. in length; Kendall Road, 170yds. in length; Stembridge Road, 20yds. in length; Blandford Road, 1,100yds. in length; Alexandra Road (part of) 120yds in length. The works comprise about 450 lin. ft. Norwegian granite kerb, 2,550 lin. ft. granite kerb re-laid on concrete, 3,000 lin. ft. Aberdeen or Guernsey pitched channelling, 150 cub. yds. hardcore, 1,000 cub. yds. flints, 5,000 sup. yds. red brick paving, together with the remodelling of 1,680 lin. yds. of roadway and other works incidental thereto. Plans and sections may be seen, and bills of quantities, specifications, and forms of tender obtained, on application to J. A. Angell, surveyor, on the production of a receipt from the collector for a deposit of £2. Fair wages clause. Payment, under the contract, will not be made until six months after the completion of the works. Tenders, duly sealed and endorsed "Tenders for Street Works," to reach F. Stevens, clerk to the Council, not later than 4 p.m. on Oct. 29.

Oct. 30. Farnham.—*Supply and delivery in 50-ton lots* at Farnham, Surrey, Railway Station, of about 800 tons of Quenast granite, broken to pass a ring of 1½ins. internal diameter, for the U.D.C. Tenders to be on forms to be provided by the Council, which forms may be had on application to R. W. Cass, Council's surveyor, Council Offices, South Street Each tender must be accompanied by a sample of the granite tendered for, the said sample to be descriptive of breaking and size as well as of quality. Sealed tenders on prescribed form, sealed and endorsed "Tender for Granite" on outside cover, to be delivered to R. Mason, clerk, 93, West Street, Farnham, on or before 4 o'clock p.m. on on Oct. 30. The Council are also prepared to consider, under the conditions as to tendering, above stated, tenders for the supply and delivery of Guernsey granite.

Nov. 3. Harrow-on-the-Hill.—*Supply of a 10-ton compound steam road-roller*, for the U.D.C. Tenders, with specification and full particulars, and time required for delivery, to be sent to J. Strachan, clerk, on or before Nov. 3.

Nov. 3. Chingford.—*Making-up, paving, kerbing, channelling, &c.*, the Woodland Road, within the district of Chingford, in accordance with plans and specifications prepared by the Council's surveyor, copies of which may be obtained on application and upon payment of a deposit of £2 2s. The contractor will be required to enter into a bond for the due performance of the contract, and to undertake to carry out the work when the sanction to the loan for the same has been obtained from the Local Government Board. Tenders, which are to be sealed and endorsed "Tender for Private Street Works," to be delivered to L. C. Bowen, clerk to the Council, at the Council Offices, Chingford, not later than 12 o'clock noon on Nov. 3.

Nov. 6. Wembley.—*Making-up of Swinderby and parts of Eagle Roads* in the Urban District of Wembley. The drawings and specifications may be seen at the office of C. R. W. Chapman the surveyor to the Council, at the Public Offices, Wembley. A copy of the quantities, with form of tender attached, may be obtained of F. W. Rodd, clerk to the Council, Public Offices, Wembley, upon payment of a deposit of £3 3s. Sealed tenders, in the envelope provided, must be delivered to him not later than 6 p.m. on Nov. 6.

SANITARY.

Oct. 29. Skipton.—*Supply and fixing complete* of 5 revolving distributors of 60 feet diameter each for the U.D.C. Specification and full particulars may be obtained on application to J. Mallinson, engineer to the Council, Town Hall, Skipton. Sealed tenders, endorsed "distributors," are to be delivered to him not later than Oct. 29.

Oct. 31. Lowestoft.—*Construction of two additional cells* and the necessary structural alterations that may be required to the destructor, for the Town Council. Firms wishing to tender can obtain a ground plan of the existing works and all other information upon application to G. H. Hamby, A.M.I.C.E., borough surveyor, Town Hall, Lowestoft. The tenders, under cover, sealed. and addressed to the Chairman of the Sanitary Committee, to be sent in to the Borough Surveyor not later than Oct. 31.

Nov. 5. Basford.—*Sewerage and sewage-disposal works* for the Jubilee District, in the Parish of Selston, for the R.D.C. The contract comprises the laying of 6-in. pipe sewers, with manholes and other appurtenant works, and the construction of small septic tank and percolating filters, &c. Plans may be at the office of Sands, Walker, and Maylan, joint engineers, Milton Chambers, Milton Street, Nottingham, and copies of specification and quantities can be obtained on payment of £2 2s. (by cheque). The successful contractor will be required to enter into a bond, with approved sureties, for the due performance of his contract. Sealed and endorsed tenders to be sent to C. J. Spencer, clerk to the Council, Public Offices, Basford, Nottingham, on or before Nov. 5.

Nov. 5. Greenville, Ala.—*Construction of 3 to 4 miles of pipe sewers*, with the necessary manholes and flush tanks, at Greenville, Ala. Sealed tenders will be received until 2 p.m. on Nov. 5. Plans may be seen at the office of A. Pew, consulting engineer, Atlanta, Ga., and at the office of the City Clerk at Greenville. For specifications, apply to T. W. Peagler, city clerk, Greenville, Ala.

Nov. 5. Settle.—*Taking out old sewers* and the construction of about 1,753 lineal yards of 9in. internal diameter new sewer of earthenware and cast-iron pipes, together with the necessary manholes, inspection shafts, ventilators, &c., for the R.D.C. The drawings, specifications, and conditions may be seen, and bills of quantities obtained, at the offices of R. B. Broster & Sons, engineers, Craven Bank Chambers, Keighley. A payment of £1 1s. will have to be made to the engineers by each applicant for quantities. Sealed tender, endorsed "Intercepting Sewer," to be enclosed in envelope supplied, and forwarded to T. E. Pearson, clerk to the Council, Town Hall, Settle, not later than 12 o'clock at noon on Nov. 5.

Nov. 5. Elstead, near Godalming.—*Erection of sanitary outbuildings* at Elstead; near Godalming, for the managers of the Elstead schools. Plans and specification may be seen and quantities obtained at the office of T. A. and A. W. Mellersh, surveyors, Godalming, where tenders are to be delivered on or before Nov. 5, endorsed "Tender, Elstead school."

Nov. 8. Uxbridge.—*Construction of the following works* adjoining the Frays River, in the parish of Yiewsley, close to West Drayton Station, G.W.R. :—Brick and concrete retaining walls, three small coke filters, forming concrete bed to bottom of beck, the laying of a short length of cast-iron effluent drain under bed of river, clearing and removing mud, &c., for certain small tributary streams, and other appurtenant works for the R.D.C. Plans may be seen, and bill of quantities, form of tender, and specification obtained, on application to J. Freebairn Stow, engineer, Engineer and Surveyor's Office, Corn Exchange, Uxbridge, on payment of £3 3s. Tenders endorsed "Frays Drainage Works," are to be delivered to him not later than 4 p.m. on Nov. 8.

Nov. 8. Uxbridge.—*Construction of a 9in. stoneware pipe sewer*, with necessary manholes, &c., in road adjoining High Street, Harefield, near Uxbridge, Middlesex, for the R.D.C. Plan and specification may be seen and form of tender obtained on application to J. Freebairn Stow, engineer, Engineer and Surveyor's Office, Corn Exchange, Uxbridge, to whom tenders, endorsed "Harefield Sewers," are to be delivered not later than 4 p.m. on Nov. 8.

TIMBER.

Oct. 29. West Ham.—*Supply of timber* for use in the manual instruction centres under the control of the Council, from Nov. 1, 1906, to March 31, 1908, for the Education Committee of the County Borough. Forms of tender and copy of specification may be obtained of F. E. Hilleary, 95, The Grove, Stratford, E. Tenders for this contract (in the envelopes supplied) must be returned not later than 12 noon on Oct. 29. The contractor will be required to enter into a bond with sureties for the due performance of the contract, and no timber will be ordered under any contract until such bond has been duly executed. Fair wages clause.

MISCELLANEOUS.

Oct. 31. London, E.C.—*Supply and delivery* of :—(1) Wheels and axles for carriages; (2) pig iron; (3) globes and carbons for arc lamps, for the East Indian Railway Company, as per specifications to be seen at the company's offices. Tenders to be sent to C. W. Young, secretary, Nicholas Lane, London, E.C., marked "Tender for Wheels and Axles," or as the case may be, not later than 12 noon on Oct. 31. Fees are charged for the specifications as follows: For Nos. 1 and 2, £1 1s. each, and for No. 3, 10s. 6d.

Nov. 2. Manchester.—*Supply of permanent way materials*, for about 20 miles of single line, for the South Yorkshire Joint Railway Committee. Steel rails (95 B.S.), steel fishplates, cast-iron road chairs, wrought-iron spikes, wrought-iron bolts and nuts, redwood sleepers, oak keys, oak treenails. Further particulars, with specifications and forms of tender, for each of which a charge of £1 1s. will be made, may be obtained at the office of E. Parry, M.Inst.C E., engineer, 13, Victoria Street, Westminster, S.W. Sealed tenders, marked "Tender for———." to be sent in to the secretary of the South Yorkshire Joint Line Committee, Hunt's Bank, Manchester, before 10 o'clock in the morning of Nov. 2.

Nov. 5. London.—*Supply of brass and gunmetal goods*, gas and plumbers' fittings, cast-iron, electric fittings, cables, engineers' goods, wrought iron tubing, firewood, oak pales and posts, iron and steel, oils, tools and implements, and tramway car fittings, for one year from 1st Jan., 1907, for the L.C.C. Full particulars and also information as to the conditions to be observed by tenderers is given in the London County Council *Gazette*, of Oct. 22 (price 1d., post free 1½d.), which can be obtained from P. S. King & Son, 2 and 4, Great Smith Street, Westminster, S.W. Tenders must be upon the official forms, to be obtained on personal application or by sending a stamped addressed foolscap envelope to the Clerk of the Council, County Hall, Spring Gardens, S.W., and no tender will be received after 10 a.m. on Nov. 5.

TOO LATE FOR CLASSIFICATION.

Oct. 29. Kells, Co. Meath.—*Erection of additions, &c.*, to the Parochial House, Kells, Co. Meath, for the Very Rev. Dr. Dooley, P.P., V.F. Plans and specification can be seen at the offices of the architects, 50, Dawson Street, Dublin, and at the Parochial House, Kells. Tenders to be posted not later than Oct. 29, and addressed to the Very Rev. Dr. Dooley, P.P., V.F., Kells.

Oct. 29. Belfast.—*Slating the roof* of the extension of the new motor-car shed at Belfast terminus, for the Great Northern Railway Co. (Ireland). Parties wishing to tender for the work can see the drawing and specification at the office of W. H. Mills, engineer-in-chief, Amiens Street Terminus, Dublin, or copies thereof at the offices of the District Engineer, Belfast, from either of whom forms of tender can be obtained on payment of 1s. each. Tenders made out on the forms supplied by the company and endorsed "Tender for Slating," should be delivered to T. Morrison, secretary, Secretary's Office, Amiens Street Terminus, Dublin, not later than 10 a.m. on Oct. 29.

Oct. 31. Belfast.—*Alterations to Peter's Hill Baths.* Drawings and specification may be seen, and form of tender obtained, in City Surveyor's office. Sealed tenders, endorsed "Alterations to Peter's Hill Baths," to be lodged with S. Black, town clerk, before 10 a.m. on Oct. 31.

Nov. 2. Linlithgow.—*Erection of staircase* (mason work) in front of the old Town Hall, Linlithgow, for the C.C. Plans to be seen with, and schedules of quantities obtained from, Wm. M. Scott, architect, Linlithgow, on payment of a fee of £1 1s. Sealed tenders to be lodged with J. G. B. Henderson, county clerk, Linlithgow, by Nov. 2.

Nov. 3. Lancaster.—*Erection of new bank and residence*, Fleetwood, for the Lancaster Banking Co., Ltd. Plans and specifications may be seen at the Bank, Fleetwood, and at the office of the architects. Bills of quantities may be obtained on application to Austin and Paley, architects, or to Messrs. Wright & Son, surveyors, Lancaster. Tenders to be delivered (under cover) to the architects not later than noon, Nov. 3.

Nov. 3. Dublin.—*Erection of new clearstory, apse and sacristies* to St. Peter and Paul's Church, Clonmel, for the Very Rev. Canon Flavin, P.P., according to the designs, &c., prepared by Ashlin and Coleman, architects, 7, Dawson Street, Dublin. Bills of quantities have been prepared for the work by D. W. Morriss, surveyor, 68, Harcourt Street, Dublin, and can be obtained from him. The plans, &c., can be seen at the architects' offices, and at the Presbytery, Clonmel. Sealed tenders, addressed to the architects, to be delivered at the architects' offices, not later than 12 o'clock afternoon, on Nov. 3.

Nov. 9. Uddingston.—*Construction of an outfall sewer*, about one mile in length, from the junction of the Myres Burn with the Powburn to Powburn Toll. Plans may be seen, and copies of the specification and schedule of measurement obtained, at the office of W. L. Douglass, C.E., district engineer, district offices, Hamilton, on payment of £1. An assistant engineer will meet intending contractors at Uddingston West Station (North British Railway) at 10.22 a.m. on Oct. 25. Sealed tenders, endorsed on outside "Tender for Outfall Sewer," must be lodged with the Clerk to the Subcommittee, J. Cormack, Bank of Scotland, Uddingston, not later than 10 a.m. on Nov. 9.

Nov. 17. Ynyshir, Rhondda.—*Erection of a minister's house* at Station Road, Ynyshir. Plans and specifications may be seen, and tenders must be sent on or before Nov. 17 to E. Thomas, 16, South Street, Ynyshir.

New London Buildings

At yesterday's meeting of the London County Council the Building Act Committee reported the following applications under the London Building Act, 1894, their recommendations as to consent or refusal being appended in *italics :*

Coal store on the western side of Iffley Road, Hammersmith. *(Rescission of resolution.)*

Addition to a coach-house on the eastern side of Shepherd's Walk, Rosslyn Hill, Hampstead, with a boundary wall at less than the prescribed distance from the centre of Shepherd's Walk, on the application of F. R. Hasluck, on behalf of W. Clark. *(Consent.)*

Building on the northern side of Broughton Road, westward of Stephendale Road, Fulham, on the application of Loud & Western, Ltd. *(Consent.)*

Building upon the site of No. 171, Lower Clapton Road, Hackney, on the application of J. Hamilton, on behalf of F. Sharman. *(Consent.)*

Porch at No. 2, West Hill Sydenham, on the application of J. & C. Bowyer, on behalf of Dr. A. Melvill Green. *(Consent.)*

Additions in front of Nos. 4, 6, 8 and 10, Loampit Vale, Lewisham, on the application of J. Webster, on behalf of E. A. Woollett. *(Consent.)*

Addition to the porch in front of No. 41, Upper Brook Street, St. George, Hanover Square, on the application of R. S. Wornum, on behalf of L. Clow. *(Consent.)*

Buildings on the southern side of Swain's Lane, Highgate, westward of Brookfield Park, to the line in Swain's Lane, on the application of Thurgood & Martin, on behalf of Burdett-Coutts, M.P. *(Consent.)*

Buildings upon a site upon the northern side of Westmoreland Road, Walworth, to abut upon Horsley Street, on the application of E. Bates, on behalf of T. W. Dobson. *(Consent.)*

Buildings on the eastern side of the Mitcham Road, Tooting, at the corner of Back (or Rectory) Lane, on the application of W. J. Janes, on behalf of R. H. Miller. *(Consent.)*

Greenhouse on the north-western side of Magdalen Road, Wandsworth, at the rear of a horticultural show house on the western side of Trinity Road, on the application of A. Southam, on behalf of R. Neal. *(Consent.)*

Retention of a projecting oriel window in front of No. 16, Kensington Gore, Westminster, on the application of W. Flockhart, on behalf of J. B. Gray. *(Consent.)*

Addition at the flank of No. 108, Bargery Road, Catford, to abut upon Thornsbeach Road, on the application of Norfolk & Prior, on behalf of J. Watt. *(Refusal.)*

Addition to the balcony on the Victoria Embankment frontage of the Savoy Hotel, Strand, on the application of Collcutt & Hamp, on behalf of the Savoy Hotel Co. *(Refusal.)*

Roof over a portion of the yard at Gibbs & Son's premises, Decima Street, Bermondsey, such yard being at less than the prescribed distance from the centre of the roadway of the street, on the application of E. Cross & Co., on behalf of G. Gibbs & Son. *(Consent.)*

Addition to building at "Northcourt," Hampstead, with the forecourt boundary fence at less than the prescribed distance from the centre of the roadway of College Villas Road, to be used as a petrol pit, on the application of Hudson & Hart, on behalf of W. Scott. *(Consent.)*

Retention of a forecourt fence wall in front of a proposed two storey building to the eastward of No. 1A, Barnsbury Square, Islington, at less than the prescribed distance from the centre of the roadway of the street, on the application of F. J. Eedle & Meyers, on behalf of T. Heath. *(Consent.)*

One-storey addition at the rear of the "Windsor" public-house, No. 427, Strand, at less than the prescribed distance from the centre of Harvey's Buildings, on the application of H. G. Leslie. *(Refusal.)*

Two-storey building at the rear of No 202, High Street, Tooting, to abut upon Blackshaw Road, on the application of W. C. Poole, on behalf of W. J. Hyde. *(Consent.)*

Building on the northern side of Amhurst Park, Stamford Hill, to abut upon the eastern side of Holmdale Road, on the application of S. C. Rookwood, on behalf of H. Chambers. *(Refusal.)*

Iron and glass shelter in front of the Queen's Theatre of Varieties, High Street, Poplar, on the application of A. Ritchie & Co., on behalf of F. and M. Abrahams. *(Refusal.)*

Formation or laying-out of new streets for carriage traffic to lead out of the north side of Streatham Common north to Deepdene Road, Wandsworth, and in connection therewith the widening of portions of Streatham Common north and Deepdene Road, so far as relates to (*a*) an alteration in the position of the streets marked "No. 1 road" and "No 2 road"; (*b*) an alteration in the position of the two pieces of land to be reserved at the northern ends of the streets marked "No. 1 road" and "No. 2 road"; and (*c*) an alteration in the gradients of the three streets sanctioned, on the application of W. N. Dunn. *(Consent.)*

Re-erection of No. 78, Wigmore Street, St. Marylebone, on the application of Treadwell & Martin. *(Consent.)*

Uniting of No. 56 & 58, Moorgate Street, City, with a building on the southern side of Cross Kev Court, without requiring the floors of Nos. 56 and 58, Moorgate Street, to be made fire-resisting, on the application of W. T. Walker, on behalf of G. J. Mathieson. *(Consent.)*

Additional storey to Iddesleigh Mansions, Caxton Street and Palmer Street, Westminster, on the application of H. A. Luke, on behalf of W. A. Fleming. *(Consent.)*

Buildings upon a site on the western side of Goswell Road, Finsbury, to abut upon the southern side of Compton Street, with irregular open spaces about such buildings, on the application of E. S. Underwood, on behalf of G. Redhouse. *(Refusal.)*

Current Market Prices.

FORAGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	2	0	1	13	0
Clover, best...	per load	4	7	0	4	17	6
Hay, good	do.	4	0	0	4	5	0
Sainfoin mixture	do.	4	0	0	4	7	6
Straw...	do.	1	8	0	1	14	0

METALS.

		£	s.	d.	£	s.	d.
Standard Copper	per ton	99	0	0	100	0	0
Do. Strong sheets ...	do.	115	0	0	116	0	0
Lead, soft foreign...	do.	19	15	0	20	0	0
Do. English	do.	20	10	0	20	15	0
Do. pipes...	do.	22	15	0	23	0	0
Do. sheets	do.	22	5	0	22	10	0
Galvanised Corrugated sheets	do.	12	15	0	13	0	0
Spelter G.M.	do.	25	15	0	26	0	0
Angles, Scotland	do.	6	15	0	6	17	6
Bars, do.	do.	7	15	0	8	0	0
Marked bars, Staffs. ...	do.	8	10	0	8	12	6
Common bars, do. ...	do.	6	15	0	6	17	6
Angles, M'boro.	do.	6	10	0	6	12	6
Joists. M'boro	do.	6	5	0	6	7	6
Angles, Midlands	do.	6	12	6	6	15	0
Joists do.	do.	6	17	6	7	0	0
Girder plates, Midlands ...	do.	7	10	0	7	12	6
		£	s.	d.	£	s.	d.
Angles, Foreign, c.i.f. Thames	per ton	6	10	0	6	12	6
Tees do. do. do.	do.	6	10	0	6	12	6
Joists, do. do. do.	do.	6	5	0	6	7	6
Channels do. do. do.	do.	6	10	6	6	12	6
Plates do. do. do.	do.	7	5	0	7	7	6
Tin, Foreign	do.	198	0	0	199	0	0
Do. English ingots ...	do.	198	0	0	199	0	0
Zinc, sheets, Silesian, f.o.b.	do.	32	0	0	32	5	0
Do. do. V.M. do.	do.	32	5	0	32	10	0

TIMBER.

		£	s.	d.	£	s.	d.
Deals, Archangel, Yellow, 2nd, 3×9	per std.	15	5	0	—		
Do. do. do. 3rd, 3×9	do.	9	15	0	11	0	0
Do. do. do. 4th, 4×11	do.	9	5	0	—		
Do. do. White, 2nd, 3×9	do.	10	5	0	10	10	0
Do. Kramfovs, Yellow, 5th, 2½×7	do.	9	0	0	—		
Do, Kovda, Yellow, 3rd, 3×9	do.	10	15	0	—		
Do. Montreal, Spruce, 5th, 3×9	do.	7	15	0	—		
Do. Lulea, Yellow, 2nd, 3×9	do.	9	5	0	—		
Do. do. do. 3rd, 3×9	do.	8	5	0	—		
Do. Nederkalix, Yellow, 1st, 3×9	do.	11	0	0	—		
Do. do. do. 2nd, 3×9	do.	9	0	0	—		
Do. St. Petersburg, Yel- 3rd, 3×11	do.	8	0	0	—		
Do. do. do. do. 3×9	do.	8	0	0	—		
Do. do. do. do. 2½×7	do.	3	15	0	9	5	0
Do. do White do. do.	do.	8	10	0	—		
Do. Soroka, Yelow, 3rd, 3×11	do.	9	15	0	—		
Do. Skutskav, mixed Yellow, 2½×7	do.	13	15	0	—		
Do. Soderhamn, White inferior 5th, 2½×7	do.	8	0	0			
Do. Stugsund, Yellow and White, 5th, 3×9	do.	7	5	0	—		
Do. Umba, Yellow, unsorted, 3×9	do.	9	10	0	—		
Battens, Arendal, Yellow, unsorted, 2×4	do.	8	15	0	—		
Do. Christiania, White, unsorted, 2×4	do.	8	0	0	—		
Do. Nederkalix, Yellow, 3r , ¾×8	do.	8	5	0	—		
Do. Lulea, Yellow, 1st, 2×7	do.	9	10	0	—		
Do. do. do. 2nd, 2×9	do.	9	10	0	—		
Do. do. do. do. 2×7	do.	9	5	0	—		
Do. Lapperk, Yellow, 1st and 2nd, 2×5	do.	8	15	0	—		
Do. do. do. do. 2×3½	do.	8	15	0	—		
Do. Riga, White, unsorted, 1×9	do.	9	0	0	—		
Do. St. Petersburg, White, 3rd, 2½×6	do.	8	0	0	—		
Do. do. do. do. 1×5	do.	7	15	0	—		
Do. Soderhamn, White, inferior 5th, 2½×6	do.	7	15	0	—		
Do. Wyburg, Yellow, 1st, 2½×6½	do.	8	15	0	—		
Do. do. do. do. 2 ×6	do.	8	10	0	—		
Do. do. do. do. 2½×5½	do.	8	5	0	—		
Do. do. do. 2nd, 2½×6½	do.	8	0	0	—		
Do. Wifstawarf, Yellow, unsorted, 2×4½	do.	9	5	0	—		
Flooring Boards. Gothenburg, Yellow, dry 3rd, 1¼×7	do.	0	12	0	—		
Do. Mon. Yellow, 3rd 1×6	do.	0	9	0	—		
Do. Sundswall, Yellow 3rd, 1¼×5½	do.	0	12	0	—		
Do. Skonvik, Yellow, 1st, 1×6	do.	0	11	0	0	10	3
Do. Wifstawart, Yellow, superior 1st and 1st, 1×6½	do.	0	11	3	—		

Coming Events.

Friday, October 26.

ROYAL SANITARY INSTITUTE.—Mr. A. Saxon Snell, F.R.I.B.A., on "Ventilation, Warming and Heating," at 7 p.m.

Saturday, October 27.

ROYAL PHOTOGRAPHIC SOCIETY.—Mr. S. G. Kimber on "Winchester Cathedral," New Gallery, at 8 p.m.

ARCHITECTURAL ASSOCIATION RIFLE CLUB.—Inauguration by Major-General Lord Cheylesmore, at London Scottish R.V. Headquarters, 59, Buckingham Gate, S.W., at 3.30 p.m.

Monday, October 29.

ROYAL SANITARY INSTITUTE.—Mr. W. C. Tyndale. M.I.C.E., on "House Drainage," at 7 p.m.

Tuesday, October, 30.

ARCHITECTURAL ASSOCIATION OF IRELAND.—Mr. J. A. Gotch, F.R.I.B.A., on "The Development of Domestic Architecture from 1200 to 1800," at 8 p.m.

Wednesday, October 31.

ARCHITECTURAL ASSOCIATION (Discussion Section)—Mr. G. M. Nicholson, F.S.I., on "Quantities and Cost," at 7.30 p.m.

Friday, November 2.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—President's address.

ROYAL SANITARY INSTITUTE.—Dr. James Kerr, M.A., on "Physical Conditions Affecting Health in Schools," at 7 p.m.

Monday, November 5.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—Opening Meeting: Presidential Address, by T. E. Collcutt, F.R.I.B.A. at 8 p.m.

Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, *Great New Street, Fetter Lane, E.C.*

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Ashorne (Leamington).—For the pulling down of the existing premises and rebuilding "The Cottage Tavern," at Ashorne, near Leamington, for Messrs. Lucas & Co., Ltd. Mr. C. M. C. Armstrong, architect, Warwick:—

B. & F. Bradshaw, Leamington ...	£996	12	0
T. Bailey Leamington	879	0	0
G. F. Smith & Son, Leamington ...	866	0	0
A. E. Sheasby,* Barford	838	9	4

* Accepted.

Burghill, Hereford.—For additions to Burghill Church. Messrs. Groome & Bettington, architects, Palace Chambers, Hereford:—

W. P. Lewis & Co.	£37	0	0
W. Bowers & Co.	36	4	0
E. W. Wilks*	33	0	0

* Accepted.

Burton-on-Trent.—Accepted for converting Wellington Street School into a pupil teachers' centre and cookery centre, for the Burton Education Committee:—

R. Kershaw, Burton...	£1,220	0	0

Deal.—For the erection of a new school to accommodate 240 infants. together with boundary walls and other site works for the Education Committee. Mr. Charles L. Crowther, architect, Queen Street, Deal:—

J. E. Turner Walmer	£3,664	16	0
A. E. Goodbourne, Ramsgate	3,610	8	0
E. Bowles, Ashford	3,491	10	0
W. W. Martin, Ramsgate...	3,366	0	0
Gann & Co., Whitstable	3,324	0	0
Harris & Son, Marlow-on-Thames...	3,312	17	0
G. Mi iams, Ramsgate	3,245	0	0
J. W. Woodhall & Son, Ramsgate...	3,200	0	0
E. Trevers, Deal	3,150	3	0
S. & R. Jefford, Walmer	3,133	7	0
Sturry Building Co., Sturry	3,120	0	0
H. E. Phillips, Gillingham	3,090	0	0
Turner & Watts, Sandwich	£3,075	0	0
G. Lewis & Sons, Dover	3,028	10	0
T. T. Denne, Walmer	2,997	0	0
Hayward & Paramor, Folkestone ...	2,988	0	0
A. W. Thompson, Walmer	2,980	0	0
W. Judges, Boughton...	2,942	0	0
G. Browning, Canterbury...	2,931	0	0
W. H. Grigg, Dover	2,906	0	0
G. B. Cottew, Deal	2,799	0	0
J. Wise, Deal	2,716	0	0

Dorchester.—For the erection of a Roman Catholic church in Alington Street. Messrs. A. J. Scoles and G. Raymond, architects, Presbytery, Basingstoke:—

C. Trask & Sons	£2,475	10	0
Bird & Pippard	1,690	0	0
C. E. Slade	1,666	0	0
Watts Bros.	1,451	0	0
R. Davis & Son	1,398	10	0
J. W. & H. Childs,* Yeovil	1,347	0	0

* Accepted.

Hove.—Accepted for the construction of a brick sewer in Langdale Road, concrete and stoneware pipe sewers in New Church Road and Wish Road, and other works, for the Hove Town Council. Mr. Hugh Hamilton Scott, borough surveyor:—

J. Parsons & Sons, 176, Church Rd. Hove £3,646.

Kirtlington (Oxford).—For the conversion of building into estate office for Sir George Dashwood, Bart. Mr. C. M. C. Armstrong, architect, Warwick:—

G. Wyatt & Son, Oxford	£160
A. E. Steele, Islip	146
T. Grimsley & Son,* Bicester...	138

* Accepted.

London, N.—For the erection of stabling at West Green, Tottenham. Mr. Herbert Riches, architect, 3, Crooked Lane, King William Street, London, E.C.:—

Green & Smith	£430
W Irwin	422
Sheffield Bros.	395
Rowley Bros.*	356

* Accepted.

London, S.E.—For the erection of stabling at Bermondsey. Mr Herbert Riches, architect, 3, Crooked Lane, King William Street, E.C.:—

Clemens Bros.	£1,750	10	0
F. & T. Thorne	1,627	0	0
W. Downs	1,588	0	0
Josolyne & Young	1,544	0	0
Courtney & Fairbairn,*	1,525	0	0

* Accepted.

London, S.E.—For the erection of a mission church and hall on the site of 109, 111, 113, and 115, Albert Road, for the vicar of St. Mary Magdalene, Peckham. Mr. G. A. Lansdown, architect, 9, Regent Street, S.W.:—

F. E. Gorham	£4,091
Lascelles & Co.	3,875
J. Marsland & Sons	3,713
Johnson & Co.	3,673
Higgs & Hill	3,642
H. & E. Lea	3,599
Kirk & Kirk	3,589
G. Parker	3,549
J. Burgess & Sons	3,548
R. & E. Evans	3,479
T. G Sharpington	3,468
F. & H. F. Higgs	3,434
C. Ansell	3,333
W. Nash	3,287
H. L. Holloway*	3,180

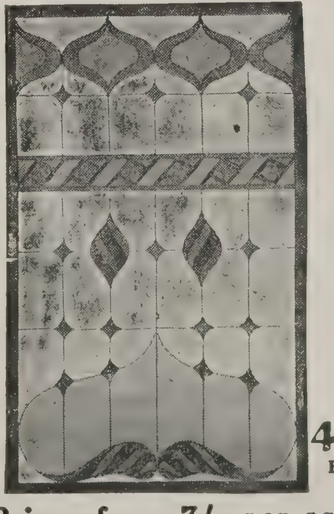
* Accepted

London, S.W.—For heating, fire mains, gas, fittings, &c., at new buildings at St. John's Road Workhouse. Mr. William Smith, A.R.I.B.A., architect 65, Chancery Lane, W.C.:—

HEATING, &c.

Dargue, Griffiths & Co., Ltd., Liverpool	£552	0	0
Johnson & Son	452	2	0
J. & F. May	445	0	0
Vaughan, Brown & Cook	423	0	0
Keith, Blackman & Co....	400	0	0
Grundy	397	0	0
Taylor & Fraser, Glasgow	395	0	0

"CLOISONNE GLASS"



WEATHER RESISTING.

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Prices from 3/- per square foot.

CATALOGUE SHOWING 250 DESIGNS ON APPLICATION.

Pemberton, Arber & Co.	£380	10	0
Cannon & Sons	377	13	0
Berry & Sons	377	0	0
Hulett & Co., Ltd.	361	15	0
Barker & Co., Ltd.	353	15	0
Cannon & Hefford	349	0	0
Harding	330	10	0
Fryer & Co,	321	0	0
BrighthouseFoundry&EngineeringCo	304	0	0
Busby & Co.	295	0	0
Watford Engineering Co., Watford	260	0	0
Stubbs, Son & Hall	258	10	0
Mellowes & Co.,* 28, Victoria Street, Westminster	217	0	0

FIRE MAINS, &c.

Arthur Inns	353	0	0
Cannon & Son	341	15	0
Barker & Co.	315	10	0
Vaughan, Brown & Cook	309	0	0
Johnson & Son	298	2	0
Merryweather	295	0	0
Keith, Blackman & Co.	290	0	0
Dargue, Griffiths & Co., Liverpool	289	0	0
Moorwood, Sons & Co., Ltd.	286	0	0
Pemberton, Arber & Co.	279	15	0
Fryer & Co.	269	16	0
J. & F. May	260	0	0
Mellowes & Co.	253	0	0
Shand, Mason & Co.	252	2	0
Watford Engineering Co., Watford	246	0	0
Stubbs, Son & Hall	245	0	0
Berry & Son	234	0	0
Cannon & Helford	229	0	0
Harding	226	0	0
Bird & Co.,* 11 Great Castle Street, Regent Street, W.	224	0	0

GAS FITTINGS, &c.

Inns	£178	0	0
Berry & Sons	167	0	0
Keith, Blackman & Co.	145	0	0
Moorwood, Sons & Co., Ltd.	133	0	0
J. & F. May	125	0	0
Cannon & Sons, Ltd.	114	15	0
Pemberton, Arber & Co.	113	10	0
Vaughan, Brown & Cook	113	0	0
Pontifex & Co.	112	10	0
Fernhead, A.	111	10	0
Johnson & Son	107	12	0
Mellowes & Co.	107	0	0
Barker & Co.	105	5	0
R. Weekes	100	6	2
Fryer & Co.	98	0	0
Hulett & Co., Ltd.	93	0	0
Cannon & Hefford	89	10	0
Watford Engineering Co., Watford	87	10	0
Harding	82	0	0
Stubbs, Son & Hall,* 26, Herbert Road, Wimbledon	75	0	0

* Accepted.

(Of London where not otherwise stated.)

Rugby.—For the erection of a new billiard-room at Rainsbrook Manor, for Dr. H. Nelson Harness. Mr. Albert E. Kingwell, architect and surveyor, 103 & 104, Cheapside, E.C., and Beech Hill Park Estate, Hadley Wood:—

Bloxham & Co., Banbury	£1,457	0	0
Gray, Hill & Co., Coventry	1,455	0	0
Foster & Dicksee, Rugby	1,420	10	0
Parnell & Son, Rugby	1,373	0	0
Poole & Son, Richmond	1,273	0	0
Kingerlee & Son, Oxford	1,179	0	0

Stevenston (Scotland).—For the construction of a covered clear-water tank, two additional filter-beds, inspection house, &c., at Greenhead filtering station, for the Irvine and District Wate Board. Mr. James Clarkson, engineer, Burgh Chambers, Irvine:—

W. Allan, Strathhaven	£6,091	16	5
H. Pullen, Kilmarnock	5,988	6	7
Murray & Milne, Glasgow	5,871	9	5
Boyd & Forrest, Kilmarnock	5,836	6	7
MacLachlan & Son,* East Road, Irvine	5,688	1	5

Note.—34 tenders received; highest, £9,447.
* Accepted.

Weymouth.—For the construction of a reinforced concrete (Hennebique) retaining wall, about 510ft. in length, on the north side of the pile pier, and other works, for the Town Council. Mr. W. Barlow Morgan, borough engineer:—

A. M. Coles, Plymouth	£8,340	0	0
R. H. B. Neal, Ltd., Plymouth	4,989	11	3
F. Bevis, Portsmouth	£4,890	0	0
F Grace, Southampton	4,875	0	0
Yorkshire Hennebique Co., Leeds	4,499	8	4
H. Page & Co., Cardiff	4,477	0	0
S. Robertson, Bristol	4,197	12	3
Playfair & Toole,* Southampton	3,786	0	0

Borough engineer's covering tender, £4,600.
*Accepted.

Watford.—Accepted for the erection of four villas in Whippendell Road, for Mr. L. T. Simmons:

H. Brown, Watford	£1,650

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—adjudication.]

DURING THE WEEK ending October 19th twenty-one failures in the building and timber trades in England and Wales were gazetted.

W. WADE, builder, Crewe. Adj , Oct. 12.

M. EDWARDS, builder, Fleurdelis. R.O., Oct. 12.

E. ANTILL & SONS, builders, Bermondsey. Adj., Oct. 9.

W. BARNARD, timber merchant, Godstone. R.O., Oct. 9.

F. WHITEHOUSE, builder and contractor, Ipswich. R.O., Oct. 9.

H. BURGESS, builder and house decorator, Ealing. R.O., Oct. 8.

J. HARLOW, builder and contractor, Burton-on-Trent. R O., Oct. 12.

J. HUGHES, builder and contractor, Conway. R.O., Oct. 11.

W. TAYLOR & Co., builders and contractors, Tamworth. R.O., Oct. 9.

G. GOWLING, plumber. Manchester. First meeting O R.'s, Manchester, Oct. 24, at 2.30. P.E., Manchester C.C., Oct. 26, at 10. R.O., Oct. 10.

L. S. OWEN, builder and contractor, Swansea. First meeting, O.R.'s, Swansea, Oct. 25, at 11.30. P.E., Town Hall, Swansea, Nov. 9, at 11 30. R.O., Oct. 9.

T. LIVERSEDGE, master painter and paperhanger, Middlesbrough. P.E., Middlesbrough C.C., Oct. 26, at 10.30. First meeting O.R.'s, Middlesbrough, same day, at 12.30.

C. FLEET & SON, house decorators, writers, and grainers, Margate. First meeting O.R.'s, Canterbury, Oct. 25, at 9.30. P.E., Guildhall, Canterbury, same day, at 10. Adj., ct. 10.

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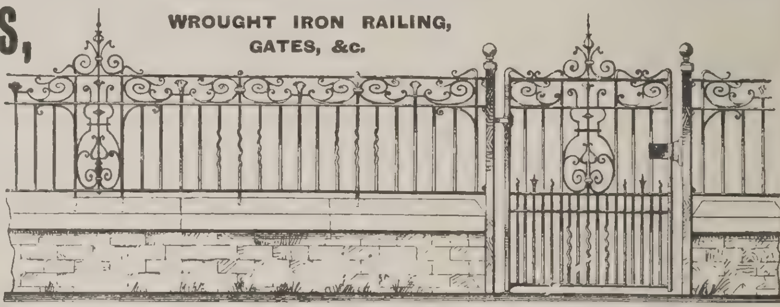

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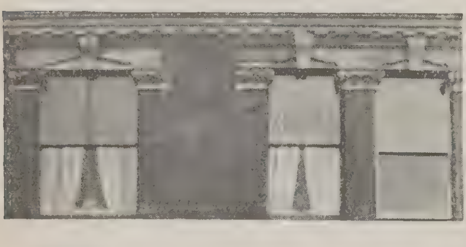

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THE BUILDERS' JOURNAL
AND ARCHITECTURAL ENGINEER.

October 24, 1906.

FIRE SUPPLEMENT (MONTHLY).

FIRE-RESISTING GLAZING.

We have, from time to time, referred to the great importance of fire-resisting glazing, and the glazing that has been under review in respect to its fire-resistance has been mainly either of the wire-glass type or of the electro-glazing type.

Nearly every time that we have mentioned any test with this form of glazing it has been shown that there has been an improvement both in the glazing and in the manner in which the glazing is inserted in the casements, as also in the casements themselves.

In the current issue we publish a test of a most remarkable kind that has been recently undertaken with Mississippi wire-glass—i.e., glass by the Mississippi Wire-glass Company, of New York, U.S.A., who make a speciality of this form of glazing for the Western Hemisphere.

This test, as the preamble signed by Mr. Ellis Marsland and Mr. James Sheppard indicates, has again demonstrated the important fact that window openings can be protected by wired glass so as to prevent the passage of flame that may continue to burn against one side for 90 minutes.

The achievement of 90 minutes is, indeed, a record. We believe the first tests with wire glass only aspired to afford resistance for half an hour. Following this there was a record of 45 minutes, then one of one hour, and now we actually find that this wired glazing, both opaque and transparent, will withstand a fierce fire of a temperature of over 1,500 deg. Fahr. for a period of a full hour and a half, and also withstand the application of water applied for two minutes from a steam fire engine.

The test in question has been conducted by the British Fire Prevention Committee under its usual conditions, and all who have witnessed these tests realise what a fire of this temperature means. It is true that in the test particularly under review—namely, that of 90 minutes—one out of three openings filled with wire glass failed, but the failure to our mind was in that case not attributable to the glazing, but to the unsatisfactory fixing in what we would consider a somewhat unsuitable frame.

The glazing fixed in a well-made hollow frame let neither fire nor water pass through the glazing. The solder to the metal sashes and frame was melted and the name plate on the casement dropped off, but the glazing remained sound and only showed the usual innumerable hair cracks. The same can be said of the wire glazing that was put into a brick reveal, and it is only in the opening where there was an unsatisfactory casement that we find it recorded that the glazing drew away from the rebate at the top and partly melted along the top edge, which meant bulging, cracking and letting the fire pass through.

It would be, perhaps, a point to remark that, as a matter of fact, the glass which withstood the 90 minutes' test was subject to more than usually severe strain, for owing to the bulging of the one casement the temperature in the passage away from the fire, which was to be protected by the ¼-in. glazing, rose to 1,200 deg. Fahr., and the glazing that remained intact had thus an actual fire on the one side and a high temperature on the other.

With the growing demand for larger buildings and the requirements of greater cubic contents, it is obvious that the question of glazing will play an all-important rôle in the development of our large cities, and it will be glazing and shutters combined that will probably in the future prevent the spread of fire from house to house, and more particularly across small areas and courts.

The makers of the glazing in question should thus be congratulated upon their manufactures, and we have not the slightest doubt that the examples shown by our American cousins will be very quickly followed, if not surpassed, by the well-known makers of wire-glass in this country. A stimulant from the United States of this description can only be described as healthy, and we still anticipate seeing strides made in the perfection of wire-glass at home.

There is one point, however, to which we would like to call attention—namely, that obviously there must be great radiation of heat through the slight ¼-in. thickness of a piece of wire-glass, and the textiles actually against the glass would probably catch fire. It will then be well to keep in mind the suggestion made by Messrs. Ellis Marsland and James Sheppard, that in certain cases double glass, or double casements or frames, should be applied, particularly in positions liable to be exposed to fierce flame and great heat. This suggestion should have particular application to small areas in our warehouse districts and in respect to the glazing in lift shafts.

Details of the Test.

Above we deal with the general aspect of the wire-glass tests recently conducted by the British Fire Prevention Committee, and we here would only present in short the "Object of Test" and "Summary of Test" of the two investigations conducted by that body.

The first test was one 45 minutes' duration, the second one 90 minutes' duration; and in each case the glazing in three window openings was under review. The second test being the more interesting, we present in that case not only the "Object" and "Summary" of the test, but particulars of the casements and frames used, which, of course, played an important rôle.

Object of First Test.

To record the effect of a fire of 45 minutes' duration, the temperature to reach 1,500 deg. Fahr. (815.5 deg.), but not to exceed 1,650 deg. Fahr. (898.8 deg.), followed by the application of water for two minutes, with the view of being classified as affording temporary protection (Class A).

Note.—The openings were numbered, Nos. 1, 2 and 3.

Opening No. 1 was filled in with a teak frame, divided into two squares, into which the glass was fixed with teak beads.

Opening No. 2 was filled in with a steel frame with two steel casements, into each of which a square of glass was fixed.

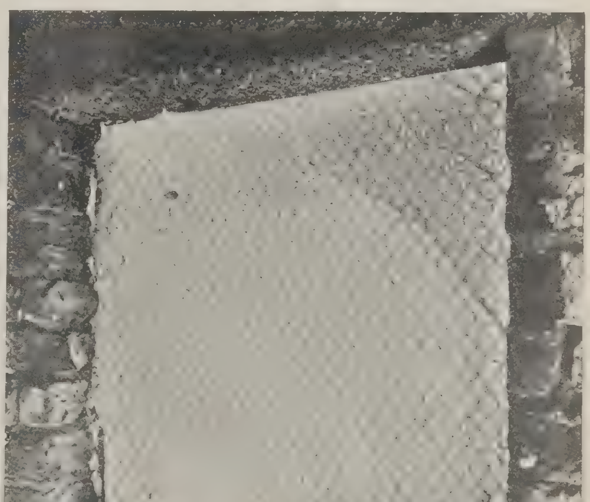
Opening No. 3 was filled in with a metal-cased frame and two sliding sashes; each sash was divided into two squares, into which the glass was fixed.

Summary of First Test.

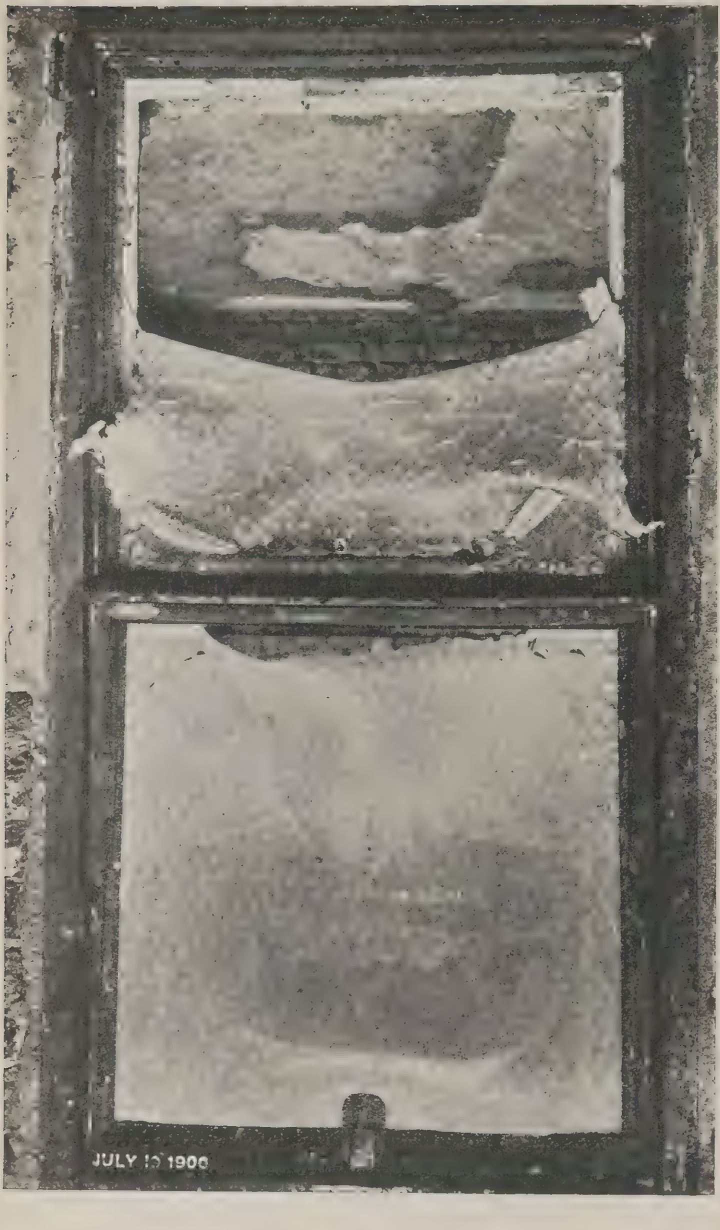
Immediately on lighting the gas the glass in each opening commenced to crack in various directions, and continued to do so during the test.

Opening No. 1.—Fire did not pass through the glass. Smoke passed between the glass and frame. The upper part of the frame was charred on the outside during the test, and at its conclusion burst into flame. The glass remained in position after the application of water, but subsequently the lower square fell outwards on being tapped.

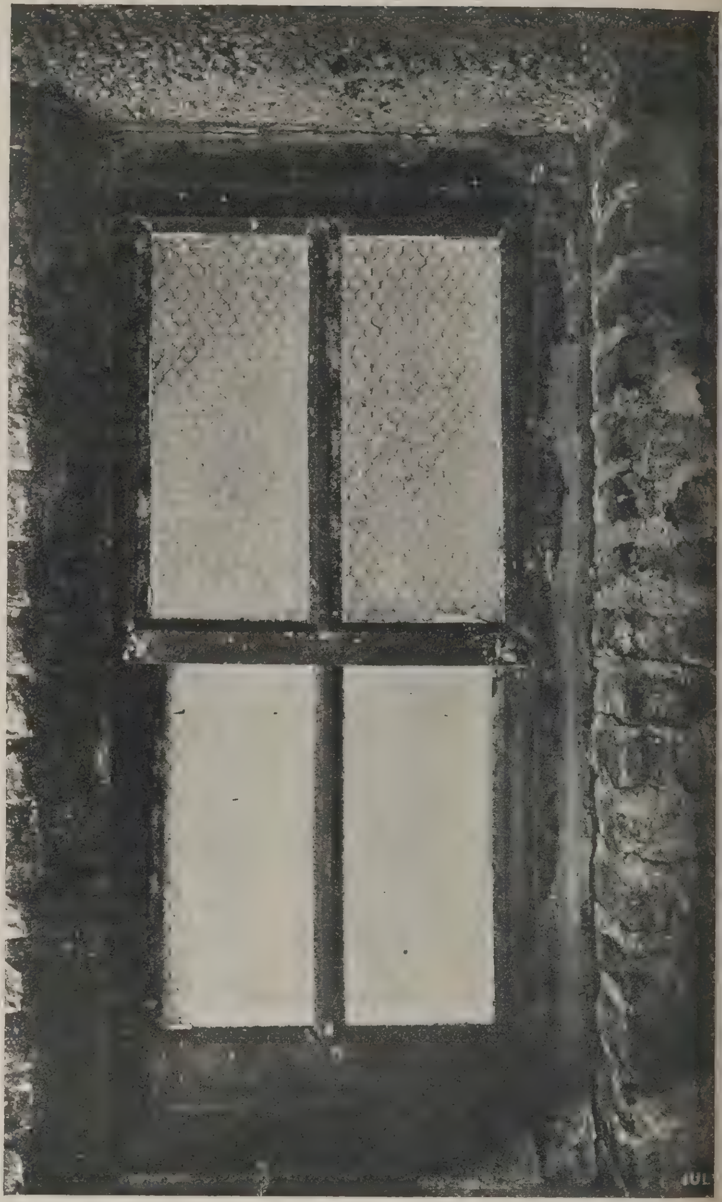
Note.—During the night the upper square of glass fell. Both squares remained unbroken, and were replaced as shown in Fig. 9.



OPENING NO. 1. IN THE SECOND TEST: FROM THE FIRE SIDE AFTER 90 MINUTES TEST.



OPENING NO. 2 IN THE SECOND TEST: AFTER 90 MINUTES, FROM THE FIRE SIDE.



OPENING NO. 3 IN THE SECOND TEST: AFTER 90 MINUTES, FROM THE FIRE SIDE.

Opening No. 2.—Fire did not pass through the glass. The steel angle frame and casement were uninjured, with the exception of being slightly twisted. The glass remained in position. Smoke passed between the frame and the brickwork and between the meeting bars of the casement. Smoke was given off on the outside from the putty.

Opening No. 3.—Fire did not pass through the glass. The sheet steel hollow frame and sashes were intact, and the glass was in position. Smoke passed between the frame and brickwork, and smoke was given off by the putty. Solder used at angle joints and for fixing metal name plate on the outside was melted.

Classification was obtained as affording "temporary protection (Class A)."

Object of Second Test.

To record the effect of a fire of 90 minutes' duration. The temperature to reach 1,500 deg. Fahr. (815.5 deg. C), but not to exceed 1,650 deg. Fahr. (898.8 deg. C), followed by the application of water for two minutes, with the view of being classified as affording partial protection (Class A).

Note.—The openings were numbered, Nos. 1, 2 and 3.

Opening No. 1 was filled in with one square of glass, fixed directly into a brick reveal.

Opening No. 2 was filled in with a steel frame with two steel casements, into each of which a square of glass was fixed.

Opening No. 3 was filled in with a metal-cased frame and two sliding sashes; each sash was divided into two squares, into which the glass was fixed.

Summary of Second Test.

Immediately on lighting the gas the glass in each opening commenced to crack in various directions, and continued to do so for some time during the test.

The glass in the openings remained in position during the test.

On the application of water the glass became sintered all over.

Opening No. 1.—Neither fire nor water passed through the glass.

There was a bulge inwards of about ½in. (.012 metre).

Opening No. 2.—On the expiration of 60 minutes the glass in the opening was intact, save for the cracks mentioned.

In 65 minutes the glass in upper casement began to bulge.

In 70 minutes the glass in lower casement began to bulge.

In 84 minutes the glass in upper casement had drawn sufficiently out of rebate to let flame through.

In 87 minutes the glass in lower casement had drawn sufficiently out of the upper rebate to let flame through.

The glass in upper casement dropped away from rebate and curved inwards for about half its depth.

On the application of water the glass remained in the casement, although damaged and bulged.

The steel casement was slightly buckled in places.

Opening No. 3.—Neither fire nor water had passed through the glass.

The solder to the metal sashes and frame was melted, and the name plate dropped off.

Classification, partial protection (Class A) was obtained in openings No. 1 and 3.

Description of the Frames and Glazing used in the Second Test

Opening No. 1.—Sight size, 2ft. 3in. by 2ft. 3in. (.68 by .68).

The glass in opening No. 1 was "Maze" wired-glass ¼in. (.006 metre) thick, and was glazed directly into the brick reveal by being bedded in a com position of asbestos and plaster.

The size of the square was 2ft. 6in. b 2ft. 6in. (.7619 metre by .7619 metre), and its area 900 sq. in. (.58 sq. metre).

Opening No. 2.—Sight size, 2ft. 3in. by 4ft. 6in. (.68 metre by 1.37 metres).

The glass in opening No. 2 in two squares; the upper square was of rolled plate-wired glass ¼in. (.006 metre) thick, and that in the lower square was polished plate-wired glass ¼in. (.006 metre) thick. Each square was glazed with putty into a steel angle casement and secured by a steel angle fillet screwed to the casement. The casements were fitted to a steel angle frame, one being hung on centres and the other being fixed.

The size of each square of glass was 2ft. 0¾in. by 2ft. 0¾in. (.6285 metre by .6285 metre), and its area was 612 sq. ins. (.42 sq. metre).

Opening No. 3.—Sight size, 2ft. 3in. by 4ft. 6in. (.68 by 1.37 metres).

The glass in opening No. 3 was glazed with putty into two sliding hollow metal sashes, each divided into two squares, and secured by a metal fillet on centre bar. The glass in the two upper squares was "Maze" wired-glass ¼in. (.006 metre) thick, and the glass in the two lower squares was polished plate-wire glass ¼in. (.006 metre) thick. The sashes were fixed in a hollow cased frame of galvanised sheet steel.

The size of each square of glass was 22in. by 9in. (.5587 metre by .2286 metre), and its area was 198 sq. ins. (.12 sq. metre).

SKYLIGHTS.*

American Rules.

In considering the question of skylights it has been thought advisable to include not only skylights, their construction, protection and arrangement, as well as the types of buildings or roofs on which they are used, which necessarily constitute a factor to be taken into consideration, but to enlarge the scope so as to include all roof openings. While the object of this committee is primarily to provide proper safeguards against fires from exposures, liable to endanger a risk through roof openings, the guarding against the spread of fire arising within the building, through improperly constructed skylights, has been kept in view in so far as the type of building, or its construction would warrant.

While it is important to establish a standard in these, as in all other matters relating to protection against losses from fires, there are numerous existing conditions relating to the construction of buildings and materials employed, and the purposes for which they are used, which must be recognised, and it has been the object to keep all of these conditions fully in mind.

For this reason several broad classifications in construction have been considered, viz.: Type of building—fire resistive, slow-burning, ordinary brick or frame; kind of roofs—fire resistive, slow burning, ordinary light construction with approved covering, as well as shingles; purposes for which buildings are used; and, to a minor extent, location, height and exposures.

In drawing up this report various local requirements have been considered and the suggestions of the National Board of Fire Underwriters' Building Code have been kept in view in order to maintain uniformity.

The following kinds of roof openings have been taken under consideration: Skylights—flat, plane or inclined, peaked, cupolas, domes, monitors or lanterns, vertical or pitched saw-toothed roofs, raised sections of roofs with sash, and dormer windows; also suitable arrangement for protection of sash in side or top openings or raised skylights; ventilators, door landings, pent houses or bulkheads; scuttles; and lights over bottoms of light shafts or wellholes open at top.

For buildings of standard fire-restive or slow-burning (mill) construction (except over stair, elevator or dumbwaiter shafts and theatre stage roofs, which see), approved wired glass, not less than ¼ inch thick, properly secured in metal sash, set in metal frames, or glass not less than ½ inch thick, similarly secured, provided it is protected by suitable wire screens, should be used on all plane skylights and skylights inclined at an angle of not over 45 degrees. In vertical skylights or sash, or such as are inclined at an angle of over 45 degrees, glass not less than ¼ inch thick may be used secured as noted above, provided the skylights or sash are protected by suitable screens; if, however, such skylights be exposed in such a manner that wall openings in buildings would require standard fire shutters or standard wire glass sash (or doors) against such exposure, wired glass only to be used.

The above described kinds of skylights are recommended on all other classes of buildings.

All skylights other than those indicated above, ventilators or ventilating openings on roofs. should be protected by screens of steel wire cloth woven (not twisted), galvanised after weaving, properly secured to strong iron frames, preferably galvanised if used for protection of skylights, or otherwise properly secured to ventilators.

Door landings, pent houses or bulkheads on roofs should be constructed of approved fire resistive materials throughout in proper manner if on buildings of fire-resistive construction, or properly fireproofed if on other buildings.

Scuttle covers should be similarly treated.

Lights over bottoms of light shafts or wellholes open on top should be of ½-inch approved wired glass or ¾-inch thick glass, properly protected by wire screens, securely set in strong metal frames, or of prism lights set in cast iron frames of sufficient strength and properly secured. The tops of such shafts should be protected by approved wire screens as noted above.

General Plan Governing the Arrangement of Rules.

Class A. Skylights. Types.

CONSTRUCTION.

1. Glass.—(*a*) Plane skylights, or such as are inclined not over 45 degrees. (*b*) Vertical skylights or sash, or such as are inclined at an angle of over 45 degrees. (*c*) For vertical skylights or sash, or sash inclined at an angle of over 45 degrees. when exposed. (*d*) For skylights over fireproof stair, elevator dumbwaiter, air or similar shafts. (*e*) For skylights over stage sections of theatres.

2. Sash. (*a*) Materials. (*b*) Construction. (*c*) Glazing,

3. Frames.

4. Curbs. (*a*) On buildings of fire-resistive construction. (*b*) On buildings of slow burning construction. (*c*) On other types of buildings. (*d*) Manner of fastening

5. Monitor or lantern skylights. (*a*) Construction. (*b*) Sash. (*c*) Frames.

(6) Sawtoothed skylights. (*a*) Construction. (*b*) Sash.

7. Vertical sash under raised sections of roofs.

8. Ventilating skylights or skylight sash. (*a*) Hinged sash. (*b*) Pivoted sash (*c*) Protection.

9. Windows in roof structure.

0. Dormer windows. (*a*) Construction. (*b*) Sash and frames.

11. Skylights on stair. elevator. dumbwaiter, light, air, and similar shafts. (*a*) Construction. (*b*) Glazing (*c*) Ventilation.

12. Theatre stage skylights. (*a*) Construction. (*b*) Glazing. (*c*) Operating. (*d*) Types—1, counterbalanced; 2, rolling. (*e*) Protection.

PROTECTION.

13. Wire cloth. (*a*) Kinds. (*b*) Sizes to be used for different types of skylights and under different conditions, items 1, 2, 3, 4, 5, 6, and 7.

14. Securing wre cloth.

15. Frames. (*a*) Materials for varying size of screens, 1, 2, 3, 4, and 5. (*b*) Re-inforcing. (*c*) Supports. (*d*) Braces. (*e*) Construction—1, rods; 2, pipes; 3, angles. (*f*) Securing frames.

16. Distance of screens from skylights. (*a*) Top lights (*b*) Side lights.

17. Raised skylights.

18. Vertical or sawtoothed skylights, &c.

19. Removable screens.

Class B. Ventilators. Types.

20. Materials.

21. Construction and protection. (*a*) Flue ventilators, 1, 2, 3, manner of protection. (*b*) Lower ventilators, &c. c) Ventilating monitors, &c. (*d*) Frame ventilators, &c.

Class C. Doorlandings, Pent Houses or Bulkheads,

22. (*a*) On buildings of fire-resistive construction. (*b*) On buildings of slow-burning construction. (*c*) On other types of buildings.

Class D. Scuttles.

23. Construction. (*a*) On buildings of fire-resistive construction. (*b*) On buildings of slow-burning construction. (*c*) On other types of buildings.

24. Fastening.

25. Stops.

26. Ladders.

Class E. Open Air or Light Shafts.

27. Lights.

21. Protection of shafts.

CLASS A. SKYLIGHTS.

Roof Openings.

Types: By the term skylights as employed in this report is meant any opening through roof of building for the admission of light.

The following types with their modifications and combinations, which are included, are noted: Flat skylights, plane or inclined; peaked skylights; cupola skylights; monitor and lanterns; saw-toothed roofs; raised sections of roofs with vertical sash: ventilating skylights; dormers. &c.; also special skylights, as over stair, elevator or dumbwaiter shafts, and over stage portions of theatres.

Construction.

1. Glass.—(*a*) For all skylights, plane or inclined not over 45 degrees. to be either of standard wired glass not less than ¼-in. thick or ½-in. thick glass protected with approved wire screens. Panes to be not over 18ins. or 20-ins. wide, and not to exceed 720 sq. ins. in area.

(*b*) For vertical skylights or sash, or such as are inclined at an angle of over 45 degrees, may be wired glass as noted under (*a*), ½-in. thick glass without screens, or glass not less than ¼-in. thick, provided the sash or skylights are protected by suitable screens.

(*c*) For vertical skylights or sash, or such as are inclined at an angle of over 45 degrees, when exposed in such a manner that the wall openings in buildings would require standard fire shutters or standard wired glass (or doors) against such exposures, standard wired glass only should be used.

(*d*) For skylights over fireproof stair, elevator, dumbwaiter, air or similar shafts not over ⅛-in. glass, either on top or at sides of cupola skylight, if surmounted by that type, protected by suitable screens.

(*e*) For skylights over stage sections of theatres not over ⅛-in. glass, protected by suitable screens.

NOTE.—Substitutes for glass, such as "Translucent Fabric" or similar materials, are not approved, and shall be considered as ⅛-in. thick glass; not permitted, however, where ⅛-in. thick glass is specified.

2. Sash.—(*a*) Materials. Sash to be constructed entirely of metal, either galvanised iron, wrought iron, or angle iron.

(*b*) Construction. To be constructed in accordance with the rules and requirements of the National Board of Fire Underwriters for wired glass windows.

(*c*) Glazing. Glass to be secured to the sash by means of metal strips held in position by bolts or screws in such a manner as to form joints sufficiently elastic to allow for proper expansion and contraction and to be weather proof.

3. Frames.—Frames for low, flat or small cupola skylights to be entirely of galvanised iron secured to angle irons, all properly riveted together and securely fastened to roof. All joints to be tight and weather proof.

4. Curbs for Skylights.—(*a*) If on buildings of fire-resistive construction to be constructed of approved fire-resistive materials reinforced with angle iron properly protected by approved fire-resistive material.

(*b*) If on buildings of slow-burning construction may be either (1) of not less than 4×4-in. framework, filled in with brick, terra cotta, cement, or other approved fire-resistive materials, tin-clad on the outside; (2) double boarded, tongued and grooved, boards at right angles to each other, tin-clad on the outside; (3) of not less than 2¾-in. tongued and grooved, or splined plank, tin-clad on the outside.

(*c*) On all other buildings, if not in accordance with the foregoing, and of frame, to be thoroughly tin-clad on the outside.

(*d*) Curbs must be securely fastened to framework of roof, and when on roofs of joisted construction should be supported on double joists.

5. Monitor or Lantern Skylights.—(*a*) Construction. To conform in general with roof construction of buildings of which they form a part, and as specifically noted under Curbs, section 4, class A.

(*b*) Sash. To conform in all particulars to sections 1 and 2, class A.

(*c*) Frames. (1) If for skylights on top of monitors or lanterns to conform with section 3, class A. (2) If in sides of monitors or lanterns of fire-resistive construction to be constructed in accordance with the rules and requirements of the National Board of Fire Underwriters for wired glass windows. (3) For all monitors or lanterns where woodwork is permissible, see under (a), this section, the frames, if of wood, should be thoroughly protected by galvanised iron, including the rabbets, if any, or recessed portions, receiving the sash.

6. Sawtoothed Skylights.—(*a*) Construction. To conform in general with roof construction of buildings of which they form a part, and as specifically noted under Curbs, section 4, class A.

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* Report of a Committee appointed by the United States National Fire Protection Association.

(*b*) Sash. To conform in all particulars with sections 1 and 2, Class A.

Note.—Usually this type of skylight is one continuous frame. The muntins or rails should conform in manner of construction and securing to the requirements laid down in the rules for wired glass sash by the National Board of Fire Underwriters. Any deviations of this arrangement will be governed by the rules or requirements of the types or kinds under which they may come.

7. Vertical Sash under Raised Sections of Roofs.—This includes also a row of sash or sections of wall entirely of glass, above the wall proper and underneath the roof.

Should conform in general with the rules and requirements noted under sections 5 and 6, class A, in so far as these apply.

8. Ventilating Skylights or Skylight Sash.—Frequently portions of skylights (sometimes the entire sash) are arranged that they may be opened for purposes of ventilation; if top sash are so arranged they are generally hinged at the highest point, while side sashes are hinged either at the top, or near the centre line, turning either on a horizontal or vertical axis. Sashes hung at the top are usually secured by hinges, those hung near the central line by trunnions or pivots.

(*a*) Hinged sash. To be provided with hardware, and hung and arranged in such a manner as to conform to the rules and requirements of the National Board of Fire Underwriters for wired glass sash.

(*b*) Pivoted Sash. To be provided with hardware, and hung and arranged in such a manner as to conform to the rules and requirements of the National Board of Fire Underwriters for wired glass sash.

(*c*) Protection. All ventilating skylights or skylight sash should be protected by wire cloth screens as specified, in such a manner that the screen will allow full freedom of operation. In no case should the operation of the sash require the removal of the screen or any portion of the same. The screens should be entirely independent of this type of skylights or sash and shall be of ample size to completely protect the opening.

9. Windows in Roof Structure.—All window openings in roof structures, such as shafts extending above roofs, pent houses, high curbs, ends of sawtoothed or monitor or lantern skylights, &c., should conform to sections 1, 2 and 5, class A, in so far as these apply.

10. Dormer Windows.—(*a*) Construction. To conform in general with roof construction of buildings of which they form a part, and as specifically noted under Curbs, section 4, class A.

(*b*) Sash and Frames. To conform in all particulars to sections 1 and 2 and section 5, class A, respectively, in so far as these apply.

11. Skylights on stair, elevator, dumbwaiter, light, air and similar shafts, if of fire-resistive construction and cut off from buildings. (*a*) Construction. To be constructed with metal frames and sash in accordance with sections 3 and 2, class A.

(*b*) Glazing. Top sash of cupola skylights, if any, to be glazed with wired glass, or $\frac{1}{2}$-in. thick glass protected, see section 1, class A; sides should be glazed with glass not over $\frac{1}{8}$in. thick, plane skylights to be glazed with glass not over $\frac{1}{8}$in. thick; protected by suitable wire screens. Glazing to be done in accordance with section 2, class A.

(*c*) Ventilation. Where ridge ventilators or louvres in ends or sides of such skylights are provided, these should be protected by suitable wire cloth screens, properly secured.

12. Theatre Stage Skylights.—(*a*) Construction. Curb or frame, and sash to be constructed in accordance with the rules and requirements of sections 2, 3 and 4, class A.

(*b*) Glazing. To be glazed with glass not over $\frac{1}{8}$in. thick, in accordance with section 2, class A, each pane measuring not less than 300 sq. in.

(*c*) Operating. Sash to be in two movable sections so arranged as to open readily by the action of heat from below on a fusible link or series of links; or similar device, which upon parting will allow the sash to open automatically, and also by means of the cutting of a hempen cord, extending to the stage floor and within reach of fly gallery.

(*d*) Types. Two types of skylights for this purpose are suggested.

(1) Two counterbalanced sashes, hinged to the outer edges of the curbing or frame, which should be slightly hip shaped, the upper edges coming together when sashes are closed, and arranged in such a manner that one is provided with an overhanging lip or batten to keep out the weather. Each sash to have extension rods or bars at the lower (hinged) edge, projecting beyond the curb for a distance not less than the width of the sash, to which bars should be securely attached a weight not less than 50 per cent. heavier than the weight of the sash. Hinges to be of heavy brass, bolted to the sash and curb or frame, and set well back from the edges of the frame.

(2) Two rolling sashes, fitted with brass wheels not less than $2\frac{1}{2}$in. in diameter, set inside of outer edge of sash for a distance of not less than 2ins., well secured to sash. The wheels to run on brass tracks properly secured to the curb or frame and rails extending beyond same on either side to roof. Curb or frame to be hip shaped, the slopes to be such that the sash shall be inclined at not less than an angle of 30 degrees.

The height of the curb or frame shall be such that the lowest portion of the tracks on which the sash slide, shall not be less than 12in. above the roof.

(*e*) Protection. Either type of skylight for this purpose shall be protected by suitable steel wire cloth, properly secured in such a manner as not to interfere with the operation of the sash and sufficient size to cover the entire opening properly, as well as to protect the sliding sash when open.

Protection.

All skylights, except those glazed with wire glass, or glass $\frac{1}{2}$in. thick or over, when inclined at an angle of 45 degrees or vertical (unless exposed as noted under section 1, rule c, class A) should be protected by wire screens of galvanised steel wire cloth.

13. Wire Cloth.—(*a*) Kind. All wire cloth shall be woven (not twisted) of steel wire, galvanised after weaving.

(*b*) Sizes. (1) For plane skylights, or skylights inclined at an angle of 45 degrees or less, glazed with $\frac{1}{2}$-in. thick glass, cloth of not lighter than No. 12 wire and not over $\frac{3}{4}$-in. mesh shall be used.

(2) For plane skylights, or skylights inclined at an angle of 45 degrees or less, glazed with glass not less than $\frac{1}{4}$in. thick, but less than $\frac{1}{2}$in. thick, cloth of not lighter than No. 12 wire and not over $\frac{3}{4}$in. mesh shall be used.

(3) For plane skylights, or skylights inclined at an angle of 45 degrees or less, glazed with glass less than $\frac{1}{4}$in. thick, cloth of not lighter than No. 12 wire and not over $\frac{3}{4}$in. mesh shall be used.

(4) For vertical skylights or sash, or such as are inclined at an angle of over 45 degrees (except when glazed with glass not less than $\frac{1}{2}$in. thick), glazed with glass not less than $\frac{1}{4}$in. thick, unless exposed, cloth of not lighter than No. 12 wire and not over $\frac{3}{4}$in. mesh shall be used.

(5) For vertical skylights or sash, or such as are inclined at an angle of over 45 degrees (except when glazed with glass not less than $\frac{1}{2}$in. thick) glazed with glass less than $\frac{1}{4}$in. thick, unless exposed, cloth of not lighter than No. 16 wire and mesh not over No. 3 ($\frac{1}{3}$in.) shall be used.

(6) For vertical skylights, or such as are inclined at an angle of over 45 degrees, if exposed as per section 1, rule c, class A, unless glazed with wired glass, cloth of not lighter than No. 12 wire and not over $\frac{3}{4}$-in. mesh shall be used.

14. Securing Wire Cloth.—All wire cloth shall be securely fastened to frames by means of galvanised iron wire or by means of special metal strips and rivets, bolts or screws.

15. Frames.—(*a*) Frames for wire cloth screens shall be constructed of iron rods, pipes or angles as follows: (1) For screens not over 3ft. in any direction, $\frac{3}{8}$-in. rods, $\frac{1}{4}$-in, pipe or $\frac{1}{2}$-in. angles. (2) For screens over 3ft. and under 4ft. in any direction, $\frac{1}{2}$-in. rods, $\frac{3}{8}$-in. pipes or $\frac{3}{4}$-in. angles. (3) For screens over 4ft. and under 6ft. in any direction, $\frac{5}{8}$-in. rods, $\frac{3}{4}$-in. pipes, or 1-in. angles. (4) For screens over 6ft. and under 10ft. in any direction, 1-in. rods, $1\frac{1}{4}$-in. pipes, or $1\frac{1}{2}$-in. angles. (5) For screens of larger sizes, proportionately larger sized materials are to be used, in which case angles are to be preferred.

(*b*) Reinforcing. Where dimensions exceed 3ft. in any direction, cross bars, placed not over 3ft. apart, or over 3ft. distant from outer bars, shall be provided for reinforcing the frames. These reinforcing bars shall conform in size to the rods, pipes or angles under (*a*), this section, increasing in size as noted according to span.

(*c*) Supports. Upright supports, to correspond with materials specified under (*a*), this section, and at end of each re-enforcing member, and to be not less in size than the bars supported.

(*d*) Braces. All enclosing frames over 3ft. high and more than 6ft. in length shall have braces extending from the upper angles to the base line, one in each corner of each side.

(*e*) Construction. The frames should be strongly assembled.

(1) If constructed of rods these should be welded together, or threaded and securely joined by threaded malleable iron fittings, and uprights shall be properly shaped at lower ends to permit fastening by means of screws; or if size permits, to be threaded and provided with threaded malleable iron base or foot plates, drilled for three bolts or screws each.

(2) If constructed of pipes, these should be threaded and secured by means of threaded malleable iron fittings, and uprights shall be threaded and provided with threaded malleable iron base or foot plates, drilled for three bolts or screws each.

(3) If constructed of angle irons these should be welded together or fastened at the corners by fillet angles securely riveted in place. Uprights to be shaped at base to permit fastening by at least four screws or bolts each.

(*f*) Securing frames. All frames for screens to be secured to roofs or frames of permanent skylights, monitors, lanterns, &c., by means of lag screws or bolts.

16. Distance of Screens from Skylights, &c., to be Protected.—(*a*) All screens shall be placed 6ins. or over above skylights to be protected, and shall project the same distance beyond edges of the skylight it is raised above.

(*b*) All screens used for protecting side lights shall be placed not less than 6ins. from lights or openings so protected.

17. Raised Skylights.—Screens for raised skylights having top and side sash contiguous shall have the frames on top secured to those on the sides as noted under (*e*), section 15, and wire cloth shall cover the entire framework and come within 6ins. of roof.

18. Vertical or Sawtoothed Skylights or Sash, or Those Inclined at an Angle of over 45 Degrees.—Screens for vertical or sawtoothed skylight or sash, or those inclined at an angle of over 45 degrees, shall be returned at the top and sides in such a manner as to exclude embers or sparks from span between the screens and glass.

19. Removable Screens.—Where for any purpose it becomes necessary that screens or portions of screens used in protecting side lights must be removable these screens or portions of screens shall be framed as specified under section 15, and similarly constructed frames placed around such openings. Such screens or sections of screens shall be secured to the permanent frame by means of riveted wrought-iron hinges and be provided with strong wrought-iron latches, bolts, or hooks.

CLASS B. VENTILATORS.

Types: By ventilators as considered in this report are meant all structures designed for the emission of air, gases or vapours from the building, separateor rooms compartments, and include louvre openings as well as ridge ventilators or tops of skylights.

20. Materials.—(*a*) To be constructed entirely of galvanised iron at least No. 24 gauge, copper at least No. 20 gauge, or of other approved fire-resistive materials.

21. Construction and Protection of Ventilators.—(*a*) If flues, either extending through roofs or sides of buildings, these should be provided either (1) with cowls or hoods projecting the same distance beyond outer edge of flue that they are raised above same, but in no instance less than 3ins. and opening should be protected with a screen of steel wire cloth, of not less than No. 16 wire or more than No. 3 ($\frac{1}{3}$in.) mesh, properly secured and completely covering the opening; or (2) edges of cowls may be carried beyond and underneath projecting or flanged edges of the flues in such a manner as to provide two turns in passage of opening; or (3) flue may be bent in such a manner as to form an inverted U.

(*b*) Louvre ventilators, or ridge ventilators, or Louvres in raised or hip skylights, shall be constructed entirely of galvanised iron of at least No. 24 gauge, as specified under section 3, class A. Slats of louvres to be of galvanised iron as specified, properly reinforced, and riveted to the frames. All such ventilating openings shall be protected with a screen of steel wire cloth, of not less than No. 16 wire or more than No. 3 ($\frac{1}{3}$in.) mesh, properly secured to the frames and completely covering the openings.

(*c*) Ventilating monitors, or similar structures, to conform in general with roof construction of buildings of which they form a part, and as specifically noted under section 4, class A. Louvre or ventilating slats to be of galvanised iron, as specified, properly reinforced and riveted to frames. All such ventilating openings to be protected by steel wire cloth,. of not less than No. 16 wire nor more than No. 3 ($\frac{1}{3}$in.) mesh, properly secured and completely covering the openings.

(*d*) Frame ventilating structures, similar to those referred to under a, b and c, section 21, class B, but constructed of other materials, shall be protected by steel wire cloth of not less than No. 16 wire or more than No. 3 ($\frac{1}{3}$in.) mesh, properly secured and completely covering the opening.

CLASS C. DOOR LANDINGS, PENT HOUSES OR BULKHEADS.

22 (*a*) On all openings of fire-resistive construction to be constructed of approved fire-resistive materials, reinforced with angle iron, properly protected by approved fire-resistive materials. Doors to be standard. Windows to be of standard wired glass, in standard metal frames.

(*b*) On buildings of slow-burning construction may be either (1) of not less than 4×4-in. framework, filled in with brick, terra cotta, cement, or other approved fire-resistive materials, tin-clad on the outside; (2) double boarded, tongued and grooved, boards at right angles to each other, tin-clad on the outside; (3) of not less than $3\frac{3}{4}$-in. tohgued and grooved, or splined plank, tin-clad on the outside. Doors to be double battened, tin-clad on the outside, with tinning returned over the edges, Windows to be of standard wired glass in standard metal frames or as noted under b and c, section 1; items 5 and 6, b, section 13; and section 18, class A.

(*c*) On all other buildings, if not in accordance with the foregoing, and of frame, to be thoroughly tin-clad on the outside. Doors to be tin-clad on the outside and windows protected as noted under b and c., section 1; items 5 and 6, b, section 13; and section 18, class A.

CLASS D. SCUTTLES.

23. Construction.—(*a*) If on buildings of fire resistive construction to be of (1) No. 12 gauge sheet iron or steel, reinforced by 2×2×$\frac{1}{4}$-in. angle iron, or (2) double battened wood, standard tin-clad on all sides, edges and in all angles, and be provided with proper chafing plates where fitting over combing.

(*b*) If on buildings of slow-burning construction to be as noted under (a), this section, or of double battened wood, tin-clad on the outside, the tinning to return over the lower edges.

(*c*) On other buildings, if not in accordance with the foregoing, and of frame, to be thoroughly tin-clad on the outside, the tinning to return over the lower edges.

24. Fastening.—All scuttles are to be fastened by means of strong steel or wrought-iron, galvanised hinges, bolted to scuttle and combing or roof.

25. Stops.—All scuttles to be provided with suitable stops, consisting preferably of a strong chain, bolted to scuttle and combing, allowing the scuttle to open slightly beyond a vertical position.

26. Ladders.—Permanent ladders should be provided, giving access to scuttles.

CLASS E. OPEN AIR OR LIGHT SHAFTS.

27. Lights.—All lights at bottom of open shafts or wells, if not of thick glass prisms set in substantial cast iron frames, shall be in accordance with sections 1, 2, 3 or 4), 13 (provided wired glass not not less than $\frac{1}{2}$in. thick and no wire cloth of less than No. 12 wire or over $\frac{3}{4}$-in. mesh be used), 14, 15 and 16, class A, and furthermore conform to the rules governing other types of skylights as noted under class A if such types of lights are used.

27. Protection of Shafts.—The tops of all open shafts shall be covered by galvanised steel wire cloth screens of not less than No. 12 wire nor over $\frac{3}{4}$-in. mesh, constructed and secured in accordance with section 15, class A.

Reinforced Concrete Strong Rooms.—The excellent fire-resisting qualities of reinforced concrete have brought about a comparatively new application of this material—namely, the construction of fire-resisting and burglar-proof strongrooms. We are informed that the Coignet system has recently been employed and is at present recommended by several well-known London architects for this purpose. The report issued by the British Fire Prevention Committee on a test of a large floor on the Coignet system has demonstrated in a very satisfactory manner what may be expected from this method of construction.

STOCKTON THEATRE FIRE

The fire at the Theatre Royal on August 28 was remarkable for the rapidity with which, having once obtained a hold, the flames gutted the entire building. The outbreak was discovered through the smoke and flames issuing from the skylights over the stage at a few minutes past 11 p.m., only six minutes after the front of the house had been locked up for the night. The captain of the fire brigade was in the theatre on the night of the fire until 10.50, and observed nothing unusual when leaving, after looking round. He had scarcely reached home, however, before a telephone call was received notifying the brigade of the outbreak. Four minutes later the first jet of water was playing on the flames, and the brigade steamers followed soon afterwards. The fire evidently originated in the "flies," and quickly spread to the front of the house between the ceiling and the roof, owing to the fact that the proscenium wall did not extend even to the top of the arched opening, leaving an open space above. There were also several openings with ordinary wooden doors in the proscenium wall on the prompt side, by which the flames gained access to the auditorium. The asbestos curtain was consequently of little value in checking the spread of the fire. Other openings on the side of the stage communicated with the annex containing dressing-rooms, bars, and entrance to gallery. Further, the interior construction was chiefly of wood! With these conditions in its favour, the fire made short work of the theatre, laughing at the efforts of the firemen, who had perforce to content themselves with the prevention of injury to the adjoining properties. The loss will reach £10,000, but the disaster was a trivial matter compared with what it would have been had the fire broken out during a performance, for the loss of life must inevitably have been very great. The theatre was built in 1866.

THE BRISTOL FIRE.

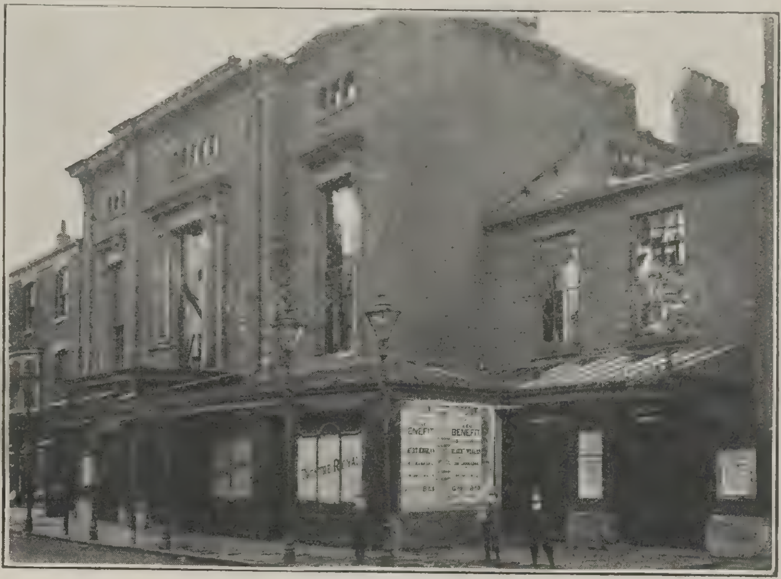
The disastrous fire at the Merchant Venturers' Technical College in Unity Street, Bristol, which occurred early on the morning of the 9th instant, has been the subject of many conflicting reports in the daily press.

The fire broke out in the top storey and soon spread to the second floor, and within ten minutes the whole structure was in flames from end to end. The top portion of the building was used as a laboratory, and it is conjectured that the outbreak was probably due to the combustion of chemicals. The college was originally erected about 22 years ago by the Society of Merchant Venturers at an outlay of some £50,000, which is covered by insurance. Mr. E. C. Robins was the architect of the building.

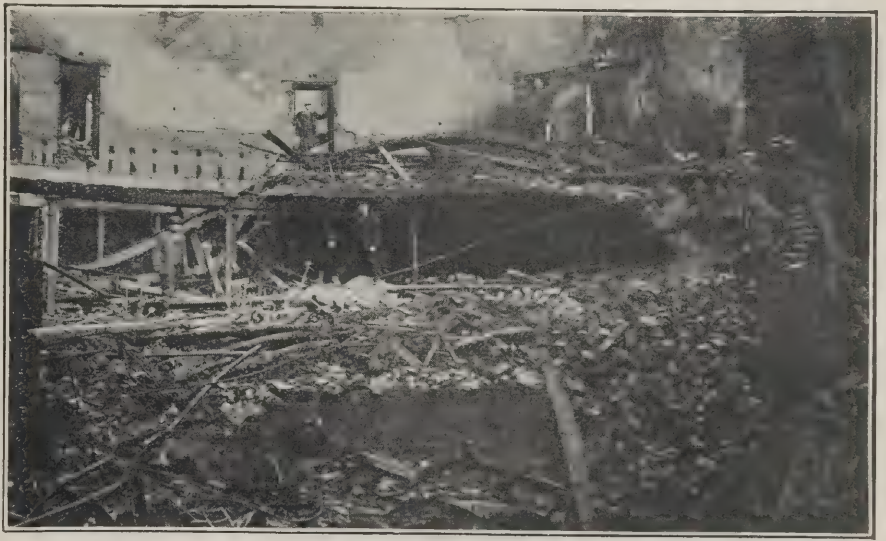
The construction of the building has been variously described; some accounts stating that "*the main portion of the structure was of pitch pine,*" while others referred to the building being constructed on "*the fireproof principle,*" and failure of fireproof floors were (in the local press) described as having occurred in certain portions of the building where the floors were entirely of wood construction.

A careful examination of the building having now been made, and the state of the structure compared with the actual working drawings of the floors, etc., we are able to state definitely that the use of fire-resisting construction was confined mainly to the ground and first-floor levels, but even at the the first-floor level the fire-resisting separation was not complete, as the class rooms between the great hall and Unity Street had ordinary wood joists and boarded floors.

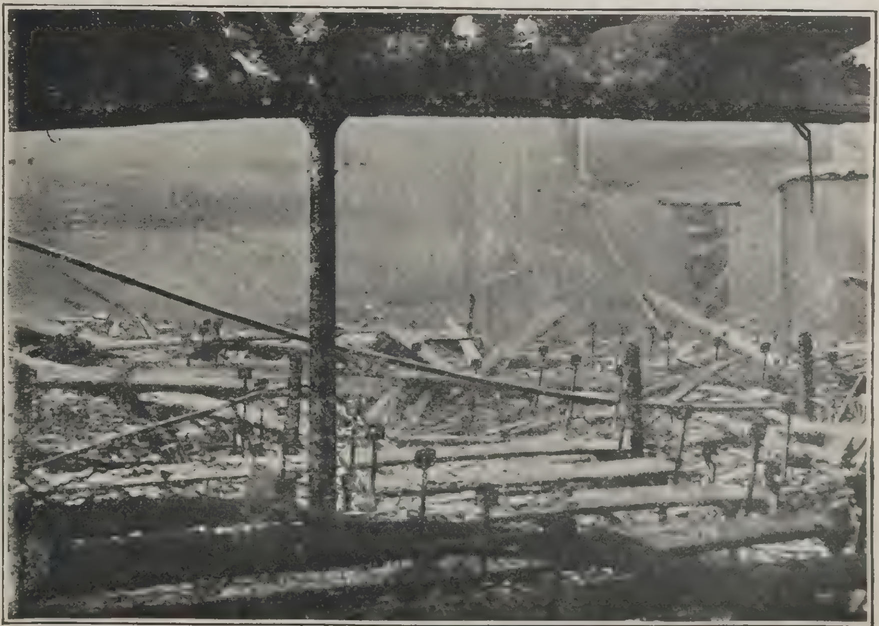
Above the first-floor the construction of the floors was mainly as follows:—



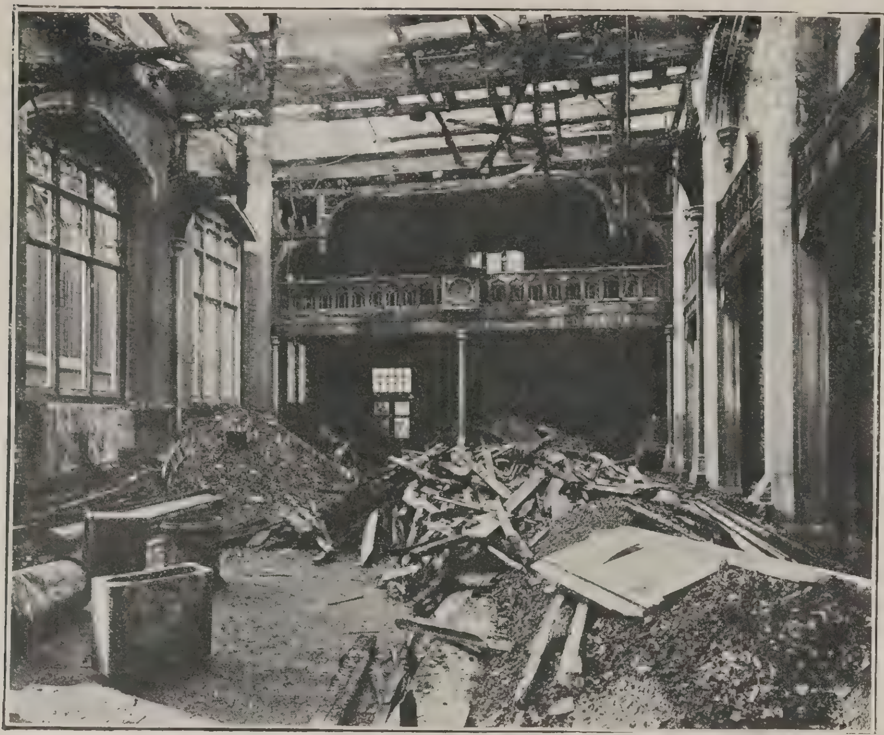
THEATRE ROYAL, STOCKTON-ON-TEES.



VIEW LOOKING FROM STAGE.



THEATRE ROYAL, STOCKTON-ON-TEES: VIEW LOOKING TOWARDS STAGE.



GREAT HALL, SHOWING DEBRIS ON CONCRETE FLOOR.
The Floor remaining over the end gallery is of concrete; the rest was wood.

Iron girders spanning from wall to wall, and spaced from 12 ft. to 14 ft. apart, supporting wood binders, and upon the top of these rested the ordinary wood floor joists with ceiling fillets beneath.

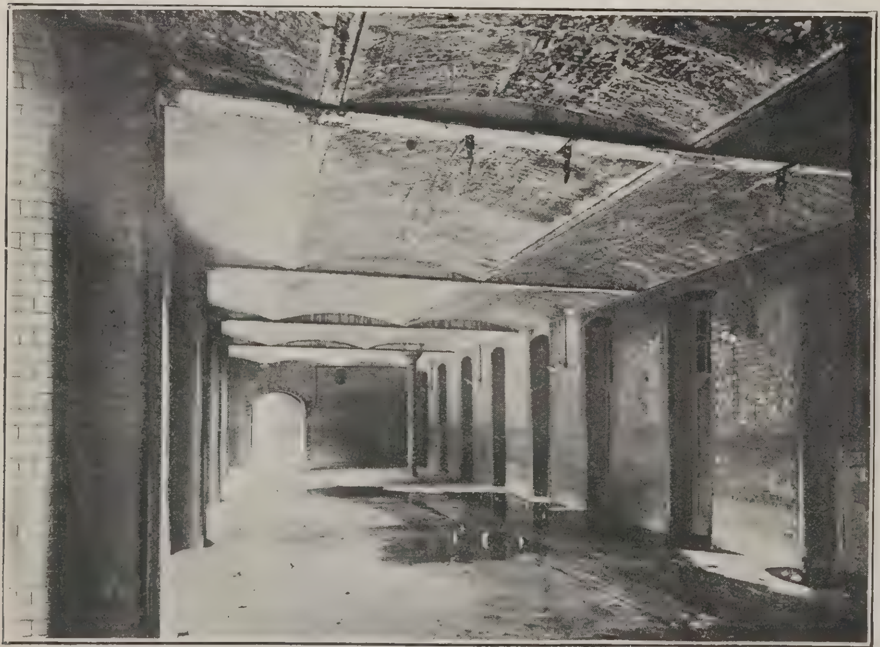
The whole of these wood-constructed upper floors are entirely burnt out, and the wooden portion of the first floor above referred to next Unity Street, although not entirely destroyed, has suffered considerably from the fire and falling debris—and there are several large holes in it where the falling materials have dropped through to the ground floor.

Fire-resisting construction was used on the upper floors to a very limited extent, and mainly to landings and one or two rooms which were probably intended to be used for some special purpose. Wherever fire-resisting floors existed they remain intact, and no failure of concrete floors has occurred in any part of the building.

It was only at the first-floor level that concrete floors were adopted to a sufficient extent to form a fire-resisting separation, and here they have served their purpose—the fire not having extended below the fire-resisting portion of this floor at any point.

The interior of the great hall presents many interesting features. The hall is bare, and open to the sky, but iron girders with charred fragments of wooden floor joists hanging to them still span from wall to wall.

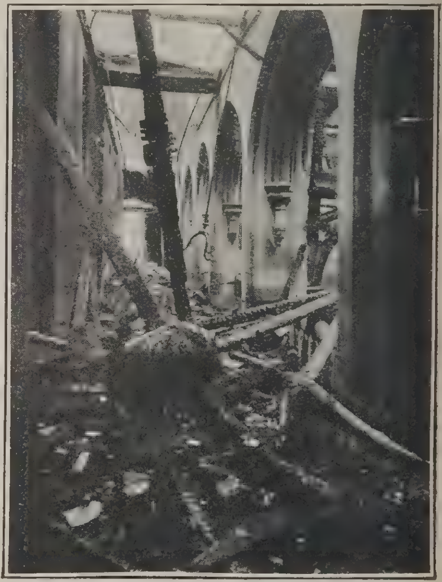
The only portion of fire-resisting floor over this hall is immediately above the end gallery, and this remains rigidly in its place (as shown in our view), although piled up with wreckage from the falling woodwork and covering of the roof. Portions of the panelled ceiling remain almost intact where constructed below this concrete work, and serve to show the elaborate nature of that which is gone. Even the wooden gallery received so much protection from the concrete floor above that it is not greatly damaged.



ARCHED CONCRETE FLOOR BELOW GREAT HALL.
The Iron Column shown is the lower part of the one under gallery clock in view above.

The concrete floor of the side gallery is also intact, and supports a large quantity of debris (see view). This floor (as well as other portions of the concrete construction) was subjected to very severe test; the fire attacking it from below, as well as from above; and it had also to sustain heavy strains of impact from falling beams, etc., of the wooden floors and roof work.

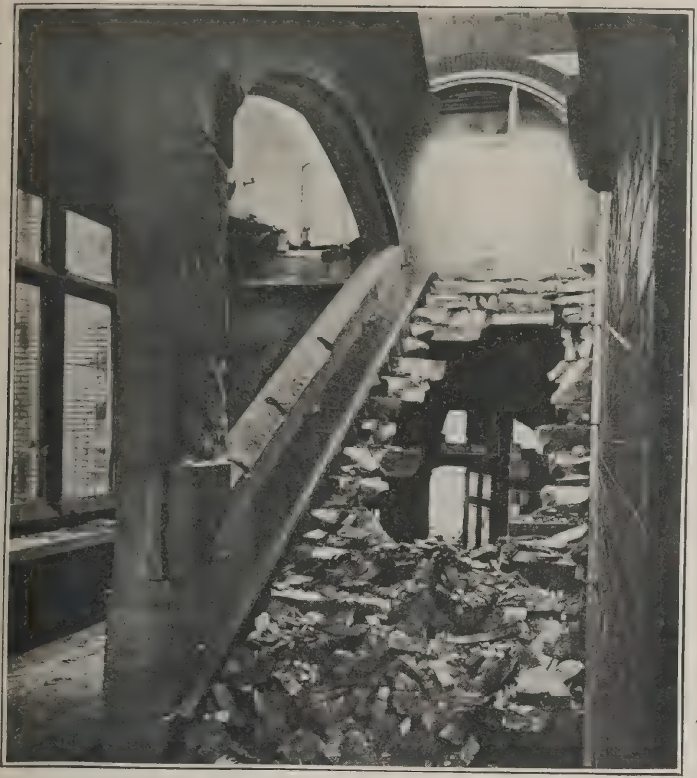
The fire-resisting floor of the hall is piled deep with wreckage, but the floor itself stands firm. Passing down the stairs, and walking under the floor of the hall a remarkable contrast to the scene above is noticed. The ceiling overhead (the floor of the great hall) which was executed some 24 years ago by Messrs. Dennett and Ingle, on the arched form of concrete work peculiar to their method of constructing fire-resisting floors for large spans, is quite perfect, and appears to have suffered no damage from the impact of falling debris.



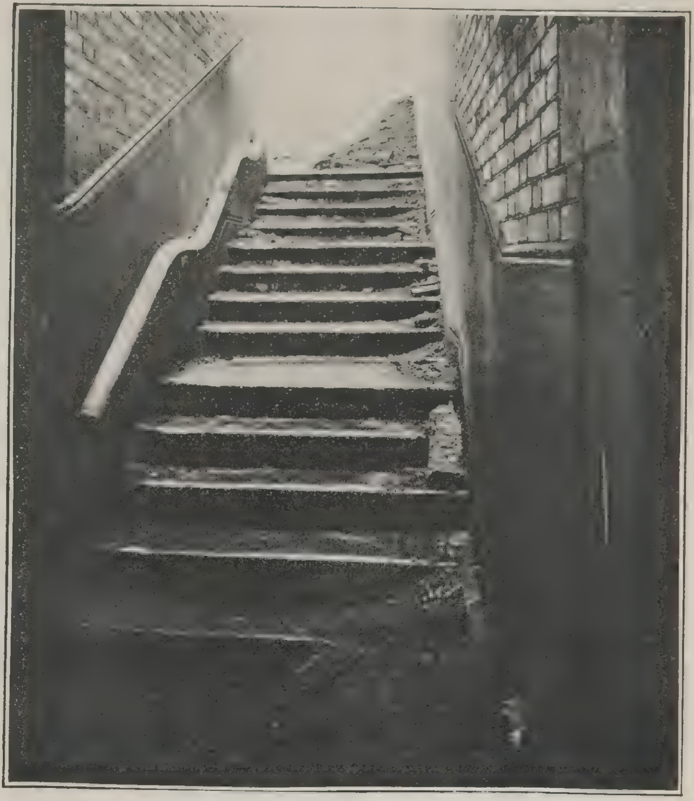
SIDE GALLERY OF GREAT HALL,
SHOWING DEBRIS ON CONCRETE FLOOR.

Further examination of the upper floors demonstrates in a forcible manner the superiority of concrete over stone for stairs and landings. At the Denmark Street end of the great hall a large flight of stone stairs is practically destroyed above the first floor, and was perhaps not badly described in a fire official's report as having "exploded." As a contrast to this, a main flight of stairs at the opposite end of the building constructed in concrete, and with stone finishings to treads and risers remains intact from top to bottom. We give views of these two stairs.

Generally, the partially-wrecked building presents a valuable object lesson. Constructed, as it was, partly of combustible, and partly of fire-resisting materials, it affords an excellent testimonial to the latter method of construction, and emphasizes the importance of not half-heartedly adopting it.



The Destroyed Marble Staircase.



The Concrete Staircase which Remained Intact.

THE FIRE AT THE MERCHANT VENTURERS' TECHNICAL COLLEGE, BRISTOL.

FIRE TESTS.

A Reinforced Concrete Floor.

We have from time to time recorded fire tests conducted by the British Fire Prevention Committee on floors of reinforced concrete, and we understand this series is being continued and remains the only series of such tests with floors of large area so far undertaken in any part of the world; the United States' tests generally being with floor sections of smaller area.

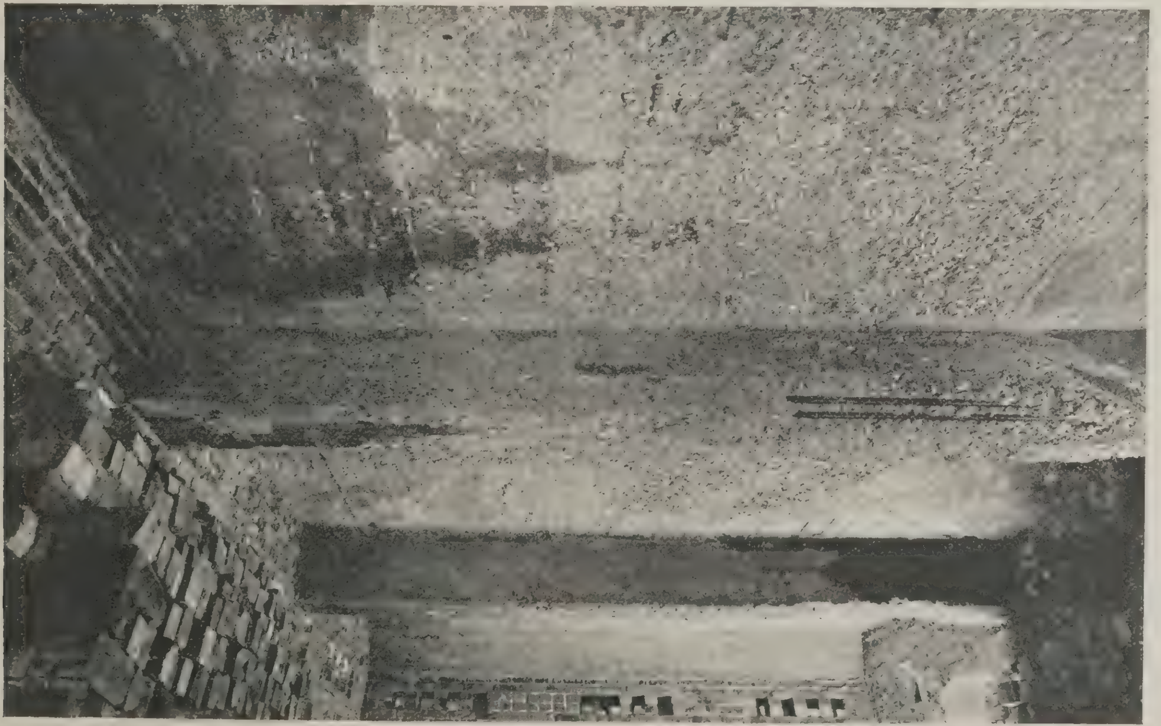
We can do no better in this case of a floor constructed by the Patent Indented Bar Co., Ltd., than to simply present the object and the summary of the test, and to note how the highest classification —namely, that of the fully protective class B—was obtained with a very small deflection of three-quarters of an inch on the beams. We also give Mr. Marsland's preliminary note.

The most important point raised is that contractors cannot be too careful in seeing that their metal work is properly protected, for even in this test case, where the protection of certain rods was intended to measure one inch, the rods had apparently been trodden down during building operations, so that they were just below the soffit. It is one of the great dangers of reinforced concrete intended to be fire-resisting that such rods are liable to be trodden down during the time that the work is being executed, and for that reason alone it is desirable to specify the position of the rods, so that there may be a margin for such deflections or bendings that may take place during construction.

Mr. Marsland's Note.

The test reported does not add materially to the knowledge obtained from former tests of a similar character.

It, however, emphasises the lessons taught by former experience, viz., that



FIRE TEST ON A REINFORCED CONCRETE FLOOR CONSTRUCTED WITH INDENTED STEEL BARS.
GENERAL VIEW FROM BELOW, LOOKING NORTH (AFTER TEST).

however carefully the rods are fixed they get to some extent displaced while the concrete is being filled in.

Some of the rods to the bays were found to be just under the soffit of the concrete, whereas they were supposed to be one inch from it. The result was that the bays deflected in addition to the beams in consequence of the weakening of the bars by reason of their becoming heated.

The occasion of this report is taken to remark that, for floors tested in the future, it might be advisable to uniformly limit the area of the cross section of the beams employed in proportion to the span and load. Attention should in future be called to the factor of safety calculated.

Object of Test.

To record the effect of a fire of four hours' duration, the temperatures to reach 1,800 deg. Fahr. (982.2 deg. C.), but not to exceed 2,200 deg. Fahr. (1,204.4 deg. C.), followed by the application of water for five minutes, with a view to classification under "Full Protection" (Class B).

Note.—The area of the floor under investigation was to be at least 200ft. super. (18.58 sq. metres). The floor was to be loaded with 280lb. per sq. ft. (1,367 kilos. per sq. metre) distributed.

The area of the floor in this case was 410ft super. (38 sq. metres), divided into three equal reinforced concrete bays, supported by two reinforced concrete beams, the beams had a span of 15ft. (4.57 metres), the bays measured 15ft. by 7ft. 5in. (4.57 metres by 2.26 metres), centre to centre, the flor was 6in. (0.152 metre) thick, and the depth of the beams below the floor was 17in. (.43 metres). The load was 280 lb. per sq. ft. (1,367 kilos. per sq. metre). The water was applied for five minutes.

The time allowed for drying was 39 days (summer).

The centering was struck after 14 days.

Summary of Effect.

At the expiration of 15 minutes, the floor began to deflect, and continued to do so till the end of the test, when a maximum deflection of .90in. (.0229 metres) was registered.

On the application of water the concrete to the soffit of the beams, where struck by the jet, was knocked off, exposing the rods in the lower part of the beams. The soffit of the floor was also eroded where struck by the jet.

On the load being removed, the surface of the floor showed various cracks. The permanent set of the floor over the beams was average ¾in. (.019 metres) and the permanent set of bays between beams was average ¾in. (.019 metre).

Neither fire, smoke or water passed through the floor.

Classification, fully protective (Class B), was obtained.

Correspondence.

Fireproofing Scenery.

To the Editor of The Builder's Journal.

Sir,—The address by Mr. Freeman before the American Society of Mechanical Engineers, which you published in your "Fire Supplement" for September 26th is an exhaustive account of certain means for safeguarding theatres from fire; but with due deference to Mr. Freeman I venture to say that a far more economical and reliable method than any he suggests is to render all the materials used for and on the stage flame-proof by chemical impregnation. If this is carried out properly there need not be the slightest fear even of a small fire occurring, whilst at the same time it renders any other safeguard against fire unnecessary.

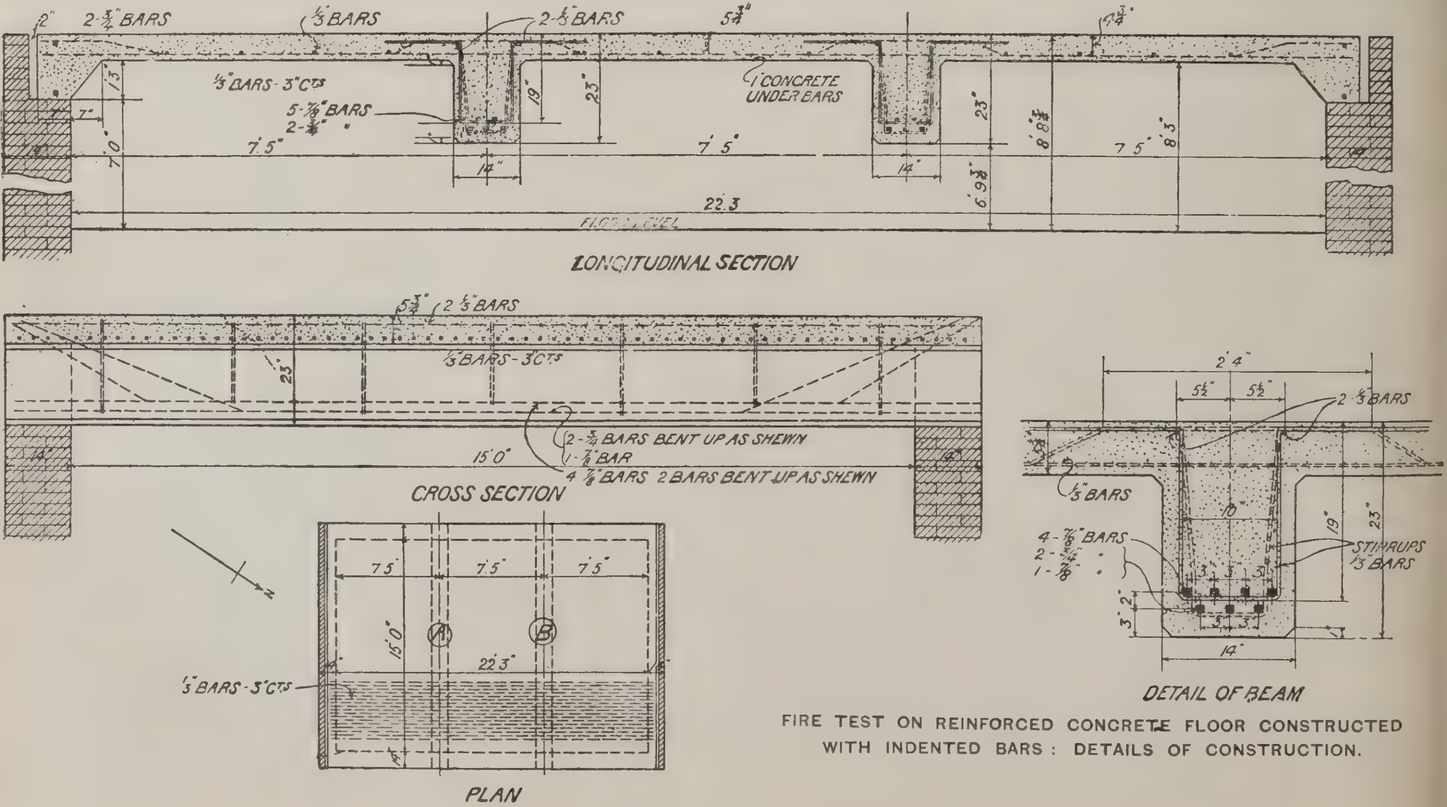
Upon this matter Mr. Freeman says: "After having investigated the question of fire-proofing the scenery, I am led to believe that we must after all rely on the safeguards of the engineer rather than those of the chemist. The efficient fireproofing of the great quantity of white pine (8,000 sq. ft.) appears to be a practical impossibility."

It is this statement that I am more particularly concerned with, and why in the name of all that is veracious Mr. Freeman should make such a statement, when the briefest enquiry on his part would have shown him that hundreds of thousands of people in London know from personal experience the exact contrary to be the fact, for the entire woodwork of all the cars of the District Railway (Yerkes' system) has been rendered flameproof by chemical impregnation. Every door, all the flooring, every seat, all the panels, window-frames—in fact, the whole of the woodwork, amounting to about 500 cubic feet in each car, or a total for the 500 cars of about three million sq. ft., consisting of ash, mahogany, Oregon pine maple and whitewood—have all been rendered flame-proof by chemical impregnation. These cars, some of which have been running for upwards of two years, are an existing proof of the fact that wood can be rendered thoroughly flame-proof by impregnation, and more than once they have been saved from destruction by fire, because the wood was flame-proof.

How many millions of feet of flameproof wood are in use in America statistics do not show, but from the fact that within the past few years no high buildings have been erected in some of the States unless the woodwork had been rendered flame-proof there can be hardly any doubt that there are millions upon millions of feet of treated wood in practical use in that country. In France also the use of chemically-treated wood is becoming very extensive.

With reference to theatres, Mr. Freeman has only to consult the regulations of the London County Council, and those of Bradford, Bath, Bristol, Birmingham, Edinburgh, Glasgow, Newcastle, Sheffield, &c., to find that all scenery must be rendered and maintained uninflammable; and whilst this wise provision for safeguarding life and property is not as yet universally followed by the theatres, many of the leading ones are spirited enough to comply with the law, and the consequence is their scenery is uninflammable.—Yours faithfully,

A. W. Baxter, A.M.I.N.A.



FIRE TEST ON REINFORCED CONCRETE FLOOR CONSTRUCTED WITH INDENTED BARS: DETAILS OF CONSTRUCTION.

THE BUILDERS' JOURNAL

AND ARCHITECTURAL ENGINEER.

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Differences about Rights of Light. It is a deplorable fact that some thousands of pounds in legal costs have been incurred in connection with the interference of light to a sitting-room not 14ft. square in a small suburban house at Ealing. This is the case of *Kine v. Jolly*. Rights of light and air have been the subjects of innumerable disputes and law cases, and there is no indication that matters will be any better in the future. The evil has a two-fold aspect. In the first place, it seems quite unsatisfactory that there should be any such things as "ancient lights," bearing in view what power these put into the hands of the owner to exercise for his own benefit, irrespective of the needs of his neighbours. The law was formerly understood to mean that one had a right of action if it could be proved that the light had been diminished, but the celebrated case of *Colls v. Home and Colonial Stores* quite upset that idea, establishing in place that there could be no case for damages or an injunction unless the obstruction amounted to a nuisance, and so long as there was enough light for the ordinary purposes of habitancy or business. This reading of the law is juster and better than the old one, but it has put the matter very much in the hands of witnesses, for each case has to be proved by specific evidence as to whether or not there remains the sufficiency of light on which everything depends. In the particular action about the suburban house at Ealing mentioned above, it is worth noting how opinion has differed even among the judges, for when the case was brought to the Court of Appeal from the King's Bench Division Lord Justice Romer dissented from the finding of his two colleagues, and when the case came finally before the House of Lords last Thursday two out of the four judges were unable to agree with the finding of the other two, and so the case stands at the judgment of the Court of Appeal. We have no intention now of reciting the details of the case, which will be found reported in our issue for December 21st, 1904, when the action was heard in the Court of Appeal, but we would take this opportunity to point out how unsatisfactory this law of rights of light still is; and especially would we emphasise how involved the judgments are. Mr. Justice Kekewich, for instance, said that the erection of the adjoining house had altered the character of the room, "and that, though still a well-lighted room, it has lost in the obstruction of light one of its chief charms and advantages"—which draws the delicate distinction between an "exceptionally well-lighted" room and a "well-lighted" room: a point for lawyers, but not for reasonable beings.

Opportunities Abroad. It has often surprised us that, with the depression in the architectural profession in this country, clever young men have not more often looked abroad for openings. They seem to limit their range of outlook to our Colonies, but it is evident from the fact that the public in the United States call upon American architects to provide houses purporting to be designed "in the English style" that there is an opening there for English draughtsmen, if not for English architects in practice for themselves. The efforts which American architects make to meet this demand, as one may see by American publications, cannot be called successful. It is true that a few architects who have specialised in domestic architecture have succeded in producing a very fair suggestion of English work, but the large majority of the attempts made are a distressing combination of half-timber applied to the Colonial style. If we in this country do not excel in the design of public buildings, we have at any rate a pre-eminent reputation for good domestic work and church architecture. This being so, and with the feeble efforts before us of American architects trying to supply the demands for houses in "the English style," it certainly seems to us that capable young men now bemoaning their fate here should be able to find employment in the offices of American architects. It is, perhaps, doubtful if they would at first be welcomed practising on their own account, because the ordinary American citizen is rather antagonistic to the Britisher, though the German, the Austrian and the Pole are welcomed with open arms. The opportunities of employment are not confined solely to domestic work either, because church work is just as badly done by American architects, who seem to perpetuate the miserable work done at the tag-end of the Gothic Revival. Just now, we notice, Mr. Bodley is engaged with the design of the huge cathedral proposed to be erected at Washington, and we remember, also, that the late J. F. Bentley was asked to submit a design for the New York Roman Catholic cathedral. These are the opportunities of the great, of course, but for capable men in a humbler sphere there should be openings; and although the possibilities are greatest in America, there would seem to be chances, too, in Germany, Austria and France. Inspection of the publications of these three countries shows that there are very few perspective draughtsmen of ability there. The German draughtsman inclines to the grotesque and the crude, the Austrian is very little better, while the French draughtsman is too mechanical and unimaginative. As for French domestic work, it can hardly be said to exist. The houses are more or less copies of town halls and châteaux, and they are devoid of homelike feeling. So far as Germany and Austria are concerned, the appreciation of English domestic architecture is pronounced, as proved by the close attention which German architects pay to the English architectural and art publications, though they apply the information without real understanding. If the Germans copy our "art and craft" furniture, decoration, and domestic work, there ought surely to be an opening for the English designer to apply his profession first hand; and the enthusiasm with which a few of our leading English designers have been received—Mr. Walter Crane and Mr. Gordon Craig, for example—would suggest that the architect might stand a greater chance of receiving a welcome on the Continent than in the United States.

ALL SAINTS' CHURCH, TOOTING GRAVENEY. TEMPLE MOORE, ARCHITECT.

ALL SAINTS' CHURCH, TOOTING GRAVENEY.

The new church of All Saints, at Tooting Graveney, shown by the accompanying illustrations, will well repay a visit. It is not far from the Tooting terminus of the L.C.C. electric trams. For external effect it depends upon outline, appropriate and simple fenestration, and an austerity which is one of the principal charms of old work. The plan includes nave and choir of seven bays, with a Lady Chapel beyond. The length of the nave and choir is 130ft., and the height to the crown of the wooden groined ceiling is 55ft. The nave arcade is flanked on either side by double aisles, divided by slender columns of grey Forest of Dean and Quarella stone, moulded with much refinement. The nave aisles are roofed with a wooden ceiling, which gives opportunities for suitable enrichment. The tower makes a fifth bay to the left aisle and an organ transept and ample vestries connect the right-hand aisle of the choir with the vicarage. The choir aisles make a fine external feature and give an airy sense of space to the interior of the choir. The internal appearance of the three arches behind the High Altar, through which one catches a glimpse of the Lady Chapel, is very happy. Above are three windows which light up the groining internally and add much to the exterior effect of the choir. The wooden groining of the nave roof is quadripartite; the architect's construction has made it quite clear that the groining is wood, not stone. The ribs are closed at the apex by richly-carved bosses. A bold effect is obtained throughout the building by taking advantage of the ample dimensions of the walls to provide dignified window splays. At the narthex end of the church these splays are 3ft. 6ins. wide, the wall itself being 4ft. 3ins. The Gothic fittings designed by Mr. Temple Moore for the choir and sanctuary have not been carried out. In their place Italian stalls, veneered with walnut and provided with canopies, have been fixed. The church alone, exclusive of fittings, has cost £23,000. Messrs. S. Sherwin and Son, of Boston, were the builders.

ALL SAINTS' CHURCH, TOOTING GRAVENEY. TEMPLE MOORE, ARCHITECT.

R.I.B.A. EXAMINATIONS.

Model Answers by A. G. Bond, B.A., A.R.I.B.A.

The Final Examination.

(*Continued from page* 191, *No.* 610.)

Subject V.—Specifications, Estimating and Professional Practice.

[*Time of examination, three hours. Maximum number of marks, 75.*]

1. *Write a specification for all trades for an asphalted flat roof over a hall 25ft. square to a public building, and provided with an octagonal dome, 15ft. diameter, glazed on all sides and finished inside with plaster enrichments.*

Note.—In a question of this sort it is always necessary first of all to make a rough sketch of the scheme proposed as a definite basis upon which to write the specification. The basis adopted will of course vary, and consequently the various specifications may be very different, both in the number of trades and length, but the answer should be comprehensive; the course adopted in the following answer will be found a wise one to follow:—First of all the sketches are made, then the various trades included are written down, then a list of the clauses under each, and lastly the clauses themselves are written out at length. If the candidate, following this method, finds he has only time to write a few specimen clauses in full his work will, nevertheless, show he has a thorough knowledge of the subject.

Trades included.	Clauses in each trade.
Concretor	Concrete in flat (aggregate, matrix, reinforcing, asphalt, mixing, &c.)
Carpenter	Centering, bracketing and cradling.
Founder and Smith	R.s.j.'s, glazing bars, &c., of dome light, r.w. gutters and pipes.
Plasterer...	Materials, floats to concrete soffit, cornices, fibrous plaster. Make good.
Plumber...	Wire covers, pipes to cesspools, ridge-piece.
Glazier	Wired glass, inner dome with lead lights.
Painter	Painting on iron, distemper touch-up

Specimen Clauses.

(For the remaining clauses the reader is referred to the latest issue of "Specification.")

Concretor.—The concrete for flat to be composed of two parts coke breeze, 2 parts broken brick, and 1 part Portland cement (all as before specified), to be measured with proper measures, thoroughly mixed dry on a wooden platform, and water then added through a rose-head; the concrete shall then be turned over and thoroughly mixed and immediately deposited. A layer of expanded steel as before specified shall be laid direct upon the centering and round the r.s.j.'s, and the concrete shall be well worked into this so that it is entirely en-

Concrete in flat.

cased—the finished thickness of the concrete shall not exceed 6¼ins., nor be less than 6ins., and all r.s.j.'s shall be encased with a protection at least 2ins. thick of concrete beyond surface of web or flange.

Plasterer.—All cornices to be run clean and accurately to design. Run moulded

Cornice.

plaster cornice 18-in. girth to walls and main girders and the upper members, 12-in. girth to subsidiary girders, with all mitres, returned and stopped and mitred ends, &c., truly worked as required.

Painter.—All exposed ironwork is to be properly freed from rust, scale, etc., and

Painting to Ironwork

painted two coats red lead paint before fixing. The external work is to be painted two coats, but only to approved colour, and internal work one coat white and one finishing coat aluminium paint after fixing.

2. *Write out fully the "general clauses" in a specification governing bricklayers', masons', carpenters', and joiners' work.*

Note.—There is room for great divergence of opinion as to the scope of this question, and an endeavour has been made to take a medium course.

Bricklayers' General Clauses.

1. All bricks to be the best of their respective kinds, hard, square, sound, well burnt, non-absorbent, and even in size.

2. All bricks to be well wetted before laying, except during frost.

3. No portion of the work shall be carried up more than a scaffold height above another part without the architect's written permission.

4. All brickwork shall be protected against frost, and any work injured thereby shall be reinstated.

5. Walls shall be well bonded both laterally and transversely with the fewest straight joints possible; unless otherwise directed the facings are to be in Flemish bond, and the rest of the brickwork in Old English bond.

6. The height of four courses of bricks laid in mortar is not to exceed by more than one inch the height of the same bricks laid dry.

7. Build in, or cut, bed and pin in, all sills, thresholds, steps and landings, templates and corbels and ends of posts, &c., in cement.

8. Build in frames and point in lime and hair mortar.

9. Cut away for and make good after all other trades as required.

Masons' General Clauses.

1. The whole of the stone to be of the best description of its respective kind and to be free from sandholes, vents, flaws and all other defects, laid on its natural bed unless specially directed otherwise, in fine mortar, cleaned down at completion and left perfect.

2. Any stone injured during progress of the work or found to be broken or defective at its completion is to be cut out and replaced by the contractor.

3. Every stone to hold its full length and height square to the back.

4. Supply all necessary lewising and drilling for anchors by the stonecutter and hoisting and fitting at the building.

5. All stones to be well wetted before setting, except during frost.

6. No angle mitres are to be used.

7. Clean down the masonry work and generally leave the whole perfect and complete, omitting no material or workmanship described or implied by the drawings or this specification, or that is necessary to render the whole complete in every respect.

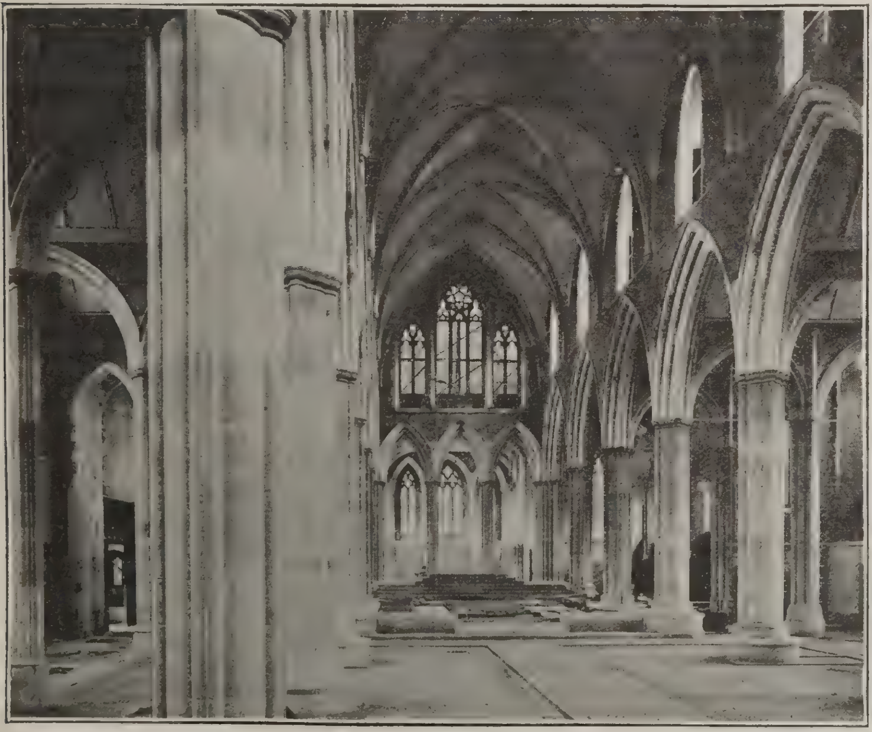
Carpenters' General Clauses.

1. The whole of the timber to be sound, well seasoned, free from sap, large, loose or dead knots, waney edges and other defects, and to be sawn die square.

2. Timbers of large scantlings to be sawn immediately upon the signing of the contract.

3. Cut away for, attend upon and make good after all other trades.

4. The whole of the work is to be framed, trussed in the best possible manner and fitted with all necessary bolts, straps, &c., required.



ALL SAINTS' CHURCH, TOOTING GRAVENEY. TEMPLE MOORE, ARCHITECT.

Joiners' General Clauses.

1. All timbers, deals, &c., used for joinery must be thoroughly well seasoned.

2. All joinery is to accurately set out in accordance with the detail drawings and finished off in a workmanlike manner.

3. The dimensions and thicknesses figured on the drawings or described in this specification to be the finished sizes when fixed in the building.

4. All joinery to be cut out and framed together immediately after the commencement of the building, but not wedged up until just before fixing.

5. Any joinery found to warp, shrink or develop shakes or other defects is to have the defective parts replaced with new before wedging up.

6. All glue joints to be cross-tongued.

7. All joinery to be fixed to elm pads or, where directed, to framed grounds, backings and other fixings in the most workmanlike manner, and attend upon and cut away for and make good after all trades as required, and leave all joinery perfect at completion; any shrinkage or other defects showing within six months from the date of completion will have to be replaced or made good at the architect's discretion at the contractor's expense.

3. *State approximately the cost per cubic foot of a high-class residential building executed in:—*

(a) Brickwork with best quality red facings.

(b) Portland or other hard stone facings.

Also give the price per cubic foot of Portland or other hard stone worked as ashlar.

Estimating the cost of a building by "cubing" is such a very approximate method that the difference between the facings would hardly have so much effect upon its accuracy as the relation of voids to solids or the quality of the internal finishings, &c.; again, the comparative price would vary with the locality; perhaps in London one might allow 1s. per foot cubic for the red brick faced building, and 1s. 3d. for the Portland stone one, but it would generally be best in such a case to take off roughly the superficial area of the facing and ascertain the total difference in cost by finding the comparative price per foot super. thus: the Portland stone ashlaring could be taken at about 2s. per foot super. extra only on common brickwork, while the best red facings can be taken at 9d. per ft. super.—that is to say, an extra of about 1s. 3d. per foot super. of facing would be entailed by using Portland stone.

The current price per foot cube of Portland stone (White Basebed) delivered on road waggons at the London depôt is 2s. 2½d. The price for the stone worked as ashlar depends, of course, upon the superficial area of the worked face, and therefore varies with the thickness of the bed face; it is therefore generally priced at per foot super. and varies from 2s. 6d. per foot super. for 4-in. bed face with plain joints, to 4s. per foot super. for 5-in. bed face, with rubbed facing, and including bonding stones.

4. *If you are acting for a client in rebuilding his premises, what are the points affecting him with regard to his neighbour's rights, and what precautions would you take to safeguard your client in the event of litigation?*

The points affecting the client in connection with his neighbours can be divided into three divisions—viz., (a) those easements acquired naturally or by grant; (b) those regulated by Act of Parliament; (c) those regulated by the title deeds or lease. The most often occurring are (1) light and air; (2) public or private rights of way; (3) rights of adjoining owner as to footings, support, party walls, eaves, &c.; (4) lines of frontages, vaults, &c.

Of these (1) is by far of the most frequent occurrence, and in almost all cases (at any rate in town property) it is wise to make careful record drawings of the existing premises; these may be supplemented by photographs and models, and should be verified, checked and signed by a second surveyor; it is often done by the district surveyor. Where practicable, retain the client's old lights in exactly their former positions and avoid all undue interference with the ancient lights of any neighbouring property.

(2) Public rights of way must be respected. See London Building Act, section 71, for construction of arches, &c., over same.

Private rights of way may have been acquired by express or implied grant or by prescription—*i.e.*, uninterrupted use for 20 years, and must be respected unless extinguished by express release or abandonment for 20 years.

(3) Footings.—The rights of the building owner in respect to these vary in different localities. In London he has the right to cut away any footing or other projections from any party or external walls in order to erect an external wall against such structure, upon condition of making good any damage caused by the operation.

Support.—In absence of a binding engagement to the contrary, every man having land adjoining that of another has a right to require the other to continue the support afforded by the soil of his land to the soil and also to any ancient (20 years) structure built thereon, and even in the case of a more recent building must use due care to avoid damage.

Party Walls.—The rights in regard to these are set out in the London Building Act, sections 87—101. The prescribed notices must be served before they are interfered with.

Eaves.—Rights of eaves and of rainwater or other pipes, &c., must be respected if "ancient."

(4) Lines of Frontage.—If an old building is taken down to the extent of more than a half of its cubical extent the Council may require it to be set back to such general building line and in such a manner as the Council shall direct, but shall compensate the owner for any damage or expenses which he may sustain or incur thereby. Such general building line to be laid down by the superintending architect; it can be brought before the Tribunal of Appeal by objector thereto.

Buildings may, under special circumstances, be brought beyond this line if the forecourt be dedicated to the use of the public, or upon any other condition agreed between the building owner and the Council.

Sometimes the line of building frontage may be governed by the conditions upon which the land was originally bought or the estate laid out for building.

Certain projections are allowed for pavement lights, bays, cornices, &c.

Vaults, &c.—Not to extend under the public way more than the width of pavement or 10ft., whichever be the lesser.

Area gratings or pavement lights not to project more than 1ft. upon the public way.

5. Certain work is being executed in a building over and above that included in the contract. How would you exercise a control over it in the matter of the final settlement of accounts?

The architect should make a practice of giving a written order on a special form for every variation before its execution and allowing none to be made without such order; this saves a great deal of trouble and dispute at the final settling up; if the "extra" is such that its value cannot readily be ascertained from the priced bill of quantities or schedule, it is safer to obtain an estimate from the contractor before the order is given and to specify the amount agreed upon the order. Of course, in many cases the valuing of the variations is left entirely in the hands of the surveyor, and his decision is held to be final, but in all other cases the course suggested above is the most satisfactory.

(To be continued.)

[*Answers to the questions set in the Intermediate Examination were given in our issues for July 11th, July 25th and August 8th last, and to Subjects I., II., III. and IV. of the Final Examination in the issues for September 5th, September 26th and October 17th.*]

Correspondence.

Cutting Moulds for Flat Arch.

To the Editor of The Builders' Journal.

Sir,—Referring to the answer given to the enquiry on the above in your issue of the 10th inst., allow me to draw the attention of "G. R. B." and "Mason, Sunderland," to an error in the projection of the joint moulds. These moulds cannot be projected from the developments as shown in Fig. 4. Their lengths must be equal to that of the radiating joints to which they refer: thus, the total height of the joint mould No. 2, Fig. 4, should be equal to the length of the line *f.g.* Fig. 3, and not equal to the vertical height of the stone. The long edges of the joint moulds would be slightly curved, more or less, depending on the inclination of the radiating joints, and the vertical height of check on the joint mould would be greater than its vertical height taken at the centre line of arch. Should the radiating joints happen to be inclined at a lower angle than that shown, then these inaccuracies would become more apparent.—Yours truly,

Glasgow. J. S. B.

To the Editor of The Builders' Journal.

Sir,—In answer to the above, may I thank "J. S. B." for pointing out the slip in my description. The joint moulds are projected from the elevation shown in dotted lines; and not from the development, as stated. They are projected on to a line parallel to the joint m′. l′. in elevation, and then swung round to the vertical line from o. (see angle between elevation and Fig 4): thus obtaining the same result as projecting directly from f′. g′. Joint moulds on e′. h′. have not been shown.

"J. S. B." is not quite correct in stating that the total height of the joint mould No. 2, Fig. 4, should be equal to the line *f.g.*, Fig. 3. It is equal to the length of the line f′. g′. in elevation (This, of course, is only approximate, as the joints are helical.) The long edges of the joint moulds are curved, and this I pointed out in my description (see Note 2). In the example shown it is sufficiently near to work to a straight line. The top of the check out, all along the arch, is a level plane; but, as the bed joints are inclined at different angles to the horizontal, the distance of the top of the check measured on the joint mould from some second level plane (*i.e.*, that containing the soffit of the keystone) is different for each joint. This is, perhaps, what "J. S. B." means when he says "the vertical height of the check on the joint mould would be greater than its vertical height taken at the centre line of arch"—a statement which is obviously incorrect.—Yours truly,

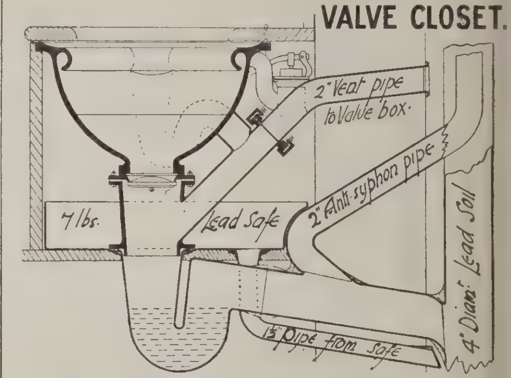
London. G. R. B.

R.I.B.A. Examinations.

To the Editor of The Builders' Journal.

Sir,— Referring to the reply to question 3, subject IV., on page 190 of the issue for October 17th, allow me to point out that a small error has crept in. There is no anti-syphon pipe shown, but what might be mistaken for same is the vent pipe to the valve box, usually carried through wall and finished with a wired end. The diagram below shows the correct construction.—Yours truly,

Chelsea. N. P.



Safe Load on Stone Column.

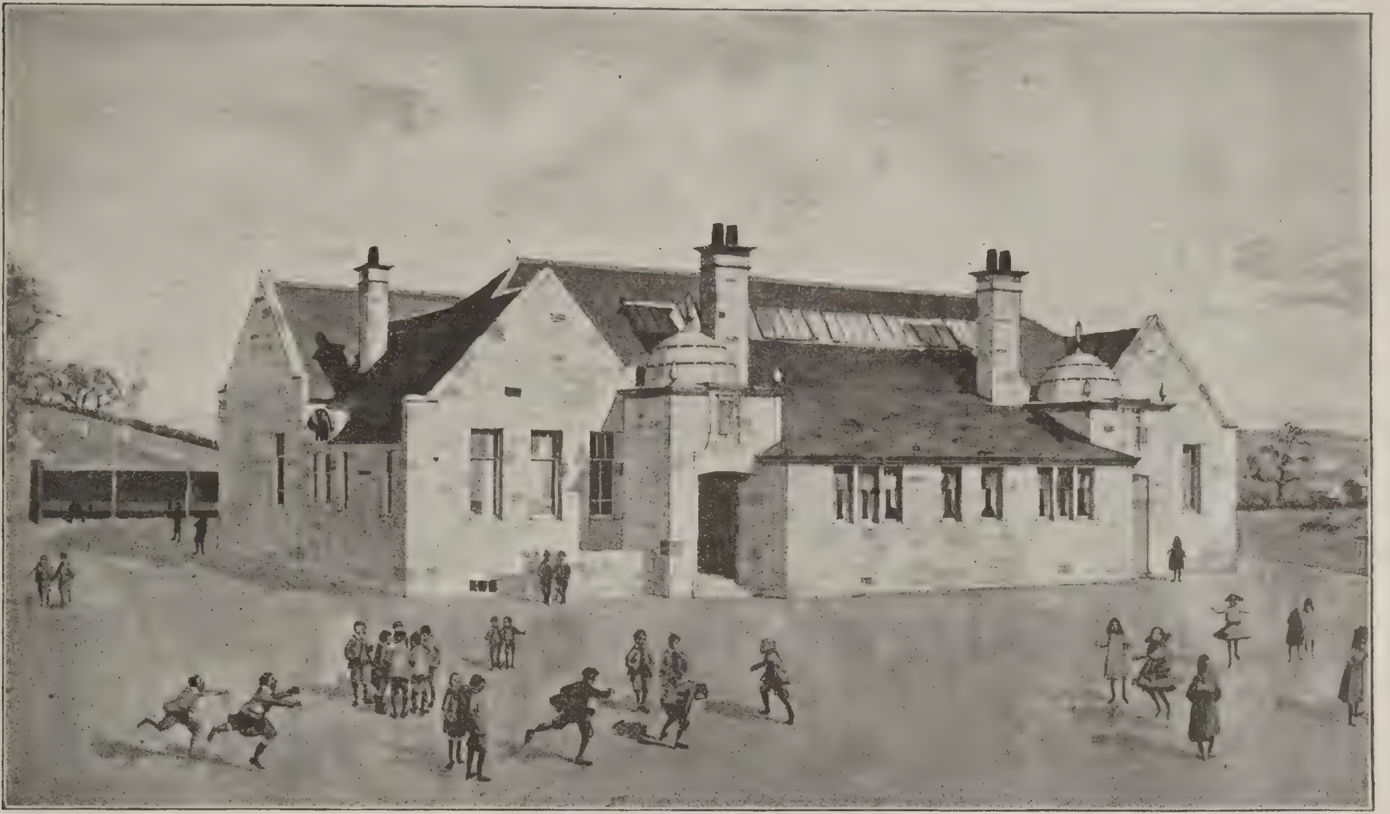
To the Editor of The Builders' Journal.

Sir,—I notice in the enquiry about "Safe Load on Stone Column," on p. 201 of your issue for last week, that "Pupil" states that the total weight of walls, &c., above an entrance porch, 14 tons, is supported by *one* Ham-Hill stone column. He appears to have overlooked the fact that there would be two columns in the *front part* of the porch, each taking an equal share of the weight, and the sides of the porch cornice or frieze would be resting either on two more columns, two three-quarter columns, or on the main wall, according to the design of the porch. There would, therefore, be four points bearing an equal share of this weight, and one column would, therefore, only be bearing ¼ of 14 tons, or 3 tons. The crushing weight of Ham-Hill stone is 207.5 tons per sq. ft.—Your truly,

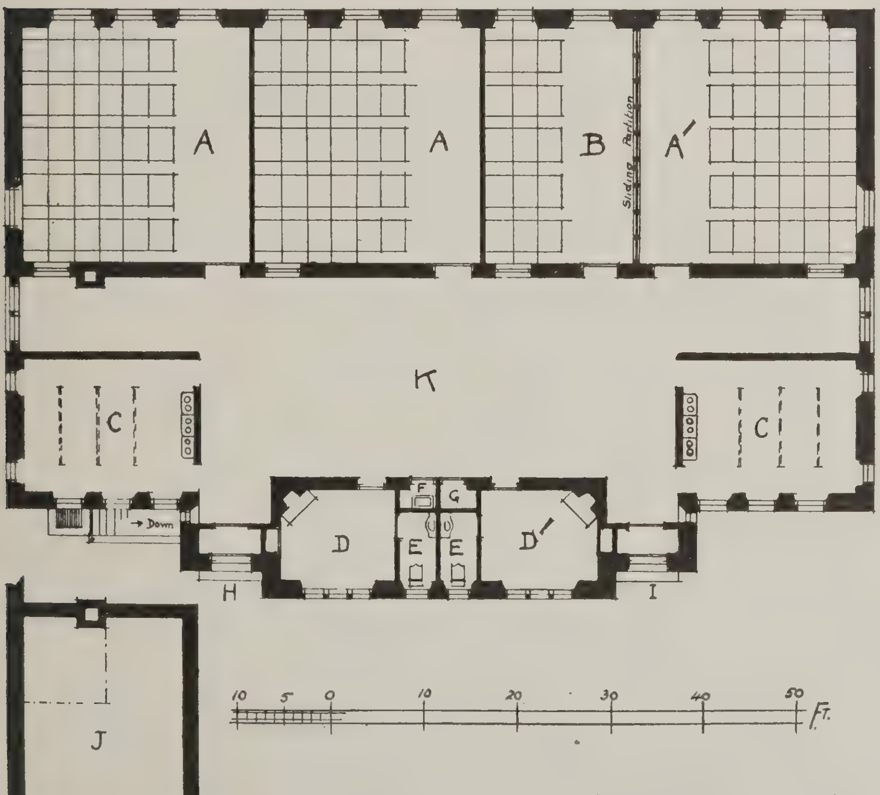
Yeovil. R. W. Staple.
Ham-Hill and Doulting Stone Co., Ltd.

Obituary

Mr. Walter Edwards, a well-known Chester architect, died last week, aged 59. For upwards of 40 years he was associated with the firm of Messrs. Douglas and Minshull, architects, Chester.



NEW SCHOOL, DRUMCHAPEL, DUMBARTONSHIRE. D. McNAUGHTAN, I.A., ARCHITECT.



A.A. classrooms for 60 scholars each, A′ classroom for infants, B, classroom for 30 scholars, C.C. cloak-rooms, D. headmaster's room, D′ teachers' room, E.E. w.c.'s, F. press with sink, G. press, H. boys' entrance, J. heating chamber, K. drill hall.

This school is an elementary one for boys and girls. The building is of white stone from Auchinlea quarry, and is slated with West Highland slates. The boys and girls have separate entrances which open into the central hall. This hall has a wooden floor of pitch-pine in 3-in. widths, nailed to Speedwell asphalt on concrete. The walls are lined with Carolina pine 4ft. high. The roof is of wood and is open to the ridge, with roof-lights of patent glazing. The woodwork of the roof is of pitch-pine, stained to an old oak tint and finished flat. The classrooms are well lit from the south-east. The ceilings are 13ft. high, and wood dadoes 4ft. high run round the walls. Adjoining the entrances are the two cloak-rooms, with cement floors and tiled dadoes. The headmaster's room and teachers' room are at the front. The passages at each end of the hall are for possible extensions. The building is heated by means of hot-water pipes from a boiler in the heating chamber under the boys' cloak-room. Radiators are placed in the classrooms in the window breasts, and fresh-air inlets are provided at the back of them. The architect is Mr. D. McNaughtan, I.A., of 137, West Regent Street, Glasgow.

Notes and News

A New Town Hall is to be built at Harwich at a cost of £6,000.

The Architectural Association Conversazione will be held on November 8th at 18, Tufton Street.

The Chancel of Govan Parish Church is to be lengthened from designs by Sir Rowand Anderson.

A New Cotton Mill.—Arrangements have been made for the erection of another cotton mill at Castleton, near Rochdale. It is to be called the Arrow.

A New London Concert Hall.—St. Paul's Church, Great Portland Street, London, is being demolished to make room for a new concert hall to be built on the site.

New Municipal Offices at Coventry, including a number of shops on the ground floor, are to be erected at a cost of £30,000.

At St. Matthew's Church, Willesden, the nave has now been completed, with narthex and western gallery, from designs by Mr. W. D. Caröe. The cost of the work has been £4,000.

Mr. Frank Brangwyn's new Fresco at the Royal Exchange was unveiled last week. It represents "Modern Commerce," forming a companion picture to "Ancient Commerce," by the late Lord Leighton.

An Oxfordshire Church.—The tower and belfry are being restored to Souldern Church, near Banbury, under the direction of Mr. G. F. Bodley, R.A., many of the old stones being re-used.

Scarisbrick Hall, Lancs—An interesting article on this building, by Mr. F. H. Cheetham, appears in the "Southport Visitor" for October 11th. Scarisbrick Hall is the work of Pugin, and its chief feature is the great banqueting hall, 45ft. by 30ft. by 80ft. high to the top of the lantern.

The New G.P.O. Buildings on the site of Christ's Hospital, Newgate Street, will be constructed on the Hennebique system of reinforced concrete. The architect is Sir Henry Tanner, principal architect to H.M. Office of Works.

Selby Abbey.—Mr. Oldrid Scott, architect to Selby Abbey, says the stonework in the nave is practically intact, but that of the north transept must be replaced, while the tower has been completely gutted by the fire.

Mr. T. Taliesin Rees, F.R.I.B.A., has been appointed architect to the Birkenhead Education Committee at a salary of £300 a year. The appointment does not debar Mr. Rees from carrying on his private practice at Liverpool.

A New Architectural Society.—A meeting of architects practising in Gloucester, Cheltenham and Stroud was held at Gloucester last week, Mr. F. W. Waller, F.R.I.B.A., in the chair, when it was decided to form a society representing the district.

The Memorial to the late Marquis of Salisbury erected in front of the entrance gates to Hatfield House represents Lord Salisbury seated in a chair and holding a scroll, and is set on a stone pedestal. Mr. George Frampton, R.A., was the sculptor.

A new L.C.C. Board School at Lewisham has been built by Messrs. Treasure and Son at a cost of £19,438 from designs by the council's (education) architect, Mr. T. J. Bailey. The school is in three departments and accommodates 1,200 children.

A Blackpool Scheme.—A scheme is under consideration by the Town Council of Blackpool for erecting a new building, to cost £40,000, over the present open market in the business centre of the town. A museum and art gallery would be provided.

An Institute and Reading Room has been erected at Llangefni, Anglesey. The architect was Mr. Richard Hall, of Bangor, and the contractors were Mr. T. P. Thomas, of Llanfair (for the general work), and Mr. Philip E. Jones, of Bangor (for sanitary and plumber's work).

A New General Post Office at Hanley has been erected from designs by Mr. John Rutherford, H.M. Office of Works. It is a well-proportioned stately building, for which we are profoundly thankful, recollecting the poor stuff which the Post Office Department has been wont to inflict on the provinces.

The Marble Arch Scheme prepared by Mr. F. W. Speaight, consisting in forming a large open space at the back of the Arch, with a crescent screen against Hyde Park, was adopted by the Marylebone Borough Council at their meeting on Friday last. The scheme is intended to relieve traffic, and is estimated to cost £25,000. In the opinion of the Council, the expense should be borne by county or national funds.

The Manchester Society of Architects is now in possession of its new home at St. Mary's Parsonage, which the Society has been enabled to acquire with the sum of money left by the late Mr. Alexander Mills, F.R.I.B.A., of Manchester. The first annual meeting of the students of this Society was held last week, when there was an exhibition of work done during the holidays. Mr. Roger Oldham took the chair.

The Ceiling of the Banqueting House in Whitehall, by Reubens, is to be restored. It has already been restored four times, once in the reign of George II., by Kent; in 1785 by Cipriani; in 1837 under the direction of Sir Robert Smirke (when the entire building was restored at a cost of £15,000 by Sir John Soane); and again at a later date in the nineteenth century.

A New Church at Sparkhill, Birmingham, is being erected from designs by Mr. Arthur Harrison, F.R.I.B.A. The contract has been let to Mr. Frank Davis, of Moseley, who is under an agreement to complete the work in about nine months. The church is estimated to cost £7,000, with seating accommodation for 705 worshippers, the main body of the building being 100ft. by 48ft.

Marischal College, Aberdeen, is not (Mr. Harry Hems points out) "the largest granite building in the world." Its total length is 400ft., width 60ft., average height 60 ft., and cost £200,000, while, by contrast, the new Pennsylvania State Capitol, also built of granite, is 520ft. long, average width more than 200ft., average height 100ft., and cost £2,600,000.

The National Trust.—At the last meeting of the executive committee it was announced that £580 was still needed to effect the purchase and repair of Barrington Court. It was decided to urge the preservation of the Ironmongers' Company's almshouses in Kingsland Road, Shoreditch, built in 1712. The sale of the site for building purposes is contemplated.

Proceedings of Allied Societies.—We have received the annual reports of the Liverpool Architectural Society and the Sheffield Society of Architects and Surveyors; also the Green Book of the Birmingham Architectural Association. The last-named is very well got up, and among the illustrations included in it is a very effective colour sketch of Caudebec by Mr. Arthur Harrison.

The Prince of Wales's Grate.—At Pond House, a block of new municipal dwellings at Chelsea, the grates used are the outcome of a suggestion made by the Prince of Wales, when, some time ago, he opened the Sir Thomas More Buildings at Beaufort Street, Chelsea. By means of sliding panels the heat from the kitchen grate can be diverted to the sitting-room when the family assemble there in the evening.

At Frisk House, Burnham, a new residence in course of erection by Mr. H. W. Polland (Mayor of Bridgewater), a complete electric lighting installation has been carried out by the well-known firm of Messrs. Duncan, Watson & Co., of Charing Cross Road, London, W.C., under the supervision of their engineer, Mr. A. W. Ashman. The installation is described as a model of country-house lighting.

"Isolated Homes for the Aged Poor v. the Workhouse."—The paper with this title which Mr. A. Saxon Snell, F.R.I.B.A., F.R.S.I., read at the recent congress of the Royal Sanitary Institute at Bristol has been issued in pamphlet form from the offices of the Institute, Parkes Museum, Margaret Street, W. Some plans are given of Mr. Snell's scheme of model homes, together with plans of married couples' quarters for the Holborn, St. Marylebone and Fulham Boroughs.

Hospital Wall Surfaces. — The best arrangement for the walls of hospital wards appears to be a good foundation of cement, with several coats over it of one of the enamel paints. The paint dries fairly quickly, and if properly put on upon a carefully-laid foundation of cement, it presents a perfectly even surface, as smooth as the surface of glazed tiles, and very nearly as smooth as that of the glass tiles.—"The Hospital."

Ingham Church struck by Lightning.—The stately tower of Ingham Church, Norfolk, was struck by lightning recently and greatly injured. At the north-west angle a lightning conductor was fixed some fifty years ago, and has proved to be a very inefficient safeguard, as the pinnacle adjoining it was struck, and although the upper portion remains, all the massive stonework, from its base to the upper string-course, has been torn away. The tower has been struck by lightning before.

The Paving of Whitehall.—The tender of the Improved Wood Paving Co., at 9s. 6d. per yd. super., was the next lowest to that of the Acme Flooring and Paving Co. In view of the defaults of this latter company in the paving of Whitehall, the Improved Wood Paving Co.'s tender has now been adopted by the Westminster City Council, subject to the company allowing the Council 1s. 7d. per yd. super. for the work already executed by the Acme Flooring and Paving Co.

A Block of Flats seven storeys high, to be called "Green Court," is to be erected on a site having a frontage of 225ft. to Shepherd's Bush Green. The building is to contain 156 self-contained residential flats of from three to five rooms each, and will be built in three sections. Messrs. Palgrave & Co. are the architects for this building, and also for a block of fifteen shops, called "The Market," about to be erected with a frontage of 254ft. to Turnham Green Terrace. For the latter, Messrs. R. Ward & Son are the contractors. The contract has been signed and the work is to proceed immediately.

Welbeck Abbey Glasshouses.—The Duke of Portland is having a considerable section of the glasshouses at Welbeck renewed and modernised. The new work includes: Span Corridor, 280 ft. by 16 ft.; three span plant houses, each 43 ft. by 20 ft.; six span houses, each 37 ft. by 12 ft.; span propagating house, 60 ft. by 12 ft.; also lean-to range, comprising three fig houses and two vineries, 300 ft. by 15 ft. The work of erecting the new houses has been entrusted to Messrs. Messenger and Co., Ltd., the well-known horticultural builders of Loughborough and London.

The Value of Adams' Patent Automatic Sewage Lift has long been realised in this country and abroad. This fact is borne out by the many important installations carried through by the sole manufacturers, Messrs. Adams-Hydraulics, Ltd., of York, &c., who have now in course of erection plants for the War Office, the Heywood Town Council, Messrs. Van Houten, Holland (the well-known chocolate manufacturers) and many others. Probably the most comprehensive scheme is that at Douglas, I.M., where the whole of the low-level sewage is raised by the high-level sewage without cost, an annual saving of between £600 and £700 thus being effected.

Enquiries Answered.

Dimensions of Greek Buildings.

Exeter.—Inter writes:—"What are the respective values of a module of the temples illustrated in Mr. Phené Spiers' 'Orders'? The scales given seem only to allow of them being worked out approximately. For instance, in the Choragic monument of Lysicrates the module scales 7.35ins. Pennethorne gives the base of the Lysicrates column as 13.52ins., which would fix the module at 6.76ins. Mitchell gives the Parthenon as 3.191ft."

It should be remembered that the dimensions of the various columns and parts of the Orders vary. Thus, the angle columns were usually stouter than the intermediate columns; also, the upward curvature of the stylobates and of the architraves of temples are different; hence the heights of the columns vary along the faces and flanks of the temples. The writers upon the Orders have apparently in some cases given dimensions which they consider to be typical, or else they show the dimensions of the angles of temples or of those columns which they have found in the most perfect state of preservation. Hence it is that the dimensions given by various authorities for the same example vary, but such variations only affect the second or third decimal part of an inch. With regard to Spiers' "Orders," it will be found that the dimensions he has given almost always agree with those given by Stuart and Revett in "The Antiquities of Athens." Stuart and Revett show, for the most part, particular columns with the corresponding parts of the entablatures accurately measured from the actual temples. If you have a mind for great accuracy, you should consult the above work (the large edition), Penrose's "Principles of Athenian Architecture," Inwood's "Erectheion," and similar works. In the case of the Choragic monument of Lysicrates, the dimensions of the external portion of the columns (which is larger than the internal portion) is given by Stuart and Revett as 1ft. 2ins., making the module .7in. For the accurate dimensions of every part of the Parthenon, consult "Principles of Athenian Architecture." To measure the examples given by Spiers to a greater degree of accuracy in feet, you might construct diagonal scales in hundredths from the plain scales of feet given. H. Y. M.

Dorset writes:—"What is the exact distance (in modules) between the columns in the Temple of Theseus, Athens? The intercolumniation of the two columns at the extremities of the peristyle is, of course, narrower than that of the others. What is the width of the end metopes, and are they the same size as all the others along the frieze?"

The Temple of Theseus has a hexastyle façade. The angle columns measure 3ft. 4.85ins. in diameter, and all the intermediate columns measure 3ft. 3.4ins. diameter. The inter-columns measure from the angle towards the centre 4ft. 6.35ins., 5ft. 4.05ins., and 5ft. 3.95ins. respectively. These dimensions are similar on both sides of the centre. The dimensions are here given in feet, as the columns vary in diameter, so that the figures representing the spacing of the columns will vary according to which diameter you take to give the module. The angle triglyph measures 1ft. 8.3ins. across, and the first metope from the angle measures 2ft. 6.475ins. across. The intermediate triglyphs are practically of the same dimensions as the angle triglyph, and the triglyphs are spaced centrally over the columns, thus fixing the size of the intermediate metopes.

H. Y. M.

Account Books for Brick and Tile Works.

I. W. writes: "Do you know of any firm which makes a speciality of account books for brick, tile and pottery works? A company in which I am interested requires a set of books and would be glad to have a special system."

We do not know of any such account books. Possibly some reader may be able to furnish the desired information.

Building Stone near Tavistock.

Plymouth. A. W. P. writes: "Which is the most suitable stone for general walling purposes to be found in the neighbourhood of Tavistock? Is it suitable for churches in rural districts? What freestone would be most suitable to use for window dressings, tracery, &c., in first-class work in the above district?"

The only quarry of any importance in this part of England is Pomphlet, near Plymouth, which supplies a limestone for general building purposes in blocks up to 100 tons, having a crushing resistance per foot super. of 58 tons and a weight of 168 lbs. per ft. cube. This stone is also used for the manufacture of building lime. It is quite suitable for churches in rural districts, and can be used for window dressings, tracery, etc. The Royal Oak granite quarries are situated near Tavistock. H. Y. M.

TWO GREAT BUILDINGS AT CARDIFF.

Monday's opening of the new City Hall and Law Courts which have been erected in Cathays Park, Cardiff, marks the completion of a great undertaking. It very rarely happens in this country that architects have at their disposal such splendid sites as that at Cardiff, and it is all the more gratifying, therefore, to see what excellent use Messrs. Lanchester and Rickards have made of their opportunity. The buildings are worthy to rank among the best examples of modern English architecture—more especially the Council Chamber, with its finely-proportioned dome, and the magnificent sculpture decorating it. We do not know of any recent building where sculpture and architecture are combined to better effect, and we think this is all the more satisfactory when we remember that at Cardiff this sculpture work has not been done by Royal Academicians or other men who usually secure the big opportunities, but by a band of younger and less-known men. Their work is of great ability and in perfect accord with the architecture, which result must be attributed to the close collaboration between architects and sculptors. In the interior of the building the enrichment and decoration is sparingly applied, and in every case kept within the architectural lines. The undertaking has been in progress for several years and has involved an expenditure (including site) of nearly half a million of money. So fine a piece of work is worthy of being put on adequate record. "The Architectural Review" recognises this, for in its November issue will be given a series of 35 interior and exterior photographs of these two notable buildings.

AN ADDRESS TO GLASGOW STUDENTS.

Mr. James Miller, A.R.S.A., F.R.I.B.A., delivered an address to the Architectural Craftsmen's Society at the Glasgow Technical College on October 19th. After pointing out that the architect's drawings were only means to an end, and that the success of the work was largely dependent on the ability of the craftsmen who carried it out, Mr. Miller went on to emphasise the importance of "efficiency"—in scheme, planning and construction. This demand for efficiency was equally on the craftsman as on the architect. We frequently heard of the professions and trades being overcrowded, but with what? Was the architectural profession overcrowded with able and capable draughtsmen? Were the trades overcrowded with efficient tradesmen? He hardly thought so. There was, indeed, a decided lack of good and capable men, both in the professions and the trades. In this respect an institution such as theirs was a great boon, because it trained men to become capable members of their craft. No doubt many of those he was addressing intended later in life to become clerks of works, or to start business for themselves. Now,

the position of the clerk of works

was a most important one, and it certainly was not overcrowded with efficient men. In a building of any magnitude there were many points which, as the work proceeded, might be altered or modified with beneficial results, and it should be the duty and ambition of the clerk of works to look out for these points and report his ideas to the architect. It might be urged that the architect's drawings ought to be perfected before they left his hands, but in answer to that Mr. Miller said there was no such thing as perfection in planning or design, and it was a great mistake to imagine that because the plans were prepared and matured it was too late to make an alteration—not radical rearrangements, of course, which ought not to be necessary, but minor alterations in detail, which might be found desirable as the building grew.

Mr. Miller then went on to particularise on the necessary and desirable qualifications of a clerk of works—knowledge of materials, capacity of looking ahead, ability to lay down details and extend plans, close inspection and supervision, &c. With regard to this last, however, no amount of care and watchfulness on the part of the clerk of works would guarantee good workmanship; this could only be assured by the employment of capable craftsmen who understood their work and did it conscientiously. Industry was the great thing. As Sir Joshua Reynolds had said, "You must have no dependence on your own genius. If you have great talents, industry will improve them. If you have moderate abilities, industry will supply their deficiency. Nothing is denied to well-directed labour. Nothing is to be obtained without it."

The profession of architecture

was next dealt with by Mr. Miller. Let no student think it was an easy career. The work of an architect was interesting, fascinating, but before attaining success he had to make up his mind to put in a great deal of hard work, and suffer many disappointments. Nevertheless, he might enter upon his task with good cheer, provided he had a natural aptitude for the work. This was essential. Many students, unfortunately, were lured into the circle of architecture by considerations other than fitness or aptitude, with the result that failure usually followed.

In his studies the student would find it necessary to consider modern architecture in a different manner to the architecture of past ages. In the past the architect and craftsman studied and worked side by side, the work of the one merging into that of the other; the individualism of modern work was entirely absent in the work of the Middle Ages. The advancement of science and engineering had led to the specialising of work of all kinds, and the function of the modern architect had become more one requiring him to direct and guide than to take any practical part in the work himself.

The architectural student should make himself thoroughly familiar with the best work of past ages, and he should also study the best current work, for power of invention and originality of conception would be in proportion to one's knowledge of the work of those who had excelled.

This knowledge of old and new work could best be obtained by studying actual buildings, and by sketching and measuring them—not trusting to memory, but jotting down memorising sketches of anything that was worth noting. In this particular Mr. Miller said he had been greatly struck recently by the method followed by a London firm of designers. This firm, in addition to a good library, had a large cabinet of drawers filled with sketches, photographs and cuttings of illustrations of all kinds of ornament from multitudinous sources, all classified into styles, and subdivided into groups—such as carved panels and mouldings, caps and pilasters, &c., the whole system most complete and painstaking and one to be strongly recommended.

Students should not be carried away with the idea that one must always be original, producing something altogether new. "By all means be original if you wish, if your originality is to be as good, or better, than anything that has been done before, but make sure that it is so before you attempt it."

Replying to a vote of thanks, Mr. Miller referred to the manner in which the work of the Architectural Section of the College was carried on under the guidance of Prof. Gourlay. The architects of Glasgow were indebted to Prof. Gourlay for the earnest and thorough way in which he conducted the work.

VIRGINIA CREEPER ON ANCIENT BUILDINGS.

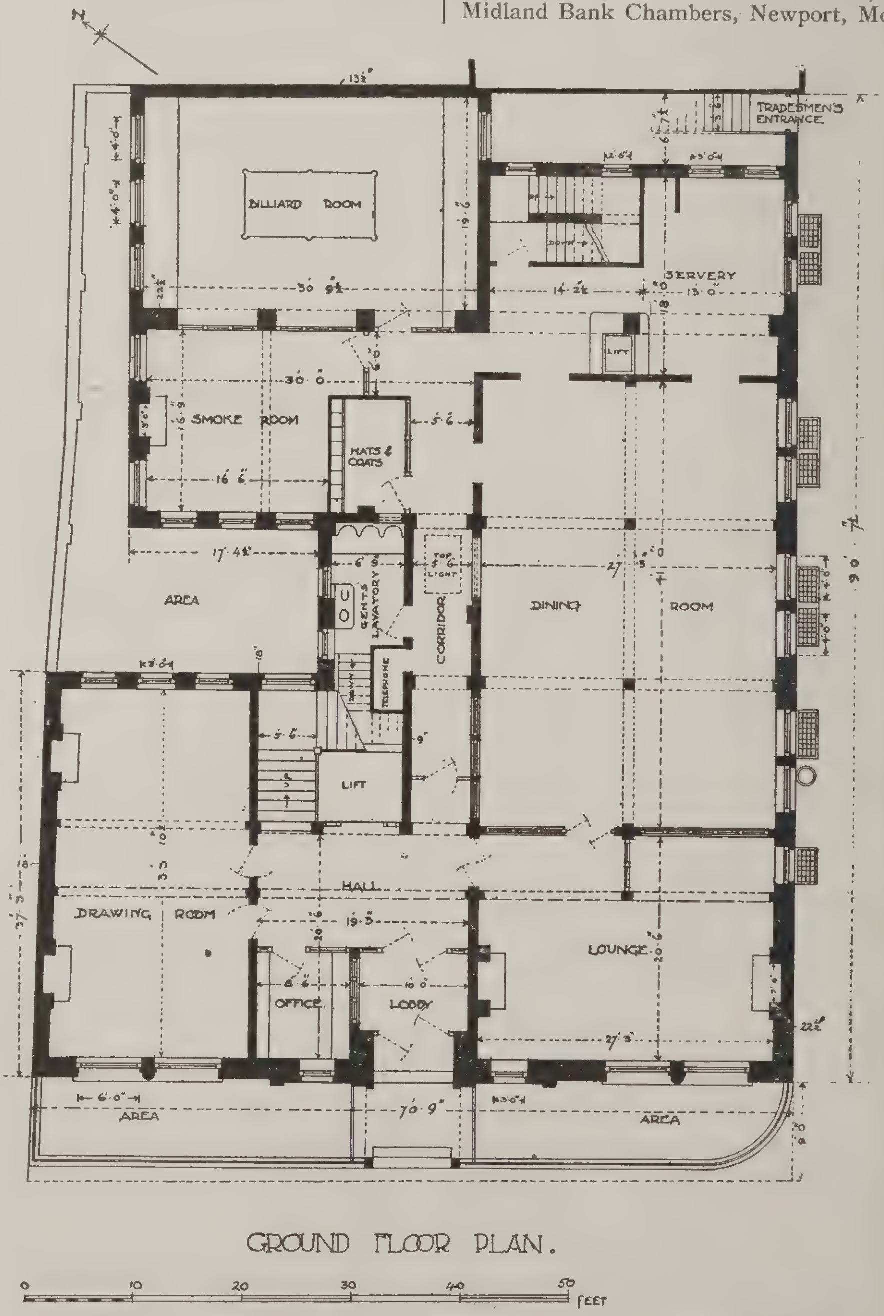
"F. S. A.," in a letter to the "Times," says that when visiting Oxford and Cambridge recently he was "much concerned to see how in both places the college buildings are being overwhelmed with Virginia creeper. This may afford pleasure to the casual sightseer, especially at this time of the year, when the colour is vivid; but to all who have any knowledge or love of architecture it is a condition of things greatly to be deplored. Interesting bits of detail and features which may furnish valuable clues to the student of architecture are gradually disappearing, and the history of the buildings, so far as it can be read in their stones, bids fair to become shrouded in impenetrable mystery. To mention a few instances at Oxford, the east window of the chapel at Oriel, where the tracery is a curious example of early 17th century treatment, is almost submerged; the quaint twisted columns of the porch of St. Mary's Church are hardly visible; and the late 17th century chapel at Trinity is so completely overgrown that its windows are merely irregular orifices in the foliage, and the cornice is only to be detected by the band of blurred shadow which its projection causes. . . At Cambridge the mischief is, perhaps, not yet quite as bad as at Oxford; but with so vigorous a grower as the plant in question it is only the matter of a year or two for both places to be in the same evil plight."

In reference to the foregoing, Mr. H. E. D. Blackiston points out that the statements are only half true as regards the 17th century chapel of Trinity College, Oxford. "The south front is thickly covered with Ampelopsis, which has not been very recently trimmed. It is beautiful and also useful as retarding the erosion of the soft and flaky Headington stone. The north side of the chapel, within the quadrangle, is, of course, architecturally identical with the south side; it is less exposed to the weather, and there is not a vestige of any creeper on it."

"Orielensis" observes that "F. S. A." in describing the east window of the chapel at Oriel as "a curious example of early 17th century treatment," pays a compliment to Mr. T. G. Jackson, from whose design it was erected in 1885.

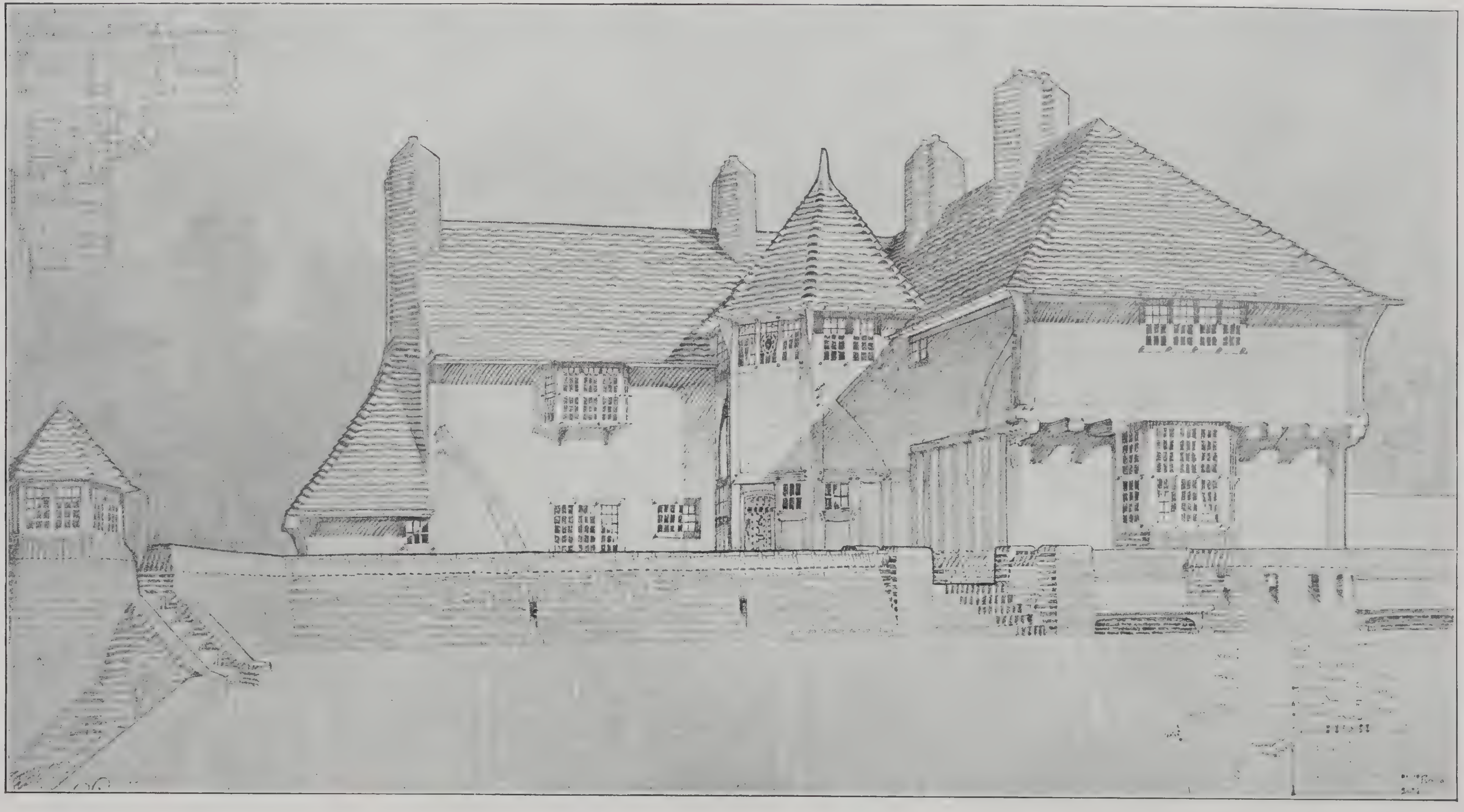
HOTEL GWALIA, LONDON.

This hotel is to be erected in Upper Woburn Place, a part of London which is rapidly becoming a centre for hotels. The thoroughfare is in direct line with the newly-opened Kingsway. The Hotel Gwalia will be equipped in the most modern style, and will contain 100 bedrooms. The site has a good area. The floors throughout will be of fireproof construction. The facings of ground and first floors, as well as dressings generally, will be in Portland stone, with cherry-red brick facings above; while the Mansard slope will be laid with Westmorland green slates. Some of the directors of the well-known Gwalia Hotel at Llandrindod Wells are interested, and will be closely identified with the new company. The architect is Mr. Alfred Swash, of Midland Bank Chambers, Newport, Mon.



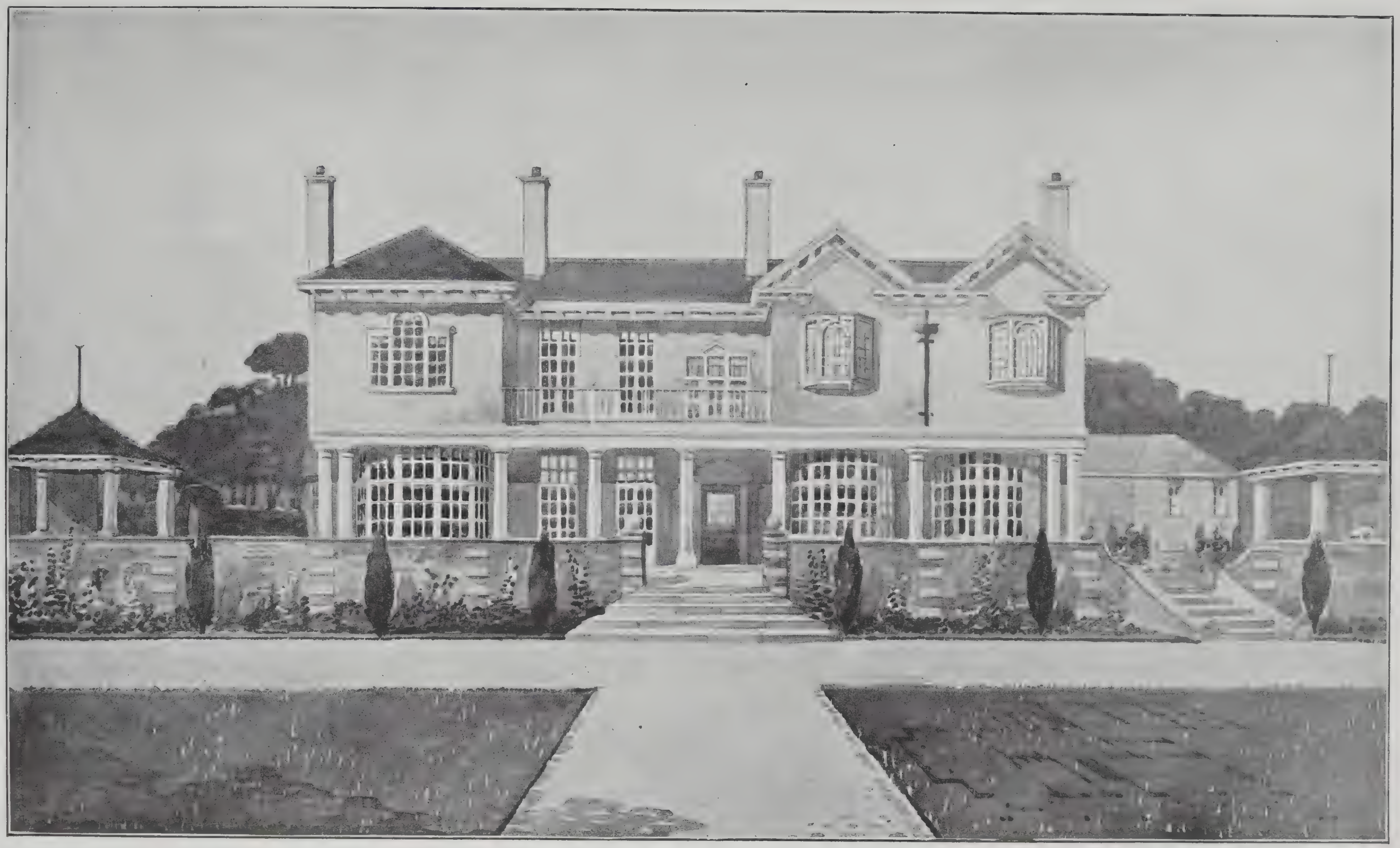
HOTEL GWALIA, UPPER WOBURN PLACE, LONDON, W.C. ALFRED SWASH, ARCHITECT.

LIBRARY
OF THE
UNIVERSITY OF ILLINOIS

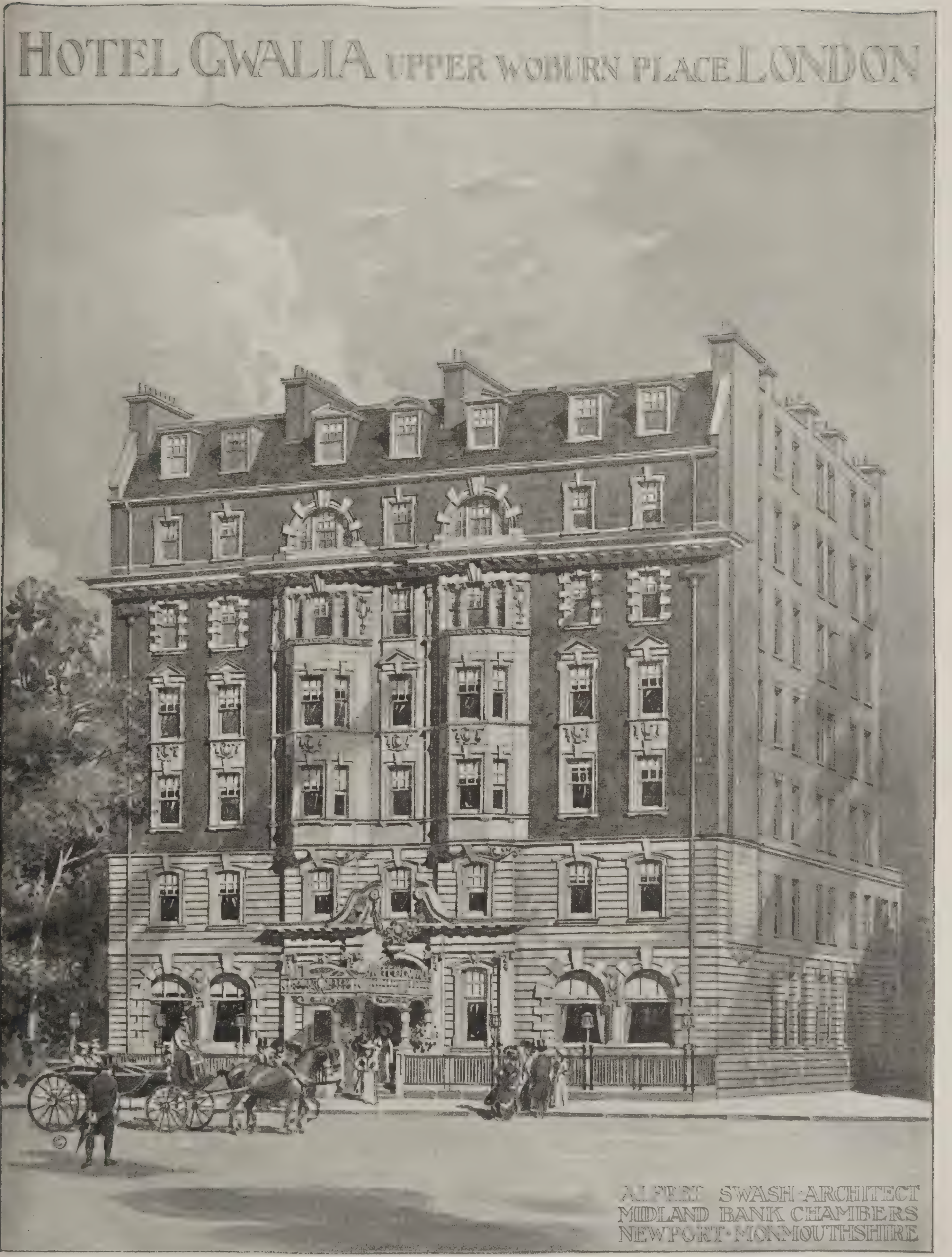


"WOODCOTE," CAMBERLEY, SURREY. H. R. AND B. A. POULTER, ARCHITECTS.

Supplement to
The Builders' Journal and Architectural Engineer,
Wednesday, October 31st, 1906.



PROPOSED HOUSE NEAR LEATHERHEAD, SURREY. LIONEL G. DETMAR, A.R.I.B.A., ARCHITECT.


HOTEL GWALIA UPPER WOBURN PLACE LONDON
ALFRED SWASH ARCHITECT
MIDLAND BANK CHAMBERS
NEWPORT MONMOUTHSHIRE

Views and Reviews.

A Good Book of Country Cottages.

With the great interest displayed in small houses during the last few years—an interest quickened by the holding of cottage exhibitions in several parts of the country—numerous books on the subject have made their appearance. Many of these books, however, have been lacking in architectural interest by reason of the fact that they have not been compiled by persons familiar with the trend of thought and design among the best architects of the day. With the book now before us, however, the case is different, for Mr. J. H. Elder-Duncan, in his capacity of Editorial Secretary to the *Architectural Review*, has been kept in touch with the best modern work. Architects and the public, therefore, are very much indebted to him for bringing together such a collection of well-designed houses as given in this book, and it is gratifying to see that in very nearly all instances the houses are shown by photographs of the completed work, and accompanied by plans. The bulk of the book is made up of this collection of illustrations, excellently printed, and with notes on each of the houses shown. In addition, there are several chapters dealing with general matters of design and construction, such as the question of the site, water supply, lighting, planning, decoration, lay-out of gardens, &c.

As there are more than 100 houses included in the book, ranging in cost from £175 to £3,500, it is quite impossible for us to attempt any list of them, but we would mention, as indicating the quality of the work included, that photographs are given of houses by Messrs. Brewill and Baily, Buckland and Farmer, Horace Field, T. Phillips Figgis, Ernest Gimson, A. J. Hardwick, P. Morley Horder, Percy B. Houfton, H. G. Ibberson, Mervyn Macartney, C. E. Mallows, Ernest Newton, Nicholson and Corlette, Niven, Wigglesworth and Falkner, H. L. North, Godfrey Pinkerton, H. R. and B. A. Poulter, C. H. B. Quennell, John W. Rhodes, Halsey Ricardo, R. Weir Schultz, M. H. Baillie Scott, Charles Spooner, C. F. A. Voysey, Edward Warren, William H. White, A. Needham Wilson, Edgar Wood and other well-known architects.

Altogether the book is one we can strongly recommend.

"Country Cottages and Week-end Homes," by J. H. Elder-Duncan. London: Cassell & Co., Ltd., price 5s nett.

The Cathedrals of England and Wales.

With the appearance of the third volume comes the opportunity of reviewing this work as a whole. The author found time while he had it in hand to add another desirable work to this series—the "Cathedrals of Northern Germany," and his very extensive knowledge of the cathedrals of other countries has been of great service here. There are numberless guides to our cathedrals which would be bad indeed if not rendered desirable by the introduction of some special feature, and in this particular case the lack of tabulated information, and illustrations of any value, is atoned for in great measure by the writer's extensive knowledge, and by his generous appreciation of quality in architectural work, irrespective of style or period. Assuming, as he does, more knowledge of building than the reader has as a rule, it follows that the worth of Mr. Bumpus's volumes is more likely to be understood by those who already know a good deal than by the millions of guide-book buyers for whom such things are produced. Too big for the pocket, they are designed for the library and for the longer life that the more fortunate have. Peculiar to these volumes is the amount of information vouchsafed about the music-makers of the cathedrals. Peculiar, also, and less happily introduced, are the anecdotes with which they are padded. These seem out of keeping with the austerity of the buildings to which they relate, and the space which is occupied by them might as well have been filled by the plans which are lacking here, or by a more satisfactory index.

"The Cathedrals of England and Wales," Vols. I., II. and III., by T. Francis Bumpus. London: T. Werner Laurie, 13 Clifford's Inn, price 6s. nett each volume.

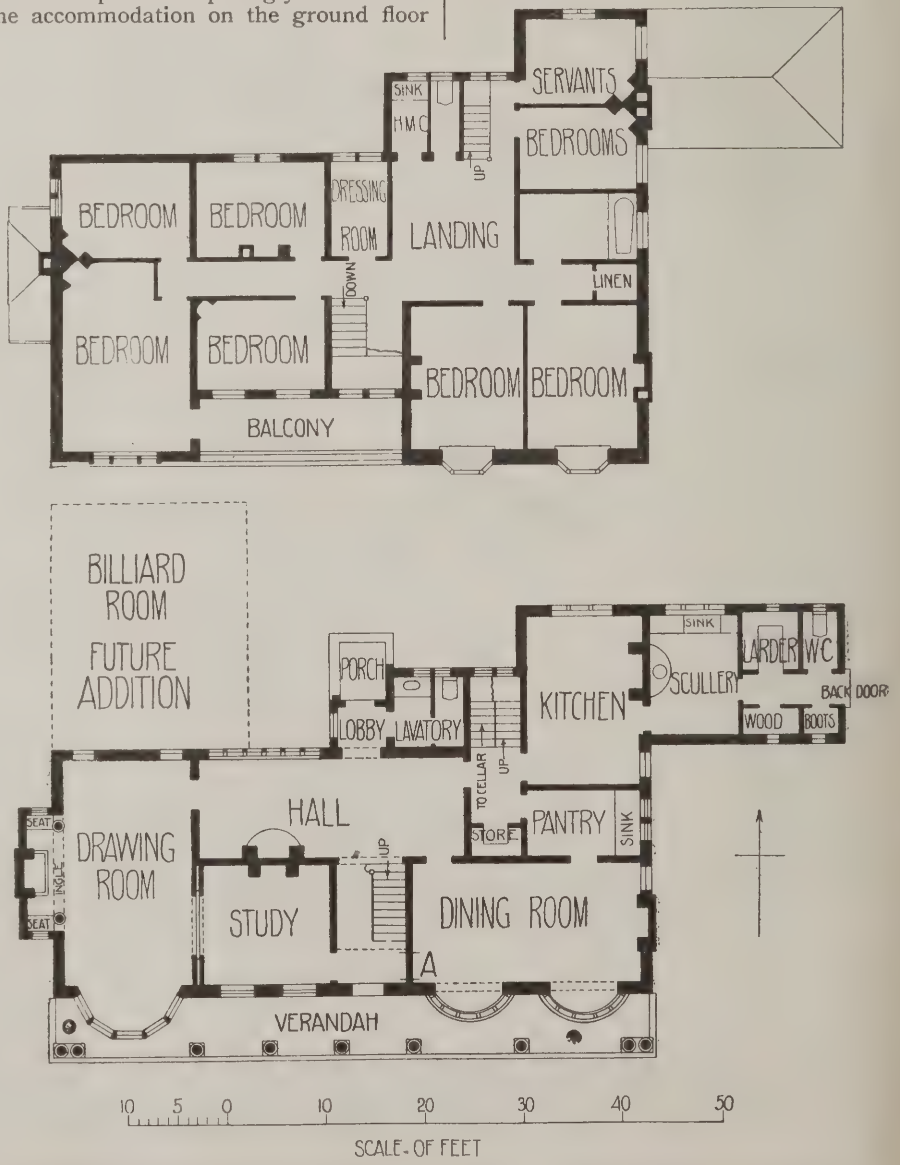
Our Plates

"Woodcote," Camberley.

This house is situated on a gravel hill. The walls are of oak timber framing left rough, filled with Taylor's bricks, which are cement rough-cast and whitewashed. The roofs are covered with old tiles from barns at Frimley. Internally the walls are finished in white plaster, with oak joinery throughout, and heavy oak ceilings. For the glazing $\frac{3}{8}$in. leads are used, with decorative portions sparingly introduced. The accommodation on the ground floor is shown by the plan on the illustration; the first floor comprises three bedrooms, with dressing-room and bath-room, night and day nurseries; the attic two bedrooms and box-room; with a cellar in the basement. The complete cost of the house worked out under 7$\frac{3}{4}$d. per foot cube. Mr. W. H. Tarrant, of Frimley, was the builder, and Messrs. H. R. and B. A. Poulter, of Camberley, were the architects.

Proposed House near Leatherhead.

This house has been designed for a site on the Pachesham Park Estate, Leatherhead. The chief rooms have a southern aspect and open on to a verandah, extending along the whole south front, with a small balcony over the centre portion. The plan is so arranged that by shutting a door from the hall the whole of the kitchen wing can be completely cut off by a ventilated lobby, containing servants' staircase; service being through the pantry. The provision of an additional door to the dining-room at the point marked "A" will enable guests on special occasions to circulate through the entire ground floor suite. Red facing bricks are intended for the ground floor, with rough-cast above; roofs of green Westmorland slates; and all external woodwork of deal, painted white. The estimated cost is £2,500. The architect is Mr. Lionel G. Detmar, A.R.I.B.A., of 1a, St. Helen's Place, E.C.



PROPOSED HOUSE NEAR LEATHERHEAD. LIONEL G. DETMAR, A.R.I.B.A., ARCHITECT.

ICONOCLASTS AT EXETER CATHEDRAL.

The west front of Exeter Cathedral is the subject of an animated correspondence in the columns of the "Times." Mr. Thackeray Turner, secretary of the Society for the Protection of Ancient Buildings, says: "A short time ago the stonework of the large west window was rebuilt, and now the canopied work is being renewed. Before the work was begun my Society asked the Dean and Chapter whether they intended to publish any report or statement upon the condition of the west front and what was proposed to be done to it. A reply was received to the effect that the Dean and Chapter, having taken the advice of a competent authority, declined to share their responsibility with any irresponsible authority. The Society publicly called attention to the value of the west front and of the danger which threatened it; and although the Society was aware, at a later date, that the iconoclasts were at work, it took no further action, knowing that any remonstrance with the Dean and Chapter would be useless. . . . The most recent work done to the front is the complete renewal of a series of three or four canopies and a length of the cornice on the south division of the front. The shock of this work is almost more disturbing than any example of 'restoration' I have ever seen. . . . The canopied work is so weathered that to put a fixed form as definite as a piece of machinery on this faded lacework requires great hardihood, and that is what it has got. The great window, as you know, is now new, the upper gable is new, some of the raking arcade is new, pinnacles new. About half the front (except the images) is now new. Only a few years ago it seemed an ancient front. It looks strangely small and foolish now. . . . It is quite certain that the medieval art treasures of England cannot be of modern carved stonework, and it is time to ask whether a modern cathedral or an ancient one is required. We believe, although we are not certain, that the evil deed cannot, as usually is the case, be thrown on to the shoulders of an eminent ecclesiastical architect. Of course, the real difficulty has been and is the surface decay of stone. In the opinion of this Society, the application of lime and baryta meets this difficulty satisfactorily."

The Dean's Reply.

Replying to the above, the Dean of Exeter says: ". . . Upon examination this magnificent window [the great west window] was found to be in a perilously ruinous condition, partly from the ravages of time, exposure to weather, and natural decay, partly from the rude treatment which it had undergone when Peckitt's glass was put in about 1770; a broad and deep second glass line had been cut, greatly weakening the stonework. If left to itself the whole window would in a short time have fallen in; its condition was very serious. The work was undertaken after grave deliberation and under the best advice, and not one single inch of old work that was capable of preservation was not preserved, and not one inch of unnecessary new stonework was inserted—the result being that we have preserved with the most jealous care this magnificent window from becoming a complete ruin without having altered a single feature. . . . Mr. Turner would prefer a ruin from which all traces of the past shall have crumbled away and nothing but dust and featureless disfigurement remain. Our duty is not to provide an interesting ruin for Mr. Turner's Society, but so to arrest decay and prevent ruin as to leave behind us a glorious building which shall be in its unmutilated beauty at once a faithful witness of the architecture of the past, and the sanctuary in all its surroundings fit for the service of Christian men."

To a representative of the "Devon and Exeter Gazette" the Dean said: "The Cathedral architect (Mr. Harbottle) is now allowed an unfettered hand. Some members of the Chapter invariably inspect those portions of the building which are reported to require renewal. And, in these cases, as in the west window, every scrap of old material which can be retained is sacredly kept in place. Where new work is inserted the details of the old work are faithfully reproduced, and the most reverential care displayed in continuing the ancient features. It is impossible to make practical use of preservatives. The decay is of more than superficial depth, and, so far as the old work is concerned, it is felt that the application of lime and baryta, as suggested, would be ineffective. It is better to have faithful reproductions in new stone than a mere heap of black dust or a few broken walls of stone. That is the policy of the Dean and Chapter, and it has the warm support of the well-known ecclesiastical architect, Mr. Bodley, and the citizens of Exeter."

Returning to the charge, Mr. Thackeray Turner says: ". . . I am quite sure that if the Dean had seen the stonework in the chapter-house at Westminster Abbey, which Prof. Church succeeded in preserving, and which crumbled at a touch of the hand, he would have said it could not be saved. . . . And it is impossible that the Dean can have failed to see the ancient town-hall of Exeter and to know that it was repaired by the Society. Can he say that we have left it a ruin? The Dean says he wishes to leave behind . . . a glorious building which shall be in its unmutilated beauty at once a faithful witness of the architecture of the past. To attain this object he is destroying, instead of preserving, the actual work of the ancient builders, and substituting modern conjectural work; and I will defy anyone to honestly say that the partially new west front of Exeter Cathedral is an unmutilated and faithful witness of the architecture of the past."

For the Restorers.

On behalf of the restorers Mr. Alfred Marlborough enter the lists. He says: "More than half of the repaired west window is old work, there has been no 'modernisation'—these are matters of fact, not opinions. The decayed work at Westminster was 'in' the chapter-house, our decayed work is exposed to Dartmoor and Atlantic storms outside on the most exposed portions of the western front. I believe that the decay at Westminster was comparatively superficial and did not endanger surrounding portions of the fabric, and was not dangerous to passers-by. At Exeter the decay is deep-seated, does affect the surrounding masonry, is dangerous to passers-by. The conditions are very different. Washing with baryta does not strengthen the stone structurally, it forms a scab of the decayed stone on the face of the sound stone, which, as is the case with all scabs, has a tendency to peel off. Treatment which may be useful 'in' the chapter-house at Westminster would not do for our exposed west front.

"Local opinion as to Exeter Guildhall is very divided. I believe that it was scraped and washed; but here, again, the conditions of the two are very different. The one is a late Tudor building, which may or may not lend itself to scraping and washing, but this treatment would not suit the elaborate details of the west front, where the far more ancient work is in a far more decayed and dangerous condition. As to the work in progress, it is rather slap-dash criticism to write that any 12 alternative forms might be set up as equally 'correct'; such is not the opinion of those who are minutely and accurately acquainted with the old work, and are reasonably sure that the work in progress is in accordance with the old. Of course, it looks new, harsh, raw in contrast with the old; but it will in time tone down. The contrast is, of necessity, severe at present. As to the appearance of the old figures under their new canopies, would they have looked better if their canopies had been permitted to fall on them, breaking off a head here, an arm there, and leaving them exposed, uncanopied? It is not iconoclastic savagery, it is the tenderest sympathy for all that is venerable that moves us in what we are doing . . ."

A Note from Professor Church.

In a further letter, in the "Times" for Monday, Mr. Thackeray Turner, referring to the above statement that Prof. Church only formed a scab on the stone at Westminster Abbey, gives the following note from Prof. Church:—"The Dean of Exeter is obviously unacquainted with the nature and effects of the baryta treatment of decayed stone. Contrary to his assertions and suppositions, the decay at Westminster was not superficial but deep-seated; the baryta strengthens the stone structurally; it does not form a 'scab' and there is no tendency to peel off." Mr. Turner denies that his Society scraped Exeter Guildhall. "How could the Society do such a thing when its short name is Anti-scrape? . . . The Dean says that his new work looks 'new, harsh, raw,' and yet he would have us be satisfied with it. We are not. Great advances have been made in recent years in the methods of preserving ancient work; and I will give as an example West Ham Church tower, which, in my opinion, was in quite as bad a state as Exeter west front. It has been put into substantial repair and does not look 'new, harsh, raw,' any more than does Exeter Guildhall . . . ."

Chillon "Restored."

While dealing with this matter of restoration at Exeter it is interesting to note that Mr. Isidore Spielmann, F.S.A., the well-known art critic, asserts that the Castle of Chillon, on the Lake of Geneva, is being "restored to death." The interiors of many of the rooms have been "decorated," and structural alterations and "improvements" are in active progress. The safety of the building is in no way involved, and, with the sole object of embellishment, the windows are being enlarged and replaced by Gothic windows of a highly decorative character!

Notes on Competitions

List of Competitions Open.

Deposit for conditions given where known.

DATE OF DELIVERY	COMPETITION.
Nov. 30	LIBRARY AT NEWTON-IN-MAKERFIELD.—Cost £4,000. Particulars from C. Cole, clerk to U.D.C., Town Hall, Earlestown, Lancs. No deposit.
Dec. 12	LAY-OUT OF RIDDRIE ESTATE, GLASGOW.—Premiums of £75, £50 and £25. Particulars from A. W. Myles, town clerk, City Chambers, Glasgow. No deposit.
Dec. 31	DUAL SECONDARY SCHOOL AT GOOLE.—Premiums £50 and £25. Particulars from James W. Johnson, clerk to Governors, Council Offices, Goole. Deposit £2 2s.
Dec. 31	NURSES' HOME AT GENERAL HOSPITAL, WOLVERHAMPTON.—Particulars from J. Stephen Neil, House Governor and Secretary, General Hospital, Wolverhampton. No deposit.
Dec. 31	BATHS AT ASHTON-IN-MAKERFIELD.—Limited to architects in Wigan and Leigh Poor Law Unions. Particulars from A. Sykes, clerk, Council Offices, Ashton-in-Makerfield. No deposit.
1907 Jan. 19	LIBRARY AT PLYMOUTH.—Premiums £50, £30 and £20. MUSEUM AND ART GALLERY AT PLYMOUTH. Premiums £25, £20 and £10. Limited to local architects. Particulars from Borough Librarian, Plymouth
Feb. 1	CHILDREN'S HOSPITAL AT SUNDERLAND.—Premiums of £100, £50 and £25. Particulars from T. Robinson, secretary, Infirmary Offices, Bank Buildings, Sunderland. Deposit £1 1s.
No date.	ALTERATIONS TO UNION AND VESTRY OFFICES IN WESTBAR, SHEFFIELD. Limited to Sheffield architects. Premiums £25, £15 and £10. Particulars from A. E. Booker, clerk to Guardians, Union Offices, Westbar, Sheffield.
No date.	BRANCH LIBRARY AT DUNFERMLINE. Particulars from Secretary, Carnegie Dunfermline Trust, St. Margaret's, Hull, Dunfermline.

Children's Hospital, Sunderland.

The objectionable practice of requiring a deposit for conditions has been adopted in this competition and is being applied in its most obnoxious form. This consists in the refusal of the promoters to allow any applicant to have a set of conditions on approval, so that an intending competitor must risk a guinea before he can ascertain whether the competition is one in which he would care to engage. One architect sent a cheque with his application and stipulated that it should be returned to him if he, on his part, returned the conditions within three days. He received his cheque back without delay and is now looking out for a friend who may be the richer by a set of conditions and the poorer by a guinea. This arbitrariness and the meanness which refuses the loan of a few sheets of printed paper are in evidence all through the conditions. To commence with, a hospital for 60 patients is required at a cost of £16,000. This sum is to include boundary walls, commission to architect and to quantity surveyor and the clerk of works' salary. The accommodation is to include three wards containing 20 beds each, an operating theatre, a dispensary, an out-patients' and casuals' department, a general administration block of three floors, a laundry, a mortuary, a post-mortem room, &c., and numerous accessories. Hospitals have been built for small sums, but here is one which will tax the energies of the most economical planner and frugal specifier. Under such conditions it will not be astonishing if discrepancies occur between the estimates of architect and contractor. The promoters appear to have foreseen this, for they have, with an iron hand, inscribed a clause regardless of custom and devoid of mercy. This provides for the right of the Committee to reject any design if, upon the quantities being taken out, the tenders by contractors based upon such quantities should exceed the architect's original estimate. The right is also reserved to cancel any agreement which may have been entered into with the architect. In this case the architect shall have no claim against the Committee beyond the premium awarded to him under the conditions. There is no margin of safety whereby the contractor's price may exceed the architect's by a certain percentage. In another arbitrary clause the Committee hold themselves at liberty to reject the whole or any of the designs if they should appear to be unsuitable or of too expensive a character. The culminating point is reached with clause 20, where it is stated that "the selection of designs and the award of premiums in respect thereof shall not give any competitor, who succeeds in such selection in obtaining a premium, any right or claim to be entrusted with or appointed as architect for the carrying out of the work, or to any remuneration whatever other than the premium so awarded." The premiums, it should be mentioned, are £100, £50 and £25 for designs placed 1st, 2nd and 3rd respectively. If the author of a premiated design is entrusted with the work, his premium is to merge in his commission, which will be at the rate of 5 per cent., and is to include for attendances at committee meetings, railway fares, hotel expenses, &c. An assessor is to be appointed to *assist* the Committee in judging the merits, suitability and cost of the various designs submitted. That his decision will not be held as final and binding will have been gathered from the numerous reservations of the Committee referred to in the foregoing comments.

Nurses' Home, Wolverhampton.

The size of the building may be gauged roughly by the number of bedrooms required—namely, 52 of an average size of 100 sq. ft. each. Except that the cost of £5,000 seems none too much for the amount of accommodation, the competition looks satisfactory. An assessor is to be appointed. There are no premiums, but this is of small moment in a work of this value.

A Glasgow Building Estate.

We notice in the "Glasgow Herald" a letter from a Glasgow architect in reference to the competition for laying-out an estate belonging to the Corporation at Riddrie. This correspondent states that from the debate at the last meeting of the Town Council it would appear that there was only a slender chance of the houses proposed being built, and he protests that the premiums offered, £75, £50 and £25, are altogether insufficient, bearing in mind the amount of money involved in the scheme. He also draws attention to the fact that there is no absolutely independent assessor.

Branch Dispensary, Smethwick, Birmingham.

For this building, to be erected at the corner of Cape Hill and Durban Road, Smethwick, the design of Mr. F. J. Gill, of Smethwick, has been selected. There were four other Birmingham architects invited to submit designs. The dispensary is estimated to cost £5,000.

A South African Competition.

A competition has recently been decided for new headquarters for the Bank of Africa to be built in Capetown. Mr. Reginald Blomfield, A.R.A., was the assessor. The design by Mr. Thomas A. Sladdin, F.R.I.B.A., of Capetown, was placed first and has been accepted by the Bank. The next four designs were by the following competitors, who were awarded an equal proportion of the honorarium voted by the Directors:—Messrs. Baker and Masey, William Black, Parker and Forsyth and Stucke and Bannister.

Grammar School at Ambleside.

The design of Messrs. Walker, Carter and Walker, of Windermere, for a new grammar school at Ambleside has been selected in competition by the Governors of the Kelsick Trust.

Schools at Consett.

In the competition for new schools at Consett, for the Durham County Council, the assessor, Mr. W. Rushworth, F.R.I.B.A., has awarded first place to Mr. W. H. Knowles, F.S.A., Newcastle; 2nd, Mr. J. Garry, F.R.I.B.A., Hartlepool; 3rd, Messrs. Church and Moscrop, Darlington.

Proposed County Offices for Somerset.

At the last meeting of the Somerset County Council it was decided that plans and estimates should be obtained from one or more competent architects resident in Somerset for the schemes reported upon by the County Surveyor for building new county offices on the old Taunton prison site or the one adjoining the Shire Hall.

IN PARLIAMENT.

(*From our Press Gallery Representative.*)

Glastonbury Abbey.

Replying to Major Anstruther-Gray on Friday last in reference to the projected sale of Glastonbury Abbey, Mr. L. Harcourt said the matter was receiving very careful attention, the Acting Inspector of Ancient Monuments having visited the Abbey during the last few days.

Regent's Park Fence.

In answer to Sir Samuel Scott, who raised the question of the substitution of an iron spiked fence in place of the present oak timber palings around Regent's Park, to which residents strongly objected, Mr. Harcourt said he was unable to stop the work and allow the timber fence to remain because it was in a state of decay and past repair.

Selby Abbey.

On Friday Mr. Lane-Fox drew attention to the fire at Selby Abbey and asked the Chancellor of the Exchequer whether His Majesty's Government could make any grant or give any assistance in the work of restoring the building, bearing in mind that when York Minster was burnt down in 1829 the Government of the day gave a grant of £5,000 worth of oak from the Government dockyards towards its restoration.

The Chancellor of the Exchequer (Mr. Asquith) said he had made enquiries at the Record Office, but had not been able to ascertain precisely what occurred in 1829. The present case did not appear *prima facie* to be one to which the Government could properly make a grant of public money, but he had no official information, nor had he received any application on the subject.

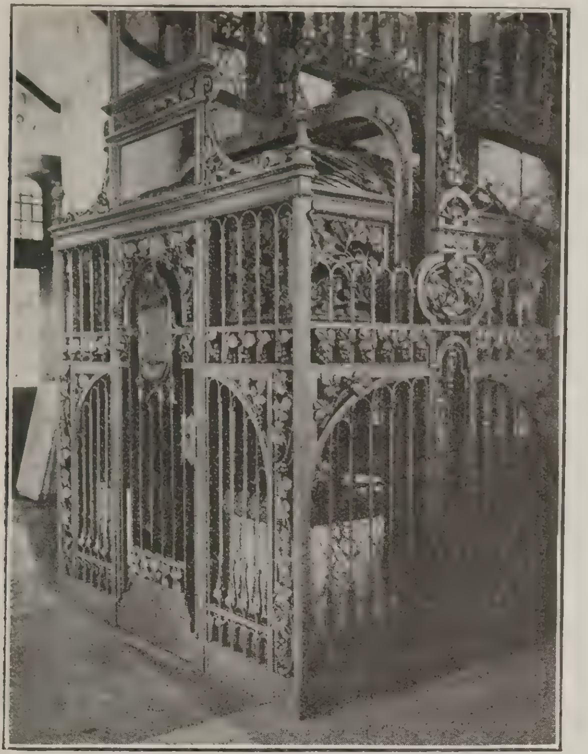


FIG. 1.—AN ELABORATE METALWORK LIFT ENCLOSURE.

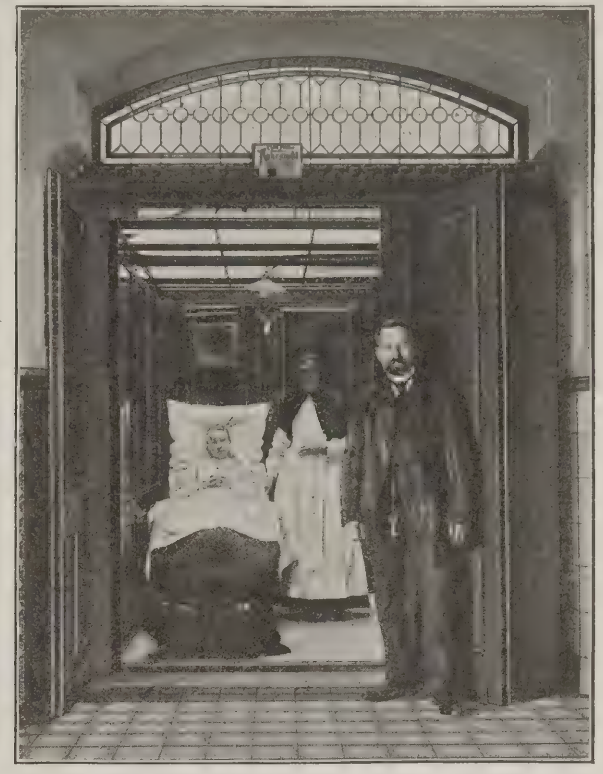


FIG. 2,—LIFT AT THE ST. MARIEN HOSPITAL, DÜSSELDORF.

Trade and Craft.

Electric Lifts.

The firm of Carl Flohr, founded in 1852, was one of the earliest engaged in the manufacture of lifts, cranes and similar appliances. Mr. Carl Flohr is recognised in Germany as a pioneer in this branch of construction. The firm claims, with apparent good reason, to be the first to introduce safety devices, and the German by-laws, which first required lifts to be equipped with such safety devices, were modelled on the Flohr lifts as a standard. On the Continent the firm has been very successful in securing gold medals and other awards at various exhibitions, and it is now one of the largest engaged in this branch of industry. To-day about 1,200 Flohr lifts are in use all over the world. A London office has just been opened at 73a, Queen Victoria Street, E.C., and a sumptuous English catalogue issued. The firm has introduced many striking contrivances that have been copied by other makers, and it has continued to keep in the front rank, but details of connections and various mechanical devices are of interest only to specialists, and we confine our remarks, therefore, to various general features of design. From the public point of view, safety-catches and safety-locks are of primary importance, and by-laws chiefly concern such parts, but, in addition to these, the modern lift is provided with signal apparatus, annunciator, automatic stop devices, and speed regulator, all of which directly or indirectly bring it to a standstill in the case of danger. Accidents hardly ever occur with modern lifts, and then only as a result of gross neglect. Messrs. Flohr have always paid special attention to such matters. They make a speciality of invariably fitting safety devices to goods lifts also, as frequent accidents have occurred with such lifts due to persons travelling in them. As it is impossible to prevent factory employees and others from taking foolhardy risks in this way, although strictly forbidden, the firm thinks that the best precaution is to fit a safety device. Many of their factory lifts are situated outside in open steel-frame structures.

Of recent years automatic push-button lifts, worked without any attendant, have come greatly into favour. In these the door-locks are electrically worked. By opening the door the circuit is broken, the lift stops, and cannot start again till all the doors are closed. These automatic lifts have been brought to a very high state of perfection by Messrs. Flohr. They are of three different kinds:—(*a*) The simple button control operated from the cage only; (*b*) a button control for passenger lifts in private houses where either the porter or passenger works the lift; (*c*) a universal button control for passenger lifts. In this last the car, on leaving the floor, locks the door and travels to the desired landing and stops, unlocking the door automatically. The current is cut off as soon as the door is opened and the car cannot move until the door is closed again. On the outside of the shaft near the door are two buttons, one marked with the number of the floor, the other marked "ground floor," or with the name of the landing where the lift is intended to stand as a rule. By pressing the button marked with the particular floor the lift immediately goes up or down to take passengers from this floor. If the other button marked "ground floor" is pressed, as long as the lift is running electrically-lighted signs appear at all floors indicating that the lift is engaged. In the car there is an additional button marked "stop" which enables the passenger to stop immediately and change its direction. The Flohr automatic lifts have an arrangement which is distinctly an advantage. It very often happens that just as a passenger gets into the car and closes the door some person waiting at another floor presses a button, which locks all the other buttons, and the passenger is taken to the wrong floor. With the Flohr lift this cannot happen on account of a clever device which automatically disconnects the outside push button and so restricts its use to the person entering the cage.

The whole of the parts of the Flohr lifts are manufactured in the firm's workshops, including the steelwork and the metal grilles, often elaborate in detail, such as Fig. 1. Lifts are much more frequently used abroad than in this country, and Messrs. Flohr have had to build many special kinds of lifts which are particularly interesting to architects; as, for instance, Fig. 2, showing a hospital lift at the St. Marien Hospital, Düsseldorf. This lift has a special arrangement by which it stops very accurately level with the floor, so that a patient can be wheeled out without jolting. It has impervious washable surfaces so that there is no lodgment for dirt or germs. This lift is the result of many years of careful study, in which the wishes and demands of the highest medical authorities have been respected. These special lifts were installed by Messrs. Flohr in all the largest and most up-to-date hospitals in Germany.

There are many other points that Messrs. Flohr, with their great experience in this class of work, have made improvements upon. For instance, we are accustomed to see an ugly weight travelling up and down the shaft. At the small expense of a few feet of extra rope, the weight can be arranged to travel in a covered groove in the wall, so as to be out of sight.

A Central Reference Library for Westminster is proposed to be formed at Caxton Hall, to include the 40,000 volumes at present spread over the three branch establishments in Great Smith Street, Buckingham Palace Road, and St. Martin's Lane. Mr. John Murray, F.R.I.B.A., has been instructed to prepare a scheme and submit an estimate of cost for carrying out the alterations.

Complete List of Contracts Open.

WITH a few exceptions, news of Contracts Open are not repeated after they have been published once in these columns, so that readers will find particulars in our previous issues of other contracts that still remain open.

Unless expressly stated to the contrary, all deposits required for bills of quantities, &c., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair-wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

Nov. 1. Kendal.—*Additions and Alterations* to the Collin Croft Brewery for the Collin Croft Brewery Co., Ltd. Plans and specifications can be seen and further particulars obtained at the office of J. Stalker, M.S.A., architect, Kendal, to whom tenders (under cover) may be sent not later than Nov. 1.

Nov. 1. Surbiton.—(*1*)*Erecting a dwarf boundry wall* about 80ft. in length, in front of the Electricity Station, Ewell Road, Surbiton. (2) Providing and erecting 8ft. oak pale fence and gates, about 500ft. in length, on the east and north sides of the Electricity Station, Ewell Road, Surbiton, for the U.D C. Plans and specifications of the works can be seen on application to the Surveyor, District Council Offices, Surbiton. Tenders made out on the forms supplied, enclosed in sealed envelopes, endorsed "Tender for Wall (or fence) Electricity Station" as the case may be, must be delivered to E. J. Bell, deputy clerk to the Council, District Council Offices, Surbiton, on or before noon on Nov. 1.

Nov. 2. Leasingthorne.—*Rebuilding Shamrock Inn*, Leasingthorne, for the N.E. Breweries, Ltd. Plans, specifications, &c., may be seen at the Shamrock Inn. Tenders to be sent in to T. H. Murray, architect, Consett, on or before Nov. 2.

Nov. 2. Hull.—*Erection of three shops* in Jameson Street for the Property Committee. Drawings and specification may be seen of J. H. Hirst, city architect, Town Hall, Hull, and quantities obtained upon a deposit of £2 2s. Remittances to be made payable to the City Treasurer. Tenders, sealed and endorsed "Shops, Jameson Street," are to be addressed to the Chairman of the Property Committee, and delivered at the Town Clerk's Office, Hull, before 10 a.m. on Nov. 2.

Nov. 5. London, S.W.—*1. Erection of two shelters* in the playgrounds of the Special School, and alterations of playgrounds at the Queen's Road School. 2. Painting of railings round the Dundonald Road School. 3. Painting of external wood and ironwork of the old portion of the Queen's Road School, for the Borough Council of Wimbledon. A plan may be seen at, and specifications and form of tender obtained from, the Education Office, 12, Queen's Road, Wimbledon. Tenders must be delivered to A. Steele Sheldon, clerk, 12, Queen's Road, Wimbledon, by or before 12 noon on Nov. 5.

Nov. 5. Odiham.—*Alterations* at the Odiham Police Station. Persons desirous of tendering may see plan, specification, and conditions of contract, and obtain bills of quantities and all necessary information at the office of W. J. Taylor, county surveyor, the Castle, Winchester, on and after the 22nd Oct., between the hours of 9 a.m. and 5 p.m. (Saturdays 9 a.m. and 1 p.m.). A deposit of £2 2s. will be required for a copy of the bills of quantities. Deposits must be made by cheque payable to Hants County Council, and crossed "Bank of England," or particulars will not be sent. Tenders, endorsed "Proposed Alterations, Odiham Police Station," are to be delivered to H. Barber, clerk of the County Council, the Castle, Winchester, on or before Nov. 5.

Nov. 6. Low Greenriggs, Underbarrow.—*Renovating the farm buildings* at Low Greenriggs, Underbarrow, where plans and specifications can now be seen. Tenders to be sent to J. Bell, architect, Coniston, R.S.O., before 10 a.m. Nov. 6.

Nov. 6. Wicklow.—*Altering, enclosing and repairing 16 cottages* on the Wicklow Murrough, in accordance with a plan and specification prepared by the Town Surveyor, from whom all particulars can be obtained. Tenders endorsed "Murrough Cottages," to be addressed to the Chairman, and lodged with F. W. MacPhail, town clerk, Town Hall, Wicklow, not later than 10 a.m. on on Nov. 6. Parties tendering must enter into a bond for the due performance of the work.

Nov. 6. London, S.E.—*Alterations and additions to porter's lodge* of the Home for Aged Poor, Elder Road, West Norwood. Tenders, which will be received only on the printed form, sealed, and endorsed "Tender for Porter's Lodge, Norwood," must be sent by post on or before Nov. 6, addressed to W. Thurnall, clerk, Guardians' Board-room and Offices, Brook Street, Kennington Road, S.E., and will be opened in the Board-room at noon on the following day, when all persons tendering, or their authorised agents, must be in attendance. Drawings can be inspected at the architect's office, of E. C. Beaumont, 78, Fleet Street, E.C., between the hours of 3 and 5 p.m., any day but Saturdays, and specification and form of tender can be obtained at the office of the Clerk to the Guardians on personal application, and on receipt of a deposit of £2.

Nov. 8. Teignmouth.—*Erection of two barge flats*, to be used in carrying dredgings raised by their steam dredger, for the Harbour Commissioners. Particulars of dimensions, &c., to be obtained of E. J. F. Tozer, clerk to the Teignmouth Harbour Commissioners, Teignmouth, and tenders to be sent to him on or before Nov. 8.

Nov. 8. Manchester.—*Alterations and additions to Gorton Baths.*—Drawings may be seen, and specifications and bills of quantities obtained, at the office of the City Architect, Town Hall, upon payment of £1 1s. Sealed tenders, enclosed in the official envelope, to be delivered at the above office not later than 5 p.m. on Nov. 8.

Nov. 8. Cornforth.—*Erection of new butchering premises*, stabling, &c., at Old Cornforth, for the Cornforth Co-operative Society, Ltd. Plans, &c., may be inspected and bills of quantities obtained, on depositing £1, on application to H. T. Gradon, architect, Market Place, Durham, until Nov. 8, on which date properly endorsed tenders are to delivered to him.

Nov. 8. Maidstone.—*Taking down a portion of the old Bluecoat School*, in Knightrider Street, Maidstone, and erecting a new Baptist Church upon the site. Plans and specifications may be seen and bills of quantities obtained on application to Ruck and Smith, architects, 86 Week Street, Maidstone. Sealed tenders are to be delivered to them not later than 5 p.m. on Nov. 8.

Nov. 8. Carmarthen. *Conversion into offices* of Bank House. Spilman Street, Carmarthen, for the C.C. Tenders are invited from builders, painters, decorators, and furnishers. Copies of specifications may be obtained from the offices of the County Surveyor, King Street, Carmarthen, or of the County Education Architect, Shire Hall, Carmarthen. Tenders sealed and endorsed "Bank House Offices," are to be in the hands of J. W. Nicholas, clerk of the County Council, Shire Hall, Carmarthen, on or before Nov. 8.

Nov. 8. London, N.—*Supply of building materials and timber* till the 25th March, 1908, for the Guardians of the Poor of the Parish of St. Mary, Islington. Sealed tenders, endorsed "Tender for ——," and addressed to the Guardians, must be delivered to the Guardians' offices, St. John's Road, Upper Holloway, on or before November 7. Printed forms of tender, with conditions of contract and estimated quantities required, must be obtained from the clerk, as no others will be received. The tenders will be opened on November 8, at a meeting of the Guardians.

Nov. 10. Gerrans.—*Renovating the Wesleyan Chapel*, Gerrans. Specifications may be seen at Mr. Barnett's, chapel keeper, Gerrans. Endorsed tenders to be sent on or before Nov. 10, to J. Lobb, Pollaughan, Portscatho.

Nov. 10. Penzance.—*Erection of a wing* and other additions and alterations to the Riviera Palace Hotel, Penzance. The drawings and specification may be seen at the offices of O. Caldwell, F.R.I.B.A., architect, Victoria Square, Penzance. Sealed tenders, endorsed, "Tender for Riviera Palace Hotel," to be sent to the Secretary, Riviera Palace Hotel Co., Ltd,, 6, Clement's Inn, Strand, London, on or before Nov. 10.

Nov. 12. Belfast.—*Erection of new shops* and warehouse in Smithfield for Simpson & Mitchell, glass and colour merchants. Plans and specifications may be had of Thomas Houston, architect and civil engineer, King's Court, Wellington Place, Belfast. Plans and specifications may be had of him on or before Nov. 12.

Nov. 12. Blackburn.—*Demolition of the buildings* Nos. 116a and 116b, King Street, including the purchase and removal of the materials. Tenders, endorsed "Buildings, King Street," to be sent to L. Beard, town clerk, Town Hall, Blackburn, not later than 12 o'clock at noon on Nov. 12.

Nov. 12. Westham.—*Erection of a new public elementary school* for infants at Westham. Persons desirous of tendering are requested to send their names and addresses to F. J. Wood, county surveyor of East Sussex, County Hall, Lewes, on or before Nov. 12, from whom full particulars can be obtained.

Nov. 13. Southampton.—*Erection of a new Inland Revenue office* at Southampton. Drawings, specification, and a copy of the conditions and form of contract may be seen on application at the Collector's office, Inland Revenue, Southampton. Bills of quantities and forms of tender may be obtained at H.M. Office of Works on payment of £1 1s. Tenders must be delivered before 12 o'clock noon on Nov. 13, addressed to the Secretary, H.M. Office of Works, &c., Storey's Gate, London, S.W., and endorsed "Tender for Southampton Inland Revenue Office."

Nov. 14. Pontypridd. — *Erection of Park School*, Treforest, for the accommodation of 300 boys, 300 girls, and 300 infants, together with cookery and manual instruction centres. Plans and specification can be seen at the office of P. R. A. Willoughby, A.M.I.C.E., surveyor to the Council, and from whom bills of quantities can be obtained on payment of £3 3s. The bill of quantities must be sent in under seperate cover, with the name of the person tendering on the outside, under seal, to the Surveyor, and will be returned to him unopened in the event of his tender not being accepted. Tenders, on the prescribed form, to be sent under seal to D. Milton Jones, secretary, Municipal Buildings, Pontypridd, not later than Nov. 14.

Nov. 15. Tilbury.—*Erection of a police station* at Tilbury for the Standing Joint Committee of the Court of Quarter Session and C.C. of Essex. The drawings, specification, and form of contract may be inspected at the office of F. Whitmore, county architect, Duke Street, Chelmsford, between the hours of 10 and 5 o'clock on any working day except Saturday. Persons desirous of tendering must send in their names and addresses on or before Nov. 5, to the County Architect, enclosing a deposit of £5, in return for which a copy of the quantities and form of tender will be sent. The contractor will be required to give the bond of an approved guarantee society in the sum of £200 as security for the due performance of the contract. Bills of quantities and forms of tender can be obtained of the County Architect. Sealed tenders, endorsed "Tender Police Station, Tilbury," must be addressed to H. W. Gibson, Clerk of the Peace, Shire Hall, Chelmsford, and reach his office not later than Nov. 15.

Nov. 15. Helsington Laithes, Kendal.—*Erection of a residence* at Helsington Laithes, Kendal, for Mrs. Dixon. Tenders are invited in whole or separate trade contracts. Plans may be seen and quantities and specifications obtained at my office from November 1 to November 15, upon which latter date all tenders are to be sent (under cover) to J. F. Curwen, F.S.A., F.R.I.B.A., architect and sanitary engineer, 26, Highgate, Kendal, before noon. The whole to be subject to the ordinary conditions as by customs are established.

Nov. 23. Aldborough.—*Erection of Aldborough proposed new school.* Builders desirous of tendering should send in their names not later than Nov. 5, to C. J. Brown, architect, Cathedral Close, Norwich, at whose office plans and specifications can be inspected and bills of quantities obtained. A deposit of £1 1s. will be required. Tenders must be delivered by 12 noon on Nov. 23, addressed to "The Secretary, Norfolk Education Committee, 57, London Street, Norwich," and endorsed "Tender for Aldborough School."

Nov. 27. Fulwood.—*Erection of a new public elementary school*, to accommodate 162 children, at Fulwood, near Preston, for the Lancashire Education Committee. The plans may be seen and bills of quantities obtained at the office of H. Littler, county architect, 16, Ribblesdale Place, Preston, by payment of a deposit of £2. Tenders must be delivered before twelve o'clock noon on Nov. 27, sealed and endorsed, to J. W Lloyd, 4, Lune Street, Preston.

Nov. 27. Huncoat.—*Erection of a new public elementary school* to accommodate 300 children at Huncoat, near Accrington, for the Lancashire Education Committee. The plans may be seen and bills of quantities obtained at the office of H. Littler, county architect, 16, Ribblesdale Place, Preston, by payment of a deposit of £2. Tenders must be delivered before 12 o'clock noon on Nov. 27, sealed and endorsed, to F. Shutt, Council Offices, Mill Street, Padiham.

No date. Basford.—*Erection of new boiler-house, chimney, mortuary and piggeries* at the Workhouse of the Basford Union. Builders desirous of tendering may see the plans and obtain bill of quantities upon applying to W. V. Betts, architect, Bank Offices, Old Basford, Nottingham, and depositing a cheque for £2 2s.

No date. Exeter.—*Taking down the existing premises* and erecting a new block of buildings at the junction of High Street and Goldsmith Street, Exeter, for Messrs. Lennards, Limited. Plans and specifications may be seen at the offices of J. Crocker, F.R.I.B.A., architect and surveyor, 98, Queen Street, Exeter, and a copy of the bills of quantities, when ready, will be sent on receipt of a deposit cheque for £2 2s,

No date. Pinxton.—*Erection of new outbuildings* to the Pinxton Council Schools. Specification, &c., may be had on application to H. C. Taylor, architect, Pinxton.

ENGINEERING.

Nov. 1. Cork.—*Enclosing well* at Rochestown Wood for the R.D.C. Specifications may be inspected at the board room, Cork Workhouse. Each party tendering is required to give the names and addresses of two solvent sureties who are willing to enter into a bond for the due performance of the contract. Tenders will be received up to the hour of 12 o'clock noon of Nov. 1.

Nov. 1. Glasgow.—*Repair of the embankment* on the north side of the river Clyde between the boathouse near the Weir and the Humane Society's house for the Corporation. Plans may be seen and specifications and forms of tender obtained on application to A. B. M'Donald, city engineer, City Chambers, Cochrane Street; and sealed tenders, marked "Tender for Repair of River Embankment," must be lodged with A. W. Myles, town clerk, City Chambers, Glasgow, not later than 10 a.m. on Nov. 1.

Nov. 1. Cork.—*Sinking well and erecting pump* according to specifications at Inniscarra for the R.D.C. Each party tendering is required to give the names and addresses of two solvent sureties who are willing to enter into a bond for the due performance of the contract. Forms of tender can be obtained and specifications inspected at the board room, Cork Workhouse. Tenders on any other forms than those issued from this office will not be considered

Nov. 6. Stonehaven.—*Heating installation* for Kincardineshire Combination Poorhouse, Stonehaven, embracing boiler and heating plant, mason, carpenter, and plumber work, &c. Plans, specifications, schedule of quantities, and other information may be had from A. Stewart, 15, Leadside Road, Aberdeen, or J. Mitchell, clerk to the Board of Management, 25, Market Square, Stonehaven, with the latter of whom offers, marked "Tender for Heating," must be lodged not later than Nov. 6.

Nov. 9. Donaghadee.—*Sinking of a deep bore-hole* and for an alternative scheme of sinking a deep well in connection with the proposed new water supply for the town for the U.D.C. Stipulations, specifications, form of tender and schedule, and further particulars may be obtained at the offices of H. J. Weaver, C.E., F.G.S., engineer, Lipton Chambers, Gloucester, on deposit of £1 1s. Sealed tenders, endorsed "Waterworks," to be delivered to D. Walker, town clerk, Donaghadee, not later than 4 p.m. on Nov. 9.

Nov. 13. London. — *Reconstruction of the bridge* carrying Hampstead Road over the London and North-Western Railway, near Euston Station, in the borough of St. Pancras, in the Administrative County of London. Persons desiring to submit tenders may inspect the drawings and obtain the specifications, bills of quantities, form of tender, and other particulars upon application to the chief engineer, M. Fitzmaurice, C.M.G., at the County Hall, Spring Gardens, S.W., upon payment to the cashier of the Council of the sum of £3. Full particulars may be obtained on application at the County Hall, Spring Gardens, previously to the payment of the fee for the specification, &c. Tenders must be upon the official forms, and the printed instructions contained therein must be strictly complied with. Fair wages clause. Each tender is to be delivered at the County Hall in a sealed cover, addressed to "The Clerk of the London County Council, Spring Gardens, S.W.," and marked "Tender for Reconstruction of Bridge carrying Hampstead Road over the London and North-Western Railway." No tender will be received after 10 a.m. on Nov. 13.

Nov. 17.—Radcliffe.—*Construction of permanent way*, including copper bonding, of about 1½ miles of single line for the U.D.C. Drawings can be inspected and copies of general conditions of contract, specification, and bill of quantities obtained on application to W. L. Rothwell, engineer to the Council, on payment of a deposit of £2 2s. Sealed tenders, endorsed "Tramways Extension," must be delivered to S. Mills, clerk to the Council, Council Offices, Radcliffe, on or before Nov. 17.

Nov. 22. London, N.E.—*Supply of Specification No. 28.*—One 1,500-kilowatt steam dynamo and accessories. General conditions, specification, drawings, form of tender, and form of agreement may be inspected at the offices of R. Hammond, M.Inst.C.E., the consulting engineer to the Council, 64, Victoria Street, Westminster, S.W., and may be obtained there on making a deposit of £5. Extra copies of the specification may be obtained by bona fide tenderers at a charge of 5s. per copy, which sum will not be refunded. Tenders, sealed and marked "Tender for Steam Dynamo," must be addressed to W. A. Williams, at the Town Hall, Hackney, and be delivered on or before 4 p.m. on Nov. 22. Fair wages clause.

IRON AND STEEL.

Nov. 3. Durban, Natal.—*Supply and delivery "free on board"* of about 60 tons of 7-in. cast-iron pipes and special castings (from British ironfounders only) for the Corporation of Durban. Specifications can be obtained from W. H. Radford, C.E., Albion Chambers, Nottingham, consulting and representative engineer to the Corporation, on deposit of £1 1s. Sealed and endorsed tenders must be delivered to Webster, Steel & Co., agents to the Durban Corporation, 5, East India Avenue, Leadenhall Street, London, E.C., on or before Nov. 3.

Nov. 5. Bristol.—*Supply of* 30 cast-steel fairleads for the Docks Committee of the City and County of Bristol. Copies of the specification and copies of the contract drawing can be obtained from W. W. Squire, engineer, Engineer's Office, Cumberland Road, Bristol, on production of a receipt from the Secretary of the Docks Committee, showing that the sum of £1 has been paid as deposit. Tenders must be enclosed in a sealed envelope. endorsed "Tender for Fairlights," and addressed to the Secretary of the Docks Committee, 19, Queen Square, Bristol, and must be delivered to him, accompanied by the prescribed documents, before 10 a.m. on Nov. 5.

Nov. 5. London, E.C.—*Supply of steel rails*, fishplates, fishbolts and nuts, and wrought-iron spikes for the Board of Directors of the Bengal-Nagpur Railway Co., Ltd. Specifications and forms of tender can be obtained at the company's office, 132, Gresham House, Old Broad Street, E.C. For each specification a fee is charged, which will not be returned. Tenders to be delivered not later than noon Nov. 5th.

Nov. 10. Accrington.—*Supply of about 1,350 tons of steel tramway rails*, together with the necessary fish-plates, &c., for the tramway committee. Specifications, form of tender and other particulars may be obtained on application to the Borough Engineer, W. J. Newton, Assoc.M.Inst.C.E., Town Hall, Accrington, on payment of a deposit of £2 2s. Sealed tenders, endorsed "Tramway Rails," to be delivered at the office of A. H. Aitken, Town clerk, Town Hall, Accrington, not later than November 10th.

Nov. 13. London, S W.—*Supply of* (1) 1,200 pairs wheels and axles, (2) 20,000 steel sleepers and keys, for the Board of Directors of the Southern Mahratta Railway Co., Ltd., as per specifications and drawings, which may be seen at the Offices of the Company, 46, Queen Anne's Gate, S.W. The charge for each specification is £1 1s., which will not be returned. Tenders must be sent in addressed to the Secretary, marked "Tender for Wheels and Axles," or as the case may be, not later than 12 noon on Nov. 13.

PAINTING AND PLUMBING.

Nov. 5. Dublin.—*Painting of the roof* over the Exchange Platform of the G.N.R. (I.) and D.W. and W.R. Companies at Amiens Street, Dublin. Parties wishing to tender for the work can see the specification at the office of W. H. Mills, engineer-in-chief, Amiens Street Terminus, Dublin, or copy of same at the office of the District Engineer, G.N.R. (I.), Belfast, and forms of tender can be obtained at either of the above-mentioned places on payment of 1s. (not returnable) each. Tenders, made out on the forms supplied by the Company, and endorsed "Tender for Painting," should be delivered to T. Morrison, Secretary, Secretary's Office, Amiens Street Terminus, Dublin, not later than 10 a.m. on Nov. 5.

Nov. 6. Stockton-on-Tees.—*Painting and other work* at the Workhouse Hospital for the Guardians of the Stockton Union. Full particulars and forms of tender to be obtained from the Workhouse Master. Tenders (in covers, endorsed "Tender for Painting") to reach F. B. Watson, clerk to the Guardians, Stockton-on-Tees, not later than Nov. 6 at 12 noon.

Nov. 8. Barnstaple.—*Painting and repairing* the whole of the exterior parts of the Barnstaple Union Workhouse and Cottage Homes. Specifications of the required work may be seen on application to the Master of the Union Workhouse. Tenders, endorsed "Tenders for Painting," must be sent to W. H. Toller, clerk, Barnstaple, not later than Nov. 8.

ROADS AND CARTAGE.

Nov. 6. Mitcham.—*400 tons of hard blue Guernsey granite spalls*, for the Guardians of the Holborn Union, to be delivered in such quantities as may be ordered, free of all delivery charges and cartage to the Workhouse, Western Road, Mitcham, Surrey. The granite must be weighed as sent in, and the workhouse weighbridge weights charged for. Tenders (by letter) must be delivered to J. A. Battersby, clerk to the Guardians, Holborn Union Offices, 53, Clerkenwell Road, E.C., not later than 12 noon on Nov. 6.

Nov. 6. Lepton.—*Supply and delivery of a ten-ton steam-roller* and scarifier. Tenders may be sent not later than Nov. 6, to J. Sharp, clerk, Queen Street, Huddersfield.

Nov. 7. Twickenham.—*Forming, levelling, kerbing, channelling*, paving, metalling and making good the following streets within the district of Twickenham: Bridge Road, Broadway Avenue, Carnac Road, Laurel Avenue, Lebanon Park, Radnor Road, for the U.D.C. Plans can be seen and specifications and forms of tender obtained on application to F. W. Pearce, surveyor to the Council, Town Hall, Twickenham. No tender will be accepted unless made on the prescribed form. Sealed tenders, endorsed with the name of the street and marked "Tender for Street Improvement Works," to be delivered to H. J. Saunders, clerk to the Council, Town Hall, Twickenham, not later than 12 o'clock noon on Nov. 7.

No date. Cardiff.—*Construction of roads and sewers* on Heathfield Estate, Gabalfa, Cardiff. Plans and specifications may be seen and quantities obtained at the offices of E. Down, A.R.I.B.A., 31, High Street, Cardiff, on deposit of £2 2s.

SANITARY.

Nov. 3. Earsdon.—*Laying of an 18-in. outfall sewer*, for the R.D.C. The work in connection therewith comprises the following:—Furnishing and laying of 520 lineal yards or thereabouts of an 18in. cast-iron pipe and 2,703 lineal yards or thereabouts of an 18-in. earthenware pipe (this to include all necessary manholes, &c.). Full particulars, drawings and specification together with bills of quantities and forms of tender may be seen at the office of the Surveyor on personal application to J. R. MacMillen, Council Buildings, Shiremoor, between the hours of 9 and 10 a.m. and 4 and 5 p.m. on payment of a deposit of £3 3s. Sealed tenders, endorsed "Tender for Outfall Sewer" must be delivered to A. Dale, clerk to the Council, 85-86, Howard Street, North Shields, not later than Nov. 3.

Nov. 8. Monaghan.—*Covering sewerage purification tanks*, for the Joint Committee of the Monaghan Asylum, in accordance with plan and specification which may be seen at the board-room of the asylum between the hours of 10 a.m. and 5 p.m. Tenders to state the names of two solvent securities who will be prepared to enter into a bond conditioned for the due fulfilment and for the completion of the contract by such as the committee may determine. Tenders to be forwarded by registered post not later than Nov. 8.

Nov. 10. Swindon.—*Supply and delivery to the G.W.R. Station*, Swindon, of a cast-iron public urinal in accordance with the plan and particulars to be obtained on written application to H. J. Hamp, borough surveyor, Town Hall, Swindon. Tenders, endorsed "Public Urinal," to reach R. Hilton, town clerk, by 12 noon on Nov. 10.

Nov. 14. Leeds.—*Two slip sets of combined engines* and centrifugal pumps for pumping crude sewage from the main sewer into prepipitation tanks at Knostrop Sewage Works for the Sewerage Committee. Copies of drawing, conditions of contract and form of tender may be obtained at the office of G. A. Hart, engineer, Municipal Buildings, Leeds, on deposit of *bona fide* tender and all documents supplied to the tenderer. Tenders to be addressed to the Town Clerk, Town Hall, Leeds, and endorsed "Tender for Pumping Engines, Knostrop," not later than 10 a.m. on Nov. 14.

Nov. 19. Glasgow.—*Construction of Sewer No.* 6 (being a 3-ft. by 2-ft. brick sewer), extending along Dumbreck Road from Manor Road to Fleurs Avenue, a distance of about 825 lineal yards. Plans, specifications and working drawings may be seen, and specifications and schedule of quantities and forms obtained, on application to the City Engineer, City Chambers, 64, Cochrane Street, Glasgow, on payment of a fee of £5 5s. Sealed offers, marked outside "Tender for Sewer No. 6," must be lodged with A. W. Myles, town clerk, City Chambers, Glasgow, not later than Nov. 19. The resident engineer will meet intending offerers in Paisley Road, at Ibrox Station, at 11 on Nov. .

Dec. 19. Herne Bay.—*Construction of about 3¼ miles of brick* and concrete and pipe sewers, with all the necessary manholes, ventilators and flushing arrangements, the construction of a pumping station, cottage and buildings, and the provision of pumping machinery, for the U.D.C. Plans and specifications of the works may be seen and the form of tender obtained at the office of B. Latham, M.Inst.C.E., Parliament Mansions, Victoria Street, Westminster, the engineer for the works, or at the office or F. W. J. Palmer, the surveyor to the Council, at his office at Herne Bay. The quantities of the several works have been taken out by C. E. Bruges, A.M.I.C.E., 1, Victoria Street, Westminster, and may be had on application either to the engineer or surveyor on deposit of £10. Sealed tenders, on the form supplied attached to the quantities endorsed "Tender for Sewerage Works," are to be delivered at the office of J. Jubb, clerk to the Urban District Council, at Herne Bay on or before noon of Dec. 19.

Nov. 27. Jassy, Roumania.—*Water supply and sewerage* of the town of Jassy. All tenders to be in the Roumanian language, sealed, and to reach the Town Hall, by Nov. 27, at six p.m. The estimated cost of earthworks, subterranean galleries, iron mains from the source to the town, a distance of 91 kilometres, distribution and reservoirs in the town, also for sewerage, is 10,435,000 francs, and a loan of 13½ million francs has been effected to cover the cost. Payments will be made monthly in Roumanian money. Tenders for the whole of the work only will be considered. Necessary guarantee 420,000 francs. Plans and specifications may be seen, and all further information obtained of A. S. Savul, at the Chief Engineer's Office, Town Hall, Jassy.

No date. Chesterfield.—*Laying of new sidings, drainage*, and excavation work at Chatsworth Wagon Works, Chesterfield. Plans, &c., may be seen and bills of quantities obtained at the offices of W. Cecil Jackson, M.S.A., architect and surveyor, 29, Knifesmith Gate, Chesterfield, on depositing £1 1s.

TIMBER.

Nov 3. Dublin.—*Supply of the following stores* for 12 months from Jan. 1. to Dec. 31, 1907, for the Great Northern Railway Company (Ireland):—(38) timber scantlings for wagons and carriages (American white oak), (39) timber (logs, boards, planks, mouldings, sheetings, &c.). Forms of tender can be obtained from the secretary on payment of 1s. for each form. Tenders must be for the supply of goods in accordance with the company's patterns. These patterns may be seen at the General Stores Depot, Dundalk (they cannot be sent away for inspection), between 10 a.m. and 4 p.m., except on Saturdays, when they will not be on view after 12 noon. Tenders, made out on the company's forms, and endorsed "Tender for Stores," should be delivered to T. Morrison, secretary, Amiens Street Terminus, Dublin, by 10 a.m. on Nov. 3.

MISCELLANEOUS.

Nov. 5. London.—*Supply of brass and gunmetal goods*, gas and plumbers' fittings, cast-iron, electric fittings, cables, engineers' goods, wrought iron tubing, firewood, oak pales and posts, iron and steel, oils, tools and implements, and tramway car fittings, for one year from 1st Jan., 1907, for the L.C.C. Full particulars and also information as to the conditions to be observed by tenderers is given in the London County Council *Gazette*, of Oct. 22 (price 1d., post free 1½d.), which can be obtained from P. S. King & Son, 2 and 4, Great Smith Street, Westminster, S.W. Tenders must be upon the official forms, to be obtained on personal application or by sending a stamped addressed foolscap envelope to the Clerk of the Council, County Hall, Spring Gardens, S.W., and no tender will be received after 10 a.m. on Nov. 5.

Nov. 5. Glasgow.—*Supply of the following stores* for 12 months from Jan. 1, 1907, for the Directors of the Caledonian Railway Co.:—(2) bolts and nuts; (3) brick, clay and chimney cans; (17) colours and paints; (24) gas and water fittings; (24a) malleable iron pipes and fittings; (25) glass; (27) hammer shafts, &c.; (32) iron chain; (33) iron rivets; (34) galvanised wire, wire ropes, and wire fencing requisites; (40) locks; (41) nails sprigs and tacks: (49) screws; (52) spelter, tin and lead; (60a) electric lighting material and fittings; (73) cement, lime and slates. Specifications and forms of tender and any other necessary information may be obtained from J. Fergusson, stores superintendent, Caledonian Railway, Charles Street, St. Rollox, Glasgow. Patterns can be inspected till Nov. 2, from 9 a.m. till 5 p.m., at the company's stores, Charles Street, St. Rollox (Saturday, 9 a.m. till 1 p.m.), and all tenders must be to the company's samples and patterns. Tenders, endorsed "Tender for Stores," to be lodged with J. Blackburn, secretary, 302, Buchanan Street, Glasgow, not later than Nov. 5.

Nov. 6. Aldershot.—*Supply of Portland cement* for the year ending Dec. 31, 1907, for the U.D C. Specification may be seen and full particulars obtained on application at the Surveyor's Offices. Tenders, endorsed "Cement," to be sent to W. F. Foster, clerk, Municipal Buildings, Aldershot, on or before Nov. 6 next.

Nov. 7. St. Giles.—*Supply of earthenware and china* for the Guardians of the Poor of the Parish of St. Giles, Camberwell, to their several establishments, for the period from date of acceptance of tender to Oct. 5, 1907. Persons desirous of tendering can obtain forms for the purpose, containing further particulars, upon application to S. Stevens, clerk to the Guardians, Guardians' Offices, 29, Peckham Road, S.E., and tenders must be delivered to the Guardians' Office, sealed and addressed to the Board of Guardians, marked "Tender for ——," before 12 noon on Nov. 7.

Nov. 19. Dublin.—*Supply of the following stores* for the Directors of the Midland Great Western Railway of Ireland Company. The contracts to commence from Jan. 1 next, and terminate on Dec. 31, 1907:—(4) brass and copper tubes, plates sheets, &c.; (5) brass cocks and gas fittings; (6) bricks, flags, tiles, &c.; (11) cements; (13) copper, tin (ingots), lead, gun-barrel, &c.; (15) glass; (17) iron castings; (18) do. Staffordshire bars, plates, wires, &c.; (19) do. Yorkshire do.; (20) ironmongery; (26) springs, steel and files; (27) steel tyres, axles and plates; (28) timber, &c. Forms of tender can be obtained, on payment of 6d. each, from the Storekeeper, General Stores Department, Broadstone Station, Dublin. Patterns and samples can be inspected at the same place on and after Nov. 1, between the hours of 10 a.m. and 4 p.m., except Saturdays. Contractors cannot be allowed to tender to supply goods to their own patterns, nor can the company's patterns be sent away for inspection. The directors will not consider any tender unless furnished on the company's forms; nor any tender in which any alteration of the form has been made. The tenders to be sent in by post, sealed and endorsed on the envelope, "Tender for Stores, Form No. ....," and addressed to "The Chairman, Broadstone Station, Dublin," so as to reach him on or before 10 a m. on Nov. 19.

Nov. 26. London.—*Supply during 1907 of the following stores* for the L.G. Omnibus Company, Ltd.:—(a) timber; (b) ironmongery, coachmakers', engineers', saddlers', and farriers'; (e) oil, glass, grease and sundries; (k) building materials; (l) gas and water fittings; (m) enamelled iron plates. The schedules will be ready Nov. 12, and may be obtained at the company's coach factory, North Road, Caledonian Road, N., on payment of 2s. 6d. each, where samples also will be on view Nov. 14, 15 and 16, between the hours of 10 a.m. and 5 p.m. Contractors are requested to call and examine the samples before tendering. Sealed tenders, endorsed "Tender for Stores," should be addressed to the Directors, 6, Finsbury Square, E.C., not later than noon, Nov. 26.

TOO LATE FOR CLASSIFICATION.

No date. Salisbury.—*Alterations and additions to No. 13, Catherine Street*, for Messrs. Eldridge and Young. Plans and specifications can be seen at the offices of J. Harding and Son, architects and surveyors, 58, High Street, Salisbury.

Nov. 2. Aber 'een.—*Proposed additions to Straloch House.* Estimates are wanted for the mason, carpenter, slater, and wood panelling works. Plans and specifications may be seen with the gardener or with G. B. Mitchell, architect, 148, Union Street, Aberdeen, with whom offers are to be lodged on or before Nov. 2.

Nov. 13. Yatton.—*Providing and laying* about 7½ miles of cast-iron mains, varying from 2ins. to 6ins. in diameter, and also 1,100 yards of 1½in. galvanised wrought-iron tubing, together with valves and hydrants, and the construction of a concrete and brick service reservoir, to contain 150,000 gallons, for the Long Ashton R,D.C. in accordance with plans and specification prepared by A. P. I. Cotterell, M.Inst.C.E., engineer, 28. Baldwin Street, Bristol. The plans may be seen at his office during usual office hours. Copies of the specification, form of tender, and bill of quantities may be obtained from the engineer by intending contractors on payment of the sum of £3 3s. Tenders on the forms provided must be delivered to A. E. Hicks, clerk, Union Offices, Flax Bourton, near Bristol, under seal, and endorsed "Tender for Yatton Water Supply—Contract 2," at or before 10 a.m. on Nov. 13

Nov. 28. Glanyrafonddu, near Tally.—*Erection of stone and steel bridge* at Glanyrafonddu, near Tally, Llandilo, for the Carmarthenshire C.C. Plans may be seen, at and copies of specification and quantities obtained from,the offices of C. H. Mounsey, county engineer and surveyor, County Surveyor's Offices, Carmarthen, on and after Nov. 7. Sealed tenders are to be in the hands of J. W. Nicholas, clerk of the C.C., Shire Hall, Carmarthen, on or before Nov. 28.

No date. Hunstanton.—*Alterations and additions to shop* at Hunstanton. Also for the erection and completion of a new warehouse on a site situated in Guanock Terrace, Lynn. Plans, &c., and other particulars can be seen at the offices of W. Jarvis and Son, architects, Paradise Parade, King's Lynn, to whom builders desirous of tendering should send in their names at once.

Coming Events.

Wednesday, October 31.

ARCHITECTURAL ASSOCIATION (Discussion Section).—Mr. G. M. Nicholson, F.S.I., on "Quantities and Cost," at 7.30 p.m.

Friday, November 2.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—President's address.

ROYAL SANITARY INSTITUTE.—Dr. James Kerr, M.A., on "Physical Conditions Affecting Health in Schools," at 7 p.m.

JUNIOR INSTITUTION OF ENGINEERS.—Presidential address by Mr. William B. Bryan, M.I.C.E., on "Water Supply" at 8 p.m.

ARCHITECTURAL ASSOCIATION.—Mr. Hugh Stannus on "The Corinthian Order," at 7.30 p.m.

GLASGOW TECHNICAL COLLEGE ARCHITECTURAL CRAFTSMEN'S SOCIETY.—Prof. Charles Gourlay on "The Byzantine Churches of Constantinople," at 8 p.m.

Saturday, November 3.

INCORPORATED BRITISH INSTITUTE OF CERTIFIED CARPENTERS.—Visit to Victoria Station Extension Works, at 10.30 a.m. Visit to new Annexe to Grosvenor Hotel, at 2.30 p.m. Monthly meeting at Carpenters' Hall, at 6.30 p.m.

Monday, November 5.

LIVERPOOL ARCHITECTURAL SOCIETY.—Mr. Walter Cave on "Fenestration."

ROYAL INSTITUTE OF BRITISH ARCHITECTS—Presidential address by Mr. T. E. Collcutt at 8 p.m.

New London Buildings

At yesterday's meeting of the London County Council the Building Act Committee reported the following applications under the London Building Act, 1894, their recommendations as to consent or refusal being appended in *italics*:

Formation of certain new streets for carriage traffic on the Streatham Lodge estate, Streatham Common (south), Wandsworth. (*Modification of resolution.*)

Angle turret to a proposed building at the corner of Melbury Road and Holland Park Road, Kensington, on the application of C. J. C. Pawley. (*Consent.*)

Projecting balcony in front of a proposed block of buildings between Nos. 18 and 20, Cavendish Square, St. Marylebone, on the application of Gilbert & Constanduros. (*Consent.*)

Two bay windows in front of No. 11, Grafton Street, Old Bond Street, on the application of W. Woodward, on behalf of B. Quaritch. (*Consent.*)

Stone balcony in front of No. 13, New Burlington Street, Regent Street, on the application of A. E. Hughes and Son, on behalf of D. C. Apperly. (*Consent*).

Wooden balconies in front of Nos. 16 and 17, Glenesk Road, Eltham, on the application of D. Warry, on behalf of G. Van Gyseghem and himself. (*Consent.*)

Bay windows to seven houses upon the southern side of Godfrey Hill, Woolwich, between Godfrey Street and Lower Wood Street, on the application of S. A. Douglass. (*Consent.*)

One-storey building at the flank of No. 296, Queen's Road, Deptford, to abut upon Erlanger Road, on the application of A. D. Johnson, on behalf of M. H. Glover. (*Refusal.*)

Two houses on the northern side and two houses on the southern side of Bargery Road, and two houses on the northern side of Inchmery Road, Catford, with the flanks of three of such houses abutting upon Penerley Road, on the application of Norfolk & Prior, on behalf of J. Watt. (*Refusal.*)

Building on the south-western side of Thornsbeach Road, Catford, with the flank of such building abutting upon Bargery Road, on the application of Norfolk & Prior, on behalf of J. Watt. (*Refusal.*)

Retention of a forecourt wall and the erection of a fence on the eastern side of Plassey Road, Catford, along the western side of the yard belonging to the premises marked "house and shop," the wall and fence being at less than the prescribed distance from the centre of the roadway of Plassey Road, on the application of T. Buckland. (*Consent.*)

Projecting shop front on the King Street frontage of a proposed addition to Nos. 95 and 97, High Road, Kensington, on the application of Pilditch & Co., on behalf of J. Barker & Co., Ltd. (*Refusal.*)

Building on the eastern side of Great Chapel Street, Westminster, to abut also upon Dacre Street, on the application of Griffin & Woollard, on behalf of the Westminster Trust, Ltd. (*Consent.*)

Proposed addition to Nos. 95 and 97, High Street, Kensington, to abut upon King Street and Ball Street, and to exceed in height the width of Ball Street, on the application of P. E. Pilditch, on behalf of J. Barker and Co., Ltd. (*Consent.*)

Pump-house at the Grove Road Generating Station, Grove Road, St. Marylebone, on the application of C. S. Peach, on behalf of the Central Electric Supply Co., Ltd. (*Consent.*)

The Theatres and Music Halls Committee reported the following applications:—

Drawings submitted by the Charing Cross, West End and City Electric Supply Co., Ltd., showing a proposal to fix electric heaters at the Comedy Theatre, Panton Street, Haymarket. (*Consent.*)

Drawings submitted by Joseph & Smithem, of a concert hall to be erected on the site of St. Paul's Church, Great Portland Street. Accommodation is shown for about 750 persons in the body of the hall and for about 484 in the gallery. (*Consent.*)

Drawing submitted by J. M. Klempner, of the Imperial Restaurant, No. 20. Shepherds Bush Green, with a view to obtaining a music licence for the restaurant on the ground floor. (*Consent.*)

Drawings submitted by Skewes-Cox, Nash & Co., of the Old Swan Public House, Battersea. (*Consent.*)

Drawing submitted by F. W. Hingston, showing the gates which it is proposed to fix at the east and west ends of the 20ft. passag -way at the Putney Hippodrome, Felsham Road, Putney. (*Consent.*)

Drawing submitted by R. Dawson, Ltd., showing the connections of the main switchboards and distribution boards of the electrical installation at the Putney Hippodrome, Felsham Road, Putney. (*Consent.*)

Drawings submitted by Alexander Ritchie & Co., showing the heating apparatus proposed to be installed at the Queen's Music Hall, Poplar. (*Consent.*)

Current Market Prices.

FORAGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	11	0	1	17	0
Clover, best...	per load	4	7	0	4	17	6
Hay, good	do.	4	0	0	4	5	0
Sainfoin mixture	do.	4	0	0	4	7	6
Straw...	do.	1	8	0	1	14	0

METALS.

		£	s.	d.	£	s.	d.
Standard Copper	per ton	97	0	0	98	0	0
Do. Strong sheets ...	do.	115	0	0	116	0	0
Lead, soft foreign... ...	do.	19	10	0	20	0	0
Do. English	do.	20	0	0	20	10	0
Do. pipes...	do.	22	10	0	22	15	0
Do. sheets	do.	22	0	0	22	5	0
Galvanised Corrugated sheets	do.	13	0	0	13	5	0
Spelter G.M.	do.	28	0	0	28	10	0
Angles, Scotland	do.	6	15	0	6	17	6
Bars, do.	do.	7	15	0	8	0	0
Marked bars, Staffs. ...	do.	8	7	6	8	10	0
Common bars, do. ...	do.	6	15	0	6	17	6
Angles, M'boro.	do.	6	10	0	6	12	6
Joists. M'boro	do.	6	5	0	6	10	0
Angles, Midlands	do.	6	15	0	6	17	6
Joists do.	do.	6	17	6	7	0	0
Girder plates, Midlands ...	do.	7	10	0	7	12	6
Angles, Foreign, c.i.f. Thames	per ton	6	15	0	6	17	6
Tees do. do. do.	do.	6	17	6	7	0	0
Joists, do. do. do.	do.	6	5	0	6	7	6
Channels do. do. do.	do.	6	10	6	6	12	6
Plates do. do. do.	do.	7	5	0	7	7	6
Tin, Foreign	do.	197	0	0	198	0	0
Do. English ingots ...	do.	197	0	0	198	0	0
Zinc, sheets, Silesian, f.o.b.	do.	32	0	0	32	5	0
Do. do. V.M. do.	do.	32	5	0	32	10	0

MISCELLANEOUS.

		£	s.	d.	£	s.	d.
Bricks Stocks, d/d to job	per 1,000	1	15	0		—	
Do. Flettons on rail ...	do.	1	5	0		—	
Cement	per ton	1	12	0		—	
Lime	do.	1	4	0			
Castor Oil, French ...	per cwt.	1	9	0		—	
Colza Oil, English ...	do.	1	13	3		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	15	0	2	17	0
Lead, white, ground, carbonate	per ton	16	0	0		—	
Do. red	do.	15	0	0	19	0	0
Linseed Oil, barrels ...	per cwt.	1	0	6		—	
Petroleum, American ...	per gal.	0	0	6⅜	0	0	6½
Do. Russian ...	do.	0	0	5⅞	0	0	6⅛
Pitch	per barrel	0	9	0		—	
Shellac, orange	per cwt.	10	9	0		—	
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Town	per cwt.	1	11	6	1	12	6
Tar, Stockholm	per barrel	1	5	0		—	
Turpentine	per cwt.	2	9	0		—	

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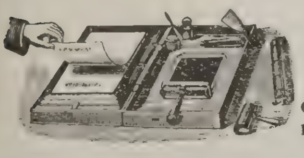

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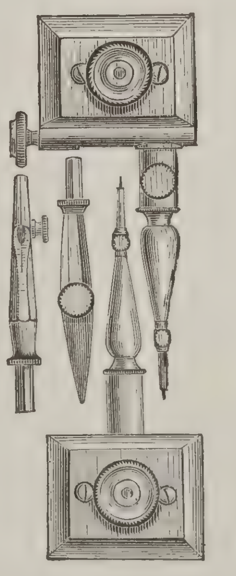

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Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, *Great New Street, Fetter Lane, E.C.*

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Brighton.—For the erection of a residence for Mr. Alfred Morris. Mr. W. C. F. Gillam, M.S.A., architect, 3, North Street Quadrant, Brighton. Quantities by Messrs. Matthews & Colman.

G. R. Lockyer	£3,160
J. Longley & Co., Crawley	3,089
Saunders Bros.	3,049
W. & A. Elliot	2,998
J. Barnes	2,993
J. H. Hackman & Co.	2,950
J. Parsons & Sons, Hove	2,940
W. Brown & Sons	2,898
G. E. Wallis & Sons, Maidstone	2,894
H. J. Penfold, Preston	2,857
W. A. Field & Co.*	2,779

[Architect's estimate, £2,850.]

* Accepted. [Rest of Brighton.]

Dewsbury.—Accepted for the erection of extensions to the infirmary at the workhouse, for the Guardians of Dewsbury Union. Messrs. Holtom & Fox, architects, Corporation Street, Dewsbury.

Masons—J. & B. Allat, Heckmondwike	£3,926	0	0
Joiners—Wilson Bros.	1,250	0	0
Plumber—F. Newsome	624	10	0
Concretor—S. Macfarlane, Leeds	309	6	11
Plasterers—A. & F. Hodgson	252	14	0
Slaters—T. Brear & Son	169	0	0
Electric lighting—Wallis & Watson, Leeds	158	10	0
Ironfounder—F. Firth	112	10	0
Painter—B. Jackson	94	0	0

Rest of Dewsbury.

Hove.—For alterations and improvements to No. 49 Brunswick Road. Mr. W. C. F. Gillam, M.S.A., architect, 3, North Street Quadrant, Brighton.

J. Parsons & Sons, Hove	£358
S. H. Diplock, Hove	357
G. R. Lockyer, Brighton	357
W. Brown & Sons, Brighton	347
Titcombe & Son,* Brighton	343

* Accepted subject to reduction.

Haslemere.—For the erection of a new shop in Lower Street for Mr. J. S. Edgeler. Mr. John H. Howard, architect and surveyor, Haslemere —

The Haslemere Builders, Ltd.	£699	10	0
Chapman, Lowry & Pattick, Ltd.	660	0	0
R. Smith*	570	0	0

*Provisionally accepted. All of Haslemere.

Hadley Wood, Middlesex.—For the erection of a residence on the Beech Hill Park Estate, for Dr. Frank Pershouse. Mr. Albert E. Kingwell, architect, 103 and 104, Cheapside, E.C. Quantities by Mr. H. J. Williams:—

Spencer, Santo, Kensington	£2,680	0	0
Parnell & Son, Rugby	2,677	0	0
Kingerlee & Son, Oxford	2,667	0	0
John Peattie, London	2,600	0	0
Foster & Dicksee, Rugby	2,589	0	0
Francis Newton, Hitchen	2,588	0	0
Leslie & Co., Kensington	2,577	0	0
Samuel Warboys, Potters Bar	2,527	10	0
Soole & Son, Richmond	2,500	0	0
W. J. Bloxham, Banbury	2,480	0	0
Chas. Gray Hill, Coventry & London	2,470	0	0
S. Dunn, London	2,337	0	0
Allan Fairhead & Son, * Enfield	2,247	0	0

* Accepted.

London.—For widening the south-western approach to Putney Bridge, for the L.C.C.:—

Greig & Matthews, Queen Victoria Street	£5,705	13	11
E. Parry & Co., Putney	5,656	7	6
J. Cochrane & Sons, Victoria Street	5,550	7	6
Perry & Co., Bow, E.	5,453	0	0
G. Hay & Co., Victoria Street, S.W.	5,233	12	4
W. Muirhead & Co., Queen Victoria Street	5,102	16	0
J. A. Ewart,* Old Queen Street, S.W.	4,926	9	5
C. A. Zadig & Co., Queen Victoria Street	4,533	11	8

* Recommended for acceptance.

London.—For cleaning and painting at the Northern Hospital, for the Metropolitan Asylums Board:—

W. H. Wagstaff & Sons, Holborn	£3,835	0	0
W. G. Ridgway, Lower Clapton Road	3,107	9	3
Skevington Bros., Derby	2,654	12	6
Gavin Bros., Wilson Street, E.C.	2,428	18	9
J. M. Turnpenny, Wood Green	2,370	12	0
J. Christie, Uxbridge Road	2,324	2	5
T. Carr, Halifax	2,165	0	0
W. Dudley, New Southgate	2,098	8	5
B. E. Nightingale, Albert Embankment	2,060	0	0
F. Smith & Co., 15, Abchurch Lane, E.C.	1,854	19	1
R. T. Burnell & Sons, New Southgate	1,829	10	7
W. Mills, Westcombe Park	1,770	0	0
E. Proctor & Son, Plumstead	1,760	0	0
R. W. Broadbank, Tottenham	1,662	14	9
M. McCarthy, Clapham Park	1,397	0	0
W. J. Sims & Sons,* 160, Derby Road, Nottingham	1,394	19	0
Wright & Co., Brixton Hill	1,288	8	6

Engineer-in-chief's estimate, £1,350.

* Recommended for acceptance.

Moreton-in-the-Marsh.—For the erection of Moreton-in-the-Marsh sewerage and sewage-disposal works. Messrs. Willcox & Raikes, engineers, 63, Temple Row, Birmingham.

Contract No. 1.

Muirhead & Co., London	£5,500	0	0
J. & T. Binns, Croydon	5,297	18	9
F. W. Trimm, Dorking	5,272	0	0
J. Roberts, Stratford-on-Avon	5,200	0	0
A. E. Nunn, London	5,055	6	9
Jones & Son, Neath	5,017	0	0
E. Tabor, Cambridge	4,941	1	0
J. Moran & Son, London	4,896	19	2
Hewett & Sons, Barking	4,768	9	7
G. Bell & Son, London	4,656	0	0
J. Riley, Cheltenham	4,634	11	8
J. Moffat, Ellesmere	4,616	16	11
Johnson Bros., Hereford	4,590	0	0
J. Hodson & Son, Nottingham	4,529	7	5
R. H. B. Neal, Ltd., Plymouth	4,406	16	3
J. A. Meredith, Cradley	4,350	0	0
J. W. Dean, London	4,325	9	8
Egan & Sons, Manningham	4,298	7	3
W. Manders, London	4,297	6	5
Chick, Carden & Co., Highworth	4,282	13	0
H. E. Buckley, Bradford	4,280	7	3
Loch, Andrew, & Price, Nottingham	4,258	17	0
A. J. Colbourne, Swindon	4,240	0	0
G. Rutter, Barry, Cardiff	4,211	0	0
Rowell & Sons, Chipping Norton	4,190	0	7
Meredith Bros., Gloucester	4,184	2	2
J. Jameson, Birmingham	4,161	0	0
J. Byard & Son, Gloucester	4,140	0	0
Braithwaite & Co., Leeds	4,032	9	9
R. C. Crawford, Uddingston	4,000	0	0
C. J. Nevitt, Stafford	3,955	10	0
W. Cunliffe, Birmingham	3,920	0	0
T. Vale & Sons, Stourport	3,883	0	0
J. H. Macdonald, Oxford	3,800	0	0
Morley & Son, Keighley	3,746	0	11
J. Owens,* Wolverhampton	3,661	12	0
W. Westwood, Bromyard	3,639	13	7

Engineer's estimate, £3,899.

* Accepted.

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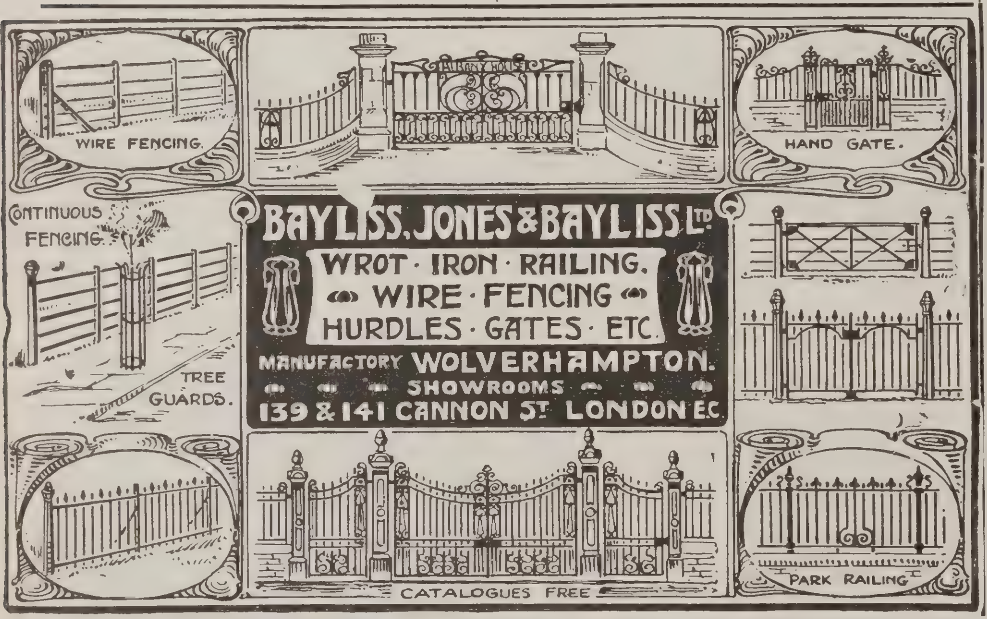
W. Manders, London	£6,134	16	9
J. & T. Binns, Croydon	6,082	16	11
F. W. Trimm, Dorking	5,975	0	0
Loch, Andrews & Price, Nottingham	5,856	7	6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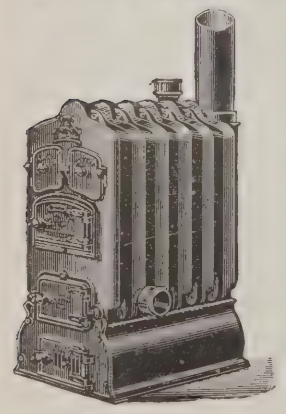
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J Moran & Son, London	5,729	4	11
Beaven & Son, Gloucester	5,645	0	0
W. H. Reading, Wolverhampton	5,600	0	0
R. H. B. Neal, Ltd., Plymouth	5,539	9	7
Streeter & Co., Godalming	5,526	7	3
G. Bell & Son, London	5,493	0	0
A. E. Nunn, London	5,477	19	4
F. Mitchell & Son, Manchester	5,460	19	9
Smith & Co., Westminster	5,444	12	10
J. A. Meredith, Cradley	5,422	0	0
W. Cunliffe, Birmingham	5,420	0	0
J. Moffat, Ellesmere	5,327	14	0
J. Riley, Cheltenham	5,283	6	0
G. Rutter, Barry, Cardiff	5,277	0	0
Johnson, Bros., Hereford	5,270	0	0
J. Byard & Son, Gloucester	5,243	0	0
Hewett & Sons, Barking	5,180	2	1
Chick, Carden & Co., Highworth	5,151	14	6
Jenkins & Son, Leamington	5,113	12	10
E. Tabor, Cambridge	5,106	0	0
A. J. Colbourne, Swindon	5,100	0	0
Jones & Son, Neath	5,054	19	0
R. C. Crawford, Uddingston	5,000	0	0
J. Jameson, Birmingham	4,999	0	0
J. Hodson & Son, Nottingham	4,991	11	8
H. E. Buckley, Bradford	4,976	10	6
J. H. Macdonald, Oxford	4,965	0	0
Rowell & Sons, Chipping Norton	4,952	5	3
G. H. Robinson, Derby	4,868	0	0
C. J. Nevitt, Stafford	4,797	13	10
J. W. Dean, London	4,775	11	7
W. Westwood, Bromyard	4,748	14	0
Meredith Bros., Gloucester	4,700	0	0
Vale & Sons, Stourport	4,646	0	0
J. G. Rutter, Washington Station	4,585	0	0
J. Owens,* Wolverhampton	4,429	3	3
Morley & Son, Keighley	4,417	5	9
Egan & Sons, Manningham	4,359	3	9

Engineer's estimate, £4,598.
*Accepted.

Plymouth.—For the erection of Prince Rock Schools:—

J. Reynolds	£20,398
Roach & Lovel	18,320
Lethbridge & Son	16,850
W. T. Stevenson & Co.	16,781
J. Paynter	16,741
Wakeham Bros.	16,508
Cockrell	16,445
Pethick Bros.	15,744
Turpin	15,657
Pearn Bros.	15,635
A. Andrews	15,450
N. E. Blake	15,448
Matcham & Co.	15,085
S. Roberts	14,843
Skinner & Co.	14,080
A. N. Coles	13,730

London, N.—For the erection of a detached house in Stormont road, Highgate. Mr, A. W. Field, A.R.I.B.A., architect, Norfolk House, Norfolk Street, Strand, W.C. Quantities by Mr. Charles A. Kennett, Hart Street, Bloomsbury:—

Edward Kerry & Son, Highgate	£2,186
Chas. E. Tucker, Muswell Hill	2,160
Parfit & Co., Harlesden	2,027
Henry Knight & Son Tottenham	1,793
W. Lawrence & Son, Tottenham	1,779
Mattock & Parsons * Gray's Inn Road	1,771

*Accepted.

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—adjudication.]

DURING THE WEEK ending October 26th twenty-four failures in the building and timber trades in England and Wales were gazetted.

J. REES, builder and contractor. R.O., Oct. 20.

HICKS & SON, builders, Bristol. R.O., Oct. 17.

W. SIGGENS, builder, Washington. R.O., Oct. 19.

J. E. HARDWICK, joiner and builder, Spital. R.O., Oct. 20.

J. LEE, mason, Shipley. P.E., Bradford C.C., Nov. 21, at 10.

M. EDWARDS, builder, Fleurdelis. P.E., Tredegar C.C., Nov. 30, at 10.45.

P. WALSH & SON, plumbers and sanitary engineers, Blackburn. R.O., Oct. 19.

W. BARNARD, timber merchant, Godstone. P.E., Croydon C.C., Nov. 7, at 11.

F. WHITEHOUSE, builder and contractor, Ipswich. P.E., Shire Hall, Ipswich, Nov. 16, at 10.30.

H. BURGESS, builder and house decorator, Ealing. P.E., Town Hall, Brentford, Nov. 13, at 11.

T. B. MONTAGUE, carpenter, Wellow. P.E., Guildhall, Bath, Nov. 22, at 11.30. R.O., Oct. 15.

J. HARLOW, builder and contractor, Burton-on-Trent. P.E.. Burton-on-Trent C.C., Nov. 14, at 12.

J. HUGHES, builder and contractor, Conway. P.E., Magistrates' room, Bangor, Nov. 1, at 12.30.

PARKINSON & SON, builders, Southall. P.E., Town Hall, Windsor, Nov. 24, at 11. R.O., Sept. 29.

HOLT & MURPHY, painters and plasterers, Bolton. P.E., Bolton C.C., Nov. 14, at 3. R.O., Oct. 15.

J. MORRIS, builder, Fulham and Pimlico. P.E., London Bankruptcy Court, Nov. 23, at 12. R.O., Oct. 18.

T. M. DE BINGHAM, engineer, London. First meeting, London Bankruptcy Court, Nov. 2. P.E., same, Nov. 28, at 12. R.O., Oct. 16.

New Companies.

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November 7, 1906. Volume 24, No. 613. 6, Great New Street, Fetter Lane, London, E.C.

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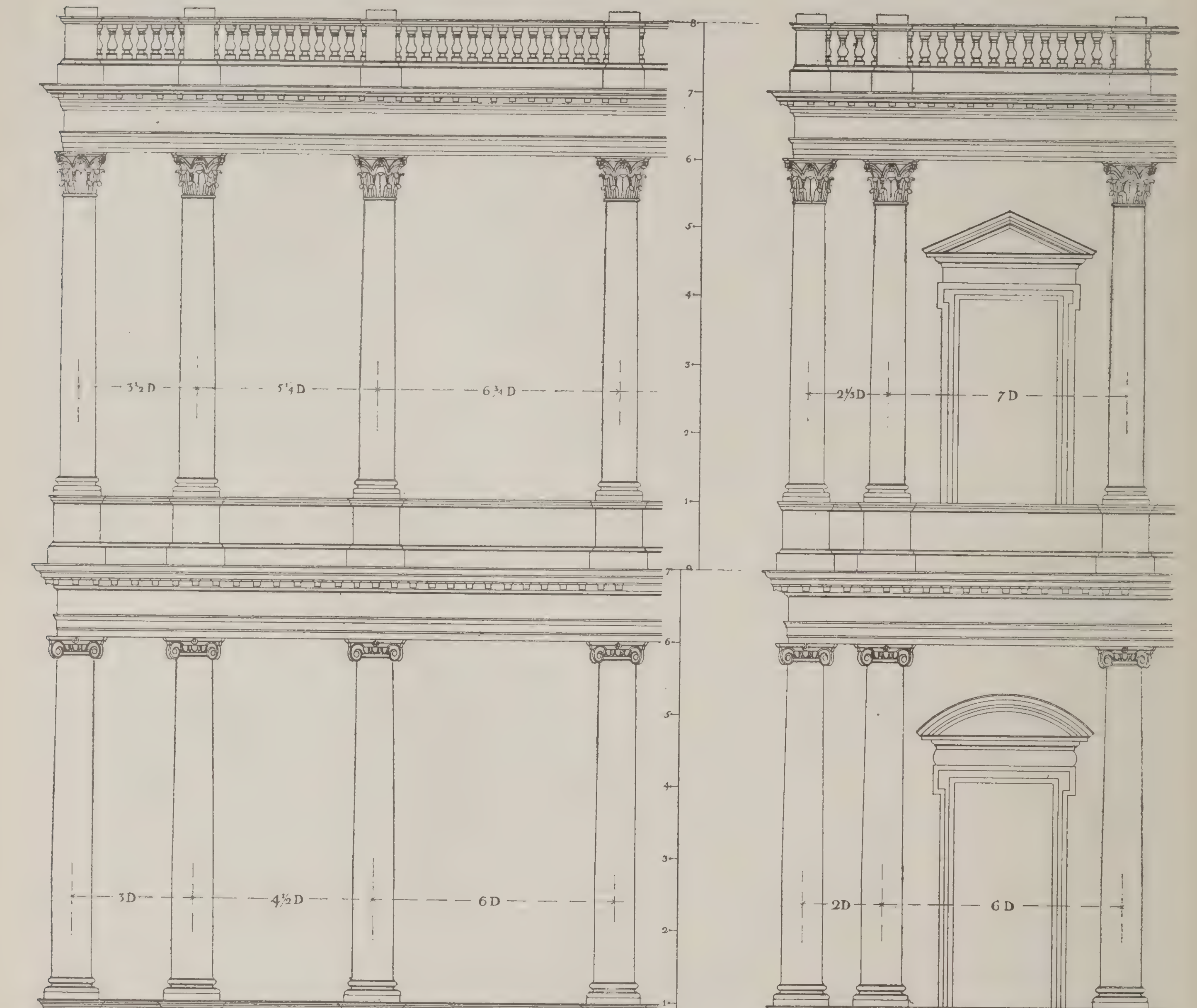
Archaeological Architecture. We are accustomed to see architecture dealt with from two standpoints, namely, the archæological and the standpoint of to-day. It is seldom that experts are authorities in both schools of thought. Not many years ago architecture was dominated by the archæological school, who endeavoured to found architectural design upon the canons of the past, and all their investigation of existing examples of ancient architecture was designed to establish such canons. We have travelled a good way since then, and although our architectural students are required to study histories of architecture (generally compiled by the aforementioned archæological purists), their chief concern now seems to be to acquire a working knowledge of building construction and of English Renaissance architecture. The study of English Gothic is confined to very narrow limits. The Italian Renaissance attracts more attention. The majority of architects in this country, however, seem chiefly to study modern work, and the perpetration of forms which are fashionable. There is very little attempt to study construction and form together, so as to trace their relation and to alter and advance on the recognised canons in view of modern constructional methods and materials. The reason for the present indifference and want of uniformity is no doubt traceable in great part to the fact that the study of ancient architecture has been left in the hands of architects largely divorced from practice and mostly interested in what might be termed pure archæology. There is a small section of the architectural public interested in such antiquarian investigation, but generally the profession remains unstirred. A very few architects have endeavoured of late to treat the history of architecture in a way more instructive to the student proposing to practice as an architect. The French may be held to have been the pioneers in this direction; Viollet le Duc and Choisy, for instance. The paper which was read before the Architectural Association last Friday by Mr. Hugh Stannus conformed to this modern method of dealing with archæological facts. He endeavoured to account for the reasons for the forms adopted by imagining the means by which building operations and architectural design would have been carried out in the days in which they were produced. Even if too great a use of the imagination may result in the production of theories that are subject to very destructive criticism, yet it undoubtedly does great service in calling the attention of architects to fundamental principles which should be studied in the use of these same forms to-day, and to features which require modification. It is very difficult for us to reconstruct the methods by which building operations were carried on in past civilisations, for so many facts are missing. The imaginative study of canonical forms, such as the Orders, therefore, very often results in details being ascribed solely to influences which are obviously minor ones, or which must have been governed to a great extent by other influences of greater or less importance. It is here where this new archæological method often fails, because the exponents are out of touch with practical construction, and betray a want of common-sense in dealing with building methods. It is plain that if any particular forms took many years to crystallise they could not have sprung into being in defiance of easier and more natural ways of meeting the requirements. The theorist either supposes ancient builders were far behind the general culture of the age in which they lived and did not know the simplest means of getting at the desired result, or else that they had a mystical knowledge of principles which we have lost, or commanded resources not at our command. Either view is extreme. It is absurd to suggest that any particular feature was designed to serve some mysterious or amateurish need.

An Edinburgh Improvement. A proposal has been made to widen Edinburgh's famous Princes Street so as to improve its appearance, and the Town Council have thought it worth while to go to some little expense in order that the public might be able to pass an opinion upon the advisability of the proposal. Consequently £50 has been spent on a model of a portion of the solid retaining wall necessary for the extended promenade. This model has been erected in Princes Street Gardens. It is made of wood and canvas, painted a light grey colour to resemble stone, and measures 24ft. to the top of the parapet. The suggested wall is divided into panels by massive pilasters 18ft. apart, and every third panel is intended to contain a shelter. The expense which the Council have incurred in erecting this model is being criticised, the opinion being expressed that a better opinion could have been obtained from a properly prepared perspective drawing, and that the incomplete model (only three bays long) neither shows how the wall is to be treated at the end, nor how entrances are to be formed. It is suggested that the proposed retaining wall is too high as viewed from the gardens, and that it could be lowered with advantage several feet by making a few steps from the present street level down to the proposed promenade, which is 45ft. wide. Indeed, by sloping the pavement from the present level several feet of this height could be saved. The cost of this proposed promenade is estimated at about £15,000. The effect of erecting such a wall would be that the green bank of ivy now existing would have to be abolished. The lower trees and shrubs on the green bank would have to be sacrificed; the upper line of the trees would be preserved and rise through gratings in the concrete. It has been suggested that if such a scheme is carried out it would be well if two semi-circular projections were formed in the wall so as to give spaces in their centres for statues, while steps would descend to the gardens on either side. Any proposal to rob space from Princes Street Gardens needs careful consideration, because the fatal error of permitting the railway to run through the centre of these gardens, and later to be widened up to the very foot of the Castle Rock, has already robbed them of most of the beauty they would otherwise have possessed.

PLATE 6

ORDER VPON ORDER & INTERCOLVMNIATIO



THE ORDERS AND THEIR APPLICATION. BY ALFRED W. S. CROSS, M.A., F.R.I.B.A., AND ALAN E. MUNBY, M.A.

PRACTICAL NOTES FOR ARCHITECTURAL DRAUGHTSMEN.

By Alfred W. S. Cross, M.A., F.R.I.B.A., and Alan E. Munby, M.A.

THE ORDERS AND THEIR APPLICATION.

(Continued from p. 200, No. 611.)

Plate VI.

When horizontal and vertical spacing have to be considered together, complications—additional to those referred to in Plate IV. on arcading—necessarily occur, and it is usually impossible, in practice, to decide the distance between columns from a purely academic point of view. The use of coupled columns is often of great assistance in difficult problems of intercolumniation, and such columns should be so spaced that their capitals are almost in contact. Columns thus arranged in pairs are also effective when placed at external angles, where they give an appearance of strength to the building and finish to the façade. The intercolumniation throughout is fixed by that adopted for the lowest Order, since the columns of the upper storeys must lie upon the same central lines. Where different Orders are used, the intercolumniation must thus vary in each storey (being based upon the diameter of the column); but, however far from the ideal the resultant spacing may be, all openings should have a greater height than width. Naturally the Tuscan should be used for the lowest storey, and the Doric, Ionic and Corinthian Orders for the upper stages of the building, whereby the composition becomes lighter in character as its height increases. If the same diameter of column be used throughout, the storeys will increase in height from the ground upwards, giving a result which is not only unsatisfactory in appearance, but incompatible with the usual horizontal accentuations of a structure. The best rule to follow is that devised by Scamozzi and adopted by Gibbs—namely, to make the upper diameter of the lowest column the lower diameter of the one next above, continuing this diminution to the top of the building.

Pedestals are most suitable for use with the Orders when they are connected by a balustrade or blocking course, or when the columns are engaged; but, as a rule, they should be avoided in the higher storeys, as they tend to produce a heavy effect; their introduction, however, is sometimes necessary, as, for instance, in cases where the distance between the floor and ceiling line makes it difficult to proportion the Orders properly by the above rule; in such cases pedestals are often found useful. It is not always possible to retain the height given for the pedestal—namely, one-fifth of the total height of the Order—when it is used in this manner. For example, the sills of windows cannot usually be well placed below the cap of the pedestal; therefore, in cases in which the rooms are to be used for ordinary domestic purposes, consideration for the comfort of the occupants of the building will usually necessitate a smaller pedestal height being adopted.

If the lowest storey of the building be rusticated, the size of the stones must be proportionate to the rest of the composition; and if a cornice crown this rusticated storey, its height should be about one eighteenth of that of the storey, while the height of the plinth terminating the base may be about one-ninth.

The height of a crowning balustrade, if used, should be one-quarter to one-third the height of the storey below, and its plinth should be increased in height in proportion to its concealment, by the top cornice, from an observer's most advantageous point of view.

When intercolumniations are wide, and when lightness is particularly required, the entablature of the Orders may be slightly reduced in height, the relative proportions of their members being still retained. It need hardly be added that these and other horizontal features, such as strings and balustrades, should be continuous throughout a façade, as otherwise the dignity, continuity and repose of the elevation may be entirely destroyed.

(To be continued.)

THE ARCHITECTURAL ASSOCIATION.

Mr. Stannus on the Corinthian Capital.

Mr. Hugh Stannus delivered a most interesting lecture on the Corinthian Capital before the Architectural Association on Friday evening last. The paper was illustrated with a large number of diagrams and lantern slides, without which we regret it is impossible to give an adequate report; but the following is an abstract:—

Mr. Stannus first defined the Corinthian Capital, showing its constructive function and its æsthetic value. In Corinthian examples the essential elements were the calyx—*i.e.*, the leaf-band at the starting—and the major cauliculus —*i.e.*, the corner-scroll under the abacus at the top. Without these a capital might be Corinthianesque or semi-Corinthian; but it could not be considered as a complete or perfect example of the style.

Mr. Stannus explained the origin of the name, it having been adopted because the ornamental parts of the early capitals were made of bronze from the ancient city of Corinthos. He then showed views of Roman remains in which the capital was bare, the ornamental leaves having been removed; and directed attention to the holes of the rivets with which they had been originally fixed.

The evolution

he traced from the Egyptian papyrus-flower capitals to a (theoretical) early example of the Aiolou type. Then, explaining his reasons for believing that the capital figured in Prof. Cockerell's book on Bassai was not a portion of the architecture of the temple, but only the capital of a statue-pedestal, he suggested the date of it as about 380 B.C., judging by the details shown in Cockerell's drawing. He demonstrated the gradual building-up of this capital with bronze scrolls and leafage-ornaments, thus proving that it was the simplest and therefore the earliest example of which there was any pictorial record; and, further, that it was undoubtedly derived from a bronze original. The date of the succeeding type, from Epidauros, he accepted as 374 B.C.; and from internal evidence he showed that it was later than the Bassai type, though containing equally strong evidence of a bronze original, and also traces of Ionian influence. The Miletos type he placed at about 360 B.C.

Mr. Stannus mentioned the Choragic-column type, which shows traces of Phœnician influence; and, further, he proceeded to explain and criticise the Lysicrates type of 335 B.C. There must have been intermediate steps between this date and the time of Antiochos IV.; but he did not know of any existing examples.

The Olympian type of 174 B.C. shows a severe and orderly arrangement of the leaves; and it was probably from some of these capitals, which were a part of the loot taken by Sulla to Rome, that the Romans derived their normal type as seen at Mars-ultor and in the Pantheon.

The Tivoli type, he considered, for historic reasons, to be about 75 B.C.; and, showing slides of several examples, he suggested that some of them were intentionally archaistic; and that there had not been any further development from that type: the Classic and Renaissance architects basing their further variations on the canonical Mars-ultor type.

Mr. Stannus then proceeded to enunciate the principles governing the design. He emphasised the importance of giving the cauliculi the appearance of growing out of the shaft and the general effect of proportion and fitness to be secured; finally commending the capital to students as a type which offered many opportunities for individual treatment.

A discussion followed, in which Mr. R. Phené Spiers, Dr. Clay, and Mr. Hugh Davies took part.

DORIC ARCHITECTURE.

In a lecture on Doric architecture at Manchester University last week Prof. Capper threw some doubts on the common theory that all the temples of the great age of Greece were built on the same plan and according to well-ascertained rule. He took as examples four or five of the finest Doric buildings of the fifth century B.C., and showed that there are many interesting differences in the planning and construction, the arrangement of the sculpture, and so on. One difficulty in the way of such enquiries was the small amount that was definitely known; for instance, of the three most perfect examples of Greek Doric in existence—the so-called Temple of Concord in Sicily, that of Neptune at Pæstum, in Italy, and the Theseum at Athens—the dates were unknown. If it could be imagined that there were only three or four specimens of 13th century Gothic architecture remaining, and those in ruins, to a Greek of the age of Pericles it might well seem that all Gothic cathedrals were built on the same plan. In the same way we, in studying the scanty remains of the great Greek temples, might hastily conclude that there was very little variety in plan. Incidentally Prof. Capper brought out the point that the temples were designed not as places of worship, but as places for the reception of statues of the gods—abodes in which the gods might dwell. The conversion of some of the temples in later times into Christian churches, while it did the good service of preserving the structures, often wrought havoc with the architecture and the internal arrangements, because the Greeks invariably built their temples with the main entrance on the east side, while the Christians unfortunately closed these apertures, and built their altars on the sites thus provided, making the entrances on the west side. It is, however, largely to its conversion into a church that the Theseum owes its wonderful preservation.

R.I.B.A.

Mr. Collcutt's Presidential Address.

The opening meeting of the session of the Royal Institute of British Architects was held on Monday evening at 9, Conduit Street, W., the chair being occupied by the new president, Mr. T. E. Collcutt.

Mr. Alexander Graham announced with regret the deaths of members of the Institute since the last session.

The secretary stated that 17 candidates presented themselves for the examinations held in London last month for qualification as district surveyor in London. The following 9 passed :—H. W. Cubitt, W. R. Davidge, P. I. Elton, H. Kenchington, G. H. Lovegrove, W. H. Rogers, H. Shepherd, W. G. Shipwright and C. B. Young.

Mr. Collcutt then delivered his presidential address. At the commencement he plunged boldly into the question of **Architects' Registration** which, he said, had brought about a crisis in their history during the past few years, and at one time had threatened to involve them in a kind of party politics. The committee which had been appointed to enquire into the matter had ended its exhaustive labours last session, and had submitted a unanimous report, which, in its general scheme, had also been adopted unanimously by the Institute. The details, however, were referred to the council, with a direction that they should draw up a scheme for revising the charter and by-laws, and also a draft bill which it was proposed to submit to Parliament. The council then appointed a committee to prepare details of the scheme. "This," said Mr. Collcutt, "they have done so far as the revision of the charter and by-laws are concerned, and their draft scheme is now under the consideration of the council. We anticipate that the revision of the charter will improve the position of the practising architect." In dwelling with equanimity on the pleasant subject of their personal welfare, however, Mr. Collcutt said they should not ignore the sad condition of many of their less prosperous brethren; a subject brought very forcibly to mind by the many lamentable cases considered at a recent meeting of **the Architects' Benevolent Society.** It was a regrettable fact that among six or seven thousand practising architects in the United Kingdom there were only 447 who subscribed to this deserving society. Mr. Collcutt urged those to subscribe who had not done so. He then went on to consider the subject of

Public Competitions.

He said: "It has recently been suggested that in competitions for buildings of any magnitude, the responsibility of selection becomes too onerous to be entrusted to one assessor, and that competitors would feel greater confidence in the judgment of two or more. I entirely disagree with this idea, and to illustrate my opinion I venture to remind you of the result of the competition for the proposed Peace Palace at the Hague. This competition being of an international character, it was decided to invite six architects, representing various countries, to act as a jury of selection. Our Foreign Office requested the Institute to nominate an architect as representative of Great Britain, and our council did me the honour to elect me to this post. During last April I met my brother assessors at the Hague, and we forthwith embarked on the work entrusted to us. Our committee consisted in all of seven assessors, the president of the Peace Congress acting as chairman and voting with the six architect jurors. In my opinion the combined efforts of the seven jurors resulted in disastrous failure. To my mind the design placed first in order of merit should not have been placed at all. The instructions to competitors issued by the Peace Committee stated the proposed limit of expenditure. Now all the assessors agreed that the cost of carrying out the selected design would be no less than double the amount specified. Nevertheless, the jury decided by a bare majority that this design should receive the first premium in virtue of the excellence of its plan. It appeared to some of us that this plan possessed undoubted merits, but that these merits existed only because the designer had utterly ignored the limitation of the proposed expenditure. He would probably be obliged to remodel his plan in order to reduce the cost to a sum approximate to that at his disposal, and the special features that had attracted the assessors would thus be either eliminated altogether or else remodelled to such an extent as to lose the characteristics which had made them specially attractive.

"With regard to deciding what style of architecture would be most suitable for a monument of international peace and harmony, the majority of the jury inclined towards the Dutch style of the sixteenth and seventeenth centuries. On the other hand, a minority was in favour of a style common in some degree to most European countries. This minority considered that an adaptation of Italian Renaissance would be more international in character and more suitable in every way than any treatment of Dutch architecture could possibly be. However, the wishes of the majority prevailed. In spite of this, the principal characteristics of the design finally chosen were those of a French *château;* but I venture to think that this style of architecture, as illustrated by the successful designer, is not quite appropriate to a public and international building.

The question of assessors requires careful consideration. Should there be one assessor or a jury of several? My experience at the Hague led me to the conviction that when more than one assessor is appointed an altogether futile conclusion is likely to be the consequence. In this case, as I have pointed out, we were six architects, with a layman as chairman. The result of our combined labour was the choice of a design which we all agreed could not be executed under double the amount quoted in the instructions to architects. The design chosen was crowded with picturesque towers, gables, and roofs, most of which were quite unnecessary. As a supplement to our report we wrote a joint letter to the permanent committee wherein we advised that the future buildings should be monumental in character and without exuberance of ornament. We suggested that such extraneous features as towers, cupolas, &c., should be considered with the utmost reserve, and in this way our previous decision was completely stultified.

"I think I have shown that the final decision was a stupendous failure. It is probable that when more than one assessor is appointed the sense of individual responsibility is lessened. Perhaps each member of such a jury undertakes his arduous task with a feeling that the final result will be more or less in the nature of a compromise. In a jury of assessors there is also the possibility of a minority report, which may lead to difficulties with the employers, and perhaps to the abandonment of the awards. To my mind **the ideal arrangement** for deciding important competitions is the appointment of one chief assessor aided by one, or preferably by two, assistant advisers to whom he could turn for counsel or help. The assistants or assistant should have no voice in the ultimate decision; the entire responsibility should rest with the chief assessor.

"Although I have shown that the Hague competition was a failure, inasmuch as the best designs were overlooked, I do not wish to infer by this that I think competitions are a mistake, and that they fail to secure the best possible designs. On the contrary, I believe that it is to the interest of the public that a competition should be instituted for every proposed public building of importance. I do not deny that there may be many exceptions to this rule. The New Scotland Yard is a notable instance of such an exception; but the architect of that noble work stands by himself, as is recognised, I think, both by the public and by the architectural profession. It is said that buildings erected from competition designs fail more or less in reaching a high standard of architecture. There is, of course, a good deal of truth in this criticism; but I think it cannot be said with any approach to truth that public buildings, where there has been no competition, reach a higher standard.

"I think, in the interests of architecture, that every means should be taken to secure the best design possible, and as a rule this can be done by competition. Competition is also invaluable to the young architect for reasons beyond that of striving for a first prize: it gives him the opportunity of comparing his work with that of others and of taking home to himself, if he is modest, his weaknesses. Beyond this there is the chance of discovering genius which otherwise might strive in vain to make itself known.

"I think it is a matter of congratulation that the London County Council have decided to institute a competition for the building of **the proposed County Hall.** But I learn with dismay that it is their intention to make it open to architects of all nations. There is no precedent for such a course; and I think a vigorous protest should be made, in the interests of both the English public and the English architect, against a course which appears to be unnecessary and unjust, and one which no other nation would think of adopting. It is no question of dislike to meet our foreign brethren in competition that prompts this protest; it is that I feel that an international competition would be a direct slight to English art, and that it is to the English architect we must look for the production of a design that will illustrate the best traditions of English work.

"I feel sure you will share my opinion that the results of recent competitions go to prove that the younger generation is fully qualified to continue that advancement in the art of architecture which we all so earnestly desire. May I none the less offer

a word of advice

to our younger students? All who have had experience in judging competitions must have been struck with the number of designs submitted by competitors who are evidently in the first stages of their studentship. Let me counsel such beginners to realise that the art of design must be carefully studied, and can be mastered only by continued practice. An important competition does not offer the requisite opportunities for the student to learn his craft."

Having thus considered the subject of competitions at length, Mr. Collcutt went on to refer to the International Congress of Architects, held in London last July, and selected one of the subjects then dealt with as a theme for some personal views. This subject was

The Education of the Public.

A passage in Ruskin's "Stones of Venice" bore very directly on this question. (It had been said, Mr. Collcutt observed, that there were two classes of admirers of Ruskin—namely (1) those who believed in him as an art exponent, but thought him entirely ignorant of political economy; and (2) those who believed him to be a political economist, but declared he knew nothing of art.) However, Ruskin had said: "Every man has at some time of his life personal interest in architecture. He has influence on the design of some public building; or he has to buy and build his own house. It signifies less whether the knowledge of other arts be general or not: men may live without buying pictures or statues; but in architecture all must in some way commit themselves; they *must* do mischief and waste their money if they do not know how to turn it to account. And it is assuredly intended that all of us should have knowledge, in matters with which we are daily concerned, and not be left to the caprice of architects or mercy of contractors." Caprice of architects! Of course that might have been true fifty years ago, but now it was absurd!

The Grand Tour.

It might be taken for granted that public taste in painting and sculpture had developed during the last generation; but, notwithstanding the advice of Ruskin, it did not seem that there had been such an awakening of public interest in architecture. It was certain that the average cultured Englishman of to-day showed no such appreciation of architecture as did his predecessors. Our ancestors sought culture in the fine arts largely through the study of literature, but more through home and foreign travel. Undoubtedly far greater numbers travelled nowadays; but education in the arts was not really furthered by hurried visits to buildings and galleries, "Baedeker" and "Murray" in hand. In the olden times the Grand Tour was considered a necessity for every cultured gentleman, and had a lasting influence on English style.

An Architectural Tribunal.

"A question of paramount interest, not only to this Institute, but to the public generally, relates to the control over architectural schemes in connection with the laying-out of new streets and the erection of public buildings. This question has constantly been before this Institute, and a variety of suggestions have been made, some advocating a tribunal of art, others an advisory board, working in conjunction with H.M. Office of Works.

"I believe the present First Commissioner has instituted some kind of advisory body for the purpose of dealing with the Government offices now in progress of building; but this is only a temporary arrangement. The matter is of such universal importance, and the question of want of intelligent control over public undertakings so often arises, that one cannot but feel that this Institute should give special attention to the subject.

"An architectural tribunal might become an influence in dealing with subjects not directly connected with street improvements or the erection of public buildings. For instance, there is one question suggested by our Arts Committee on which they have reported—namely the possible substitution of stone for the present wooden pediment and dome crowning the river façade of Somerset House. It is impossible to conceive that Sir William Chambers would have erected a wooden structure where stone was so obviously the material that should be employed, had not the exigencies of the plan precluded the use of the heavier material. But in this age of steel it would be a comparatively easy and inexpensive matter to add steel stanchions and girders to the interior of the building, and to erect thereon a stone dome. This would only involve trifling alterations to the rooms under the dome. This suggestion may be criticised on the ground that it is not true construction to erect a stone dome on steel stanchions and girders. But I believe that in Sir William Chambers's time, and since, the present dome was painted to look like stone; and this was surely more in the nature of a sham than the proposal now laid before you."

Mr. Collcutt then referred to the lack of appreciation for art, which resulted in buildings seldom being thoroughly completed, instancing the Victoria Memorial in St. James's Park, which, he feared, would be mutilated from lack of funds, and the Stone Arcade, a feature which of all others was the one necessary to complete and give full effect to a work worthy of the nation, eliminated.

Planning of Thoroughfares

On the subject of the Report of the Royal Commission on the Traffic of London Streets, he thought that the Institute should endeavour to make itself distinctly audible when any scheme which dealt with London streets was being considered. Many architects had made a study of this question, but the general public seemed to regard it with indifference, and the consutution of the L.C.C. did not always enable it to take the broadest and most statesmanlike view of such matters. For instance, in laying out the Aldwych site the L.C.C. had certainly failed to procure the finest view of those great features, the Churches of St. Mary and St. Clement Danes, although at the instance of the Institute some improvements were made to the original plans. In the present construction of the County Council expert qualification was not a necessary factor. Councillors and aldermen were not elected in virtue of any special knowledge.

Removal of Charing Cross Railway Station.

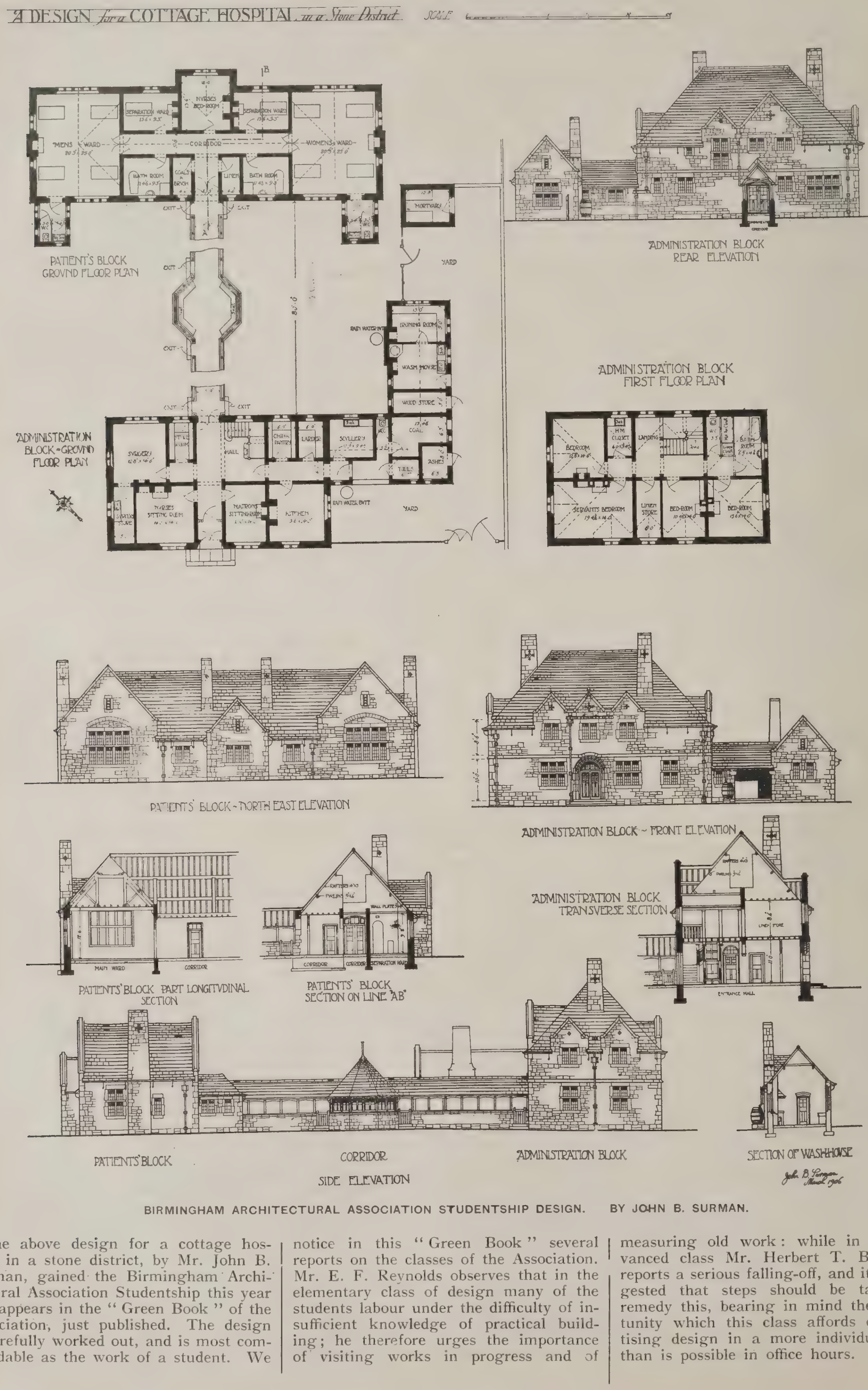
In connection with this question of improvements in thoroughfares, he referred to the collapse of the Charing Cross Station roof. When this disaster took place it was immediately suggested that a new terminus might be erected on the south of the river. The present space occupied by the station and hotel was of such enormous value that the railway company, had they adopted the scheme, would have been but little out of pocket. The gain to the public would have been a new bridge for foot passengers and for wheeled traffic. There could be no doubt that a bridge at this point was much needed, Waterloo Bridge being about 700 yards to the east, and Westminster about 1,200 yards to the south.

He believed the directors of the company fully recognised that a terminus on the south side would have been a great improvement from the point of view of the railway requirements. The vast amount of traffic could have been dealt with more easily. The chief argument that could be urged against the removal of the station was the serious objection that the public would certainly make to crossing the river by an open bridge, exposed to all weathers, instead of entering the station by its present easy access. This objection, in addition to the greater distance of the terminus from the City and West End, might have materially affected the suburban traffic, and it probably decided the directors of the company to remodel their terminus on the original site. But it was quite possible that an opposite decision might have been arrived at could it have been shown that a bridge was not necessarily an open structure.

Mr. Collcutt concluded by hoping that such questions as the Education of the Public and the appointing of an Art Tribunal were within the range of practical politics. It might be assumed that the important question of the higher Education in Architecture which would be open to the student was attracting the attention it deserved, and we might anticipate that in the near future a complete scheme would be developed. The rising generation of architects had given substantial proof of a vital desire to improve and ennoble their art, and he sincerely believed that their earnest endeavours would result in fine achievements, and that they would leave noble memorials of 20th century work, comparable, if not equal, to that of our forefathers.

Sir H. Trueman Wood, in proposing a vote of thanks to the president for his address, mentioned that it was just 27 years ago that he had the pleasure of intimating to Mr. Collcutt that the *Grand Prix* at the Paris Exhibition had been awarded to him for his design for the Imperial Institute—an honour to be counted greater then than now, because though the French were willing to admit our superiority in matters of machinery, they were not disposed to admit artistic ability in an Englishman.

Sir Aston Webb, who seconded the vote of thanks, also gave a retrospect, mentioning how thirty years ago he, with Mr. Collcutt and other enthusiasts, pledged themselves not to take part in any competition unless there was an assessor. Under the ægis of Mr. Street a memorial was presented and signed by architects in general, and with good results. Sir Aston Webb touched on many other matters, stating, in connection with the Queen Victoria Memorial, that by next spring it was hoped the hoarding round the memorial would be removed and Mr. Brock's fountains and other work disclosed.



BIRMINGHAM ARCHITECTURAL ASSOCIATION STUDENTSHIP DESIGN. BY JOHN B. SURMAN.

The above design for a cottage hospital in a stone district, by Mr. John B. Surman, gained the Birmingham Architectural Association Studentship this year and appears in the "Green Book" of the Association, just published. The design is carefully worked out, and is most commendable as the work of a student. We notice in this "Green Book" several reports on the classes of the Association. Mr. E. F. Reynolds observes that in the elementary class of design many of the students labour under the difficulty of insufficient knowledge of practical building; he therefore urges the importance of visiting works in progress and of measuring old work: while in the advanced class Mr. Herbert T. Buckland reports a serious falling-off, and it is suggested that steps should be taken to remedy this, bearing in mind the opportunity which this class affords of practising design in a more individual way than is possible in office hours.

Notes on Competitions

The task of the competition reformer as he marches along the path of endeavour, armed with the cudgel of reproof and harassed by the beasts Ignorance, Ineptitude, Inconsideration and other species, common or rare, which beset his way, is no light one. The cudgel is wielded, and a monster despatched only to reappear at no short distance. Cries for help are raised to those with greater strength and better armed. But the mighty sit lethargic, heeding appeals with scorn, safe within their fence of privilege, making no movement, save now and then the feeble hurling of an inoffensive missile. An annoyance much to the front just now is the withholding of conditions from all except those who are willing to purchase without previously examining them. The attitude of promoters in this respect is typified by the silence with which a communication of a certain body, noted for its zeal, has been received. The communication was made on behalf of architects who desired to obtain some knowledge of the nature of certain conditions, but who did not wish to risk a rather large deposit, which might not be returnable in the event of their deciding not to submit a design. A loan of the conditions was requested in order that brief information upon their nature might be disseminated. It was pointed out that this would enable intending competitors to decide definitely whether they would compete or not, and that affirmative decisions would be followed, in due course, by applications for the conditions and remittances of the required deposits. This reasonable and polite request was made on the 23rd October. No acknowledgment or reply of any sort has been received. It may not be a breach of confidence to mention that the case is that of the secondary school at Goole. The deposit required for conditions is two guineas. The refusal of the authorities at Sunderland to part with the conditions for the children's hospital, under similar circumstances, was mentioned last week. Birmingham adopted the same course with the Council House extension some time ago. Many other instances will occur to competing architects. What is the remedy? It is useless to hope for concerted action on the part of competitors; the apparent apathy of the majority is too marked for this. The enlightened minority are, by reason of their numerical weakness, unable to effect more than an occasional victory. The persistence of their endeavour may tell in the long run, but, in the meantime, the evil will continue. The subject has been brought before the R.I.B.A. more than once. Their disregard of appeal, their callousness of the convenience of their younger members who lack guineas, and their indifference to a ridiculous imposition may all be gathered from conditions which have from time to time emanated from the hands of assessors nominated by them, conditions unobtainable by other means than purchase, without reservation. It is but fair to acknowledge that conditions issued under the auspices of the R.I.B.A. are, in most respects, reasonable. The point in question is one which might easily be overlooked. It is only by persisting in its recognition that the inclusion of a not unprecedented clause may ultimately be recognised as essential.

Children's Hospital, Sunderland.

The promoters of this competition have responded in some measure to the appeal made for the lightening of onerous conditions which were commented upon in these columns last week. Most satisfactory is the announcement that it is intended to ask the assistance of the R.I.B.A. in the appointing of an assessor, who will award the premiums offered. If the assessor thus appointed possesses a full knowledge of the vagaries of conditions and of the nature of his office, the result should be (1) an ascertaining of the sufficiency of the stipulated cost of the buildings; (2) an undertaking that the author of the first premiated design should be entrusted with the work; (3) a recognition of a safety margin of cost. The last contingency has been met by the promoters themselves, who have stated to an enquirer that the clause as it stands—that all designs will be rejected which exceed the limit of cost—is merely a safeguard to the committee, and that they regard it as inconceivable that a plan, otherwise suitable, should be rejected, if the cost exceeds the estimate by more than five per cent. This is evidence of a more reasonable attitude than it was possible to ascertain from a mere perusal of the conditions.

A Glasgow Building Estate.

We referred last week to the unsatisfactory conditions of the competition of the Corporation of Glasgow for the layout of its estate at Riddrie. The Glasgow Institute of Architects has now taken up the cudgels. The Institute has addressed a letter to the Town Clerk expressing the opinion (1) that the premiums offered (£75, £50 and £25) are inadequate, while no guarantee of employment is given; (2) that there should be an independent assessor to advise the Committee; (3) that the plan of the site supplied to competitors does not give any levels, nor the necessary information for laying-out roads and forming sewers; and (4) that there is no indication given of what drawings are required, and the scale they are to be.

Edmonton Infirmary.

The Edmonton Board of Guardians has selected Mr. Rowland Plumbe, F.R.I.B.A., to assess the competitive designs for its new infirmary, which are to be invited from Mr. Stuart Hill, Mr. W. H. Ward, Mr. Marcus Collins, Mr. A. E. Pridmore and Mr. W. A. Pite. The building is estimated to cost £200,000.

Convalescent and Nurses' Home, Glossop.

In this competition the design placed first by the assessor is that of Messrs. Bulman & Vinycomb, 67 and 69, Chancery Lane, London; second, Mr. Basil C. Deacon, 8, Finsbury Terrace, Swansea; third, Messrs. Woodhouse, Corbett & Dean, 100, King Street, Manchester. Ninety-six sets of designs were submitted. The assessor says :—"Generally these are of an excellent character, and the aggregate actual expenditure in connection with the preparation of these designs, leaving out of consideration the time of the principal, must have been about £1,000. In the majority of cases the schemes submitted by the competitors could not, in my opinion, be executed for the amount proposed to be expended. Many competitors have placed the principal and minor administration entrances on the same front as the patients' garden, thereby destroying its privacy and quietness. I need hardly remind the committee that many of the drawings, perspectives in particular, convey a false impression of how a building would look if erected in accordance with such drawings."

Library, Museum and Art Gallery at Plymouth.

The instructions to architects drawn up by the assessor (Mr. Henry T. Hare) in regard to the competition among local architects for the free library and the museum and art gallery proposed to be erected in Tavistock Road, Plymouth, have been approved by the Museum and Art Gallery Committee. As the Free Library Committee have already confirmed the instructions, the preliminaries to the competition have now been disposed of, and architects who intend competing are now in a position to know exactly what is required of them. Although the two schemes are distinct, and on a different basis, designs are to permit of the simultaneous erection of both buildings, but, at the same time, the conditions provide that the free library may be proceeded with before the museum and art gallery, if anything necessitates delay in the erection of the latter. It is estimated that a saving of about £1,500 can be effected if the two buildings are included in one contract and erected together.

Model Village, Brodsworth.

Fifteen designs have been received for the model village proposed to be erected near Brodsworth, Doncaster, by the Brodsworth Colliery Co. Provision for 500 houses is required. A premium of £100 is offered for the design placed first by the assessor.

List of Competitions Open.

Deposit for conditions given where known.

DATE OF DELIVERY	COMPETITION.
Nov. 30	LIBRARY AT NEWTON-IN-MAKERFIELD.—Cost £4,000. Particulars from C. Cole, clerk to U.D.C., Town Hall, Earlestown, Lancs. No deposit.
Dec 12	LAY-OUT OF RIDDRIE ESTATE, GLASGOW.—Premiums of £75, £50 and £25. Particulars from A. W. Myles, town clerk, City Chambers, Glasgow. No deposit.
Dec. 31	DUAL SECONDARY SCHOOL AT GOOLE.—Premiums £50 and £25. Particulars from James W. Johnson, clerk to Governors, Council Offices, Goole. Deposit £2 2s.
Dec. 31	NURSES' HOME AT GENERAL HOSPITAL, WOLVERHAMPTON.—Particulars from J. Stephen Neil, House Governor and Secretary, General Hospital, Wolverhampton. No deposit.
Dec. 31	BATHS AT ASHTON-IN-MAKERFIELD.—Limited to architects in Wigan and Leigh Poor Law Unions. Particulars from A. Sykes, clerk, Council Offices, Ashton-in-Makerfield. No deposit.
1907 Jan. 19	LIBRARY AT PLYMOUTH.—Premiums £50, £30 and £20. MUSEUM AND ART GALLERY AT PLYMOUTH. Premiums £25, £20 and £10. Limited to local architects. Particulars from Borough Librarian, Plymouth
Feb. 1	CHILDREN'S HOSPITAL AT SUNDERLAND.—Premiums of £100, £50 and £25. Particulars from T. Robinson, secretary, Infirmary Offices, Bank Buildings, Sunderland. Deposit £1 1s.
No date.	ALTERATIONS TO UNION AND VESTRY OFFICES IN WESTBAR, SHEFFIELD. Limited to Sheffield architects. Premiums £25, £15 and £10. Particulars from A. E. Booker, clerk to Guardians, Union Offices, Westbar, Sheffield. No deposit.
No date.	BRANCH LIBRARY AT DUNFERMLINE. Particulars from Secretary, Carnegie Dunfermline Trust, St. Margaret's, Hull, Dunfermline.

Enquiries Answered.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional, or legal matters.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Cost of Country House.

EDINBURGH.—GLENEVAN writes: "I am at present getting together particulars for the building of a small country house, and would be obliged if you could give me a rough idea of the cost. The house would be situated in about one acre of ground, one mile from a main line station, and the same distance from the quarry. It is proposed to build with the local whinstone and to be rough-cast. The size of the rooms would be—dining-room 20 by 18, drawing-room 16 by 14, parlour 16 by 14, hall 18 by 16, three bedrooms 16 by 15, two bedrooms 14 by 14, bathroom 12 by 12, servants' room 14 by 14, laundry, scullery, wine cellar and lavatory in hall. Workmanship first-class throughout."

It is quite impossible to give any definite reply to your enquiry, because everything depends upon specific conditions. The house might possibly cost between £2,000 and £3,000. We recommend you to purchase "Country Cottages and Week-end Homes," just issued by Messrs. Cassell & Co., London, price 5s. nett. The book illustrates a large number of small country houses, and gives the cost of most of them.

Cesspools at Country Schools.

ST. AUSTELL. — RUSTICUS writes: "Which is the best way of emptying and cleaning cesspits used in drainage systems at small country schools? The Local Government Board insist that these be made watertight, without overflow; consequently they must be periodically cleaned out and emptied. As the solid matters would not be a large percentage of the capacity of the pit it practically resolves itself into a question of disposing (after removal from pit) of the liquid at fairly frequent intervals and cleaning solid matter out at longer intervals."

The best method of emptying a cesspool is to use one of the modern pumping apparatuses. In this arrangement the sewage is pumped direct from the cesspool into a barrow or cart and taken away. This apparatus is manufactured by several makers, of which Merryweather is one. The same thing, however, can be done with an ordinary portable diaphragm pump and an old water barrel, sufficient hose being provided to connect up between the pump and the cesspool and the pump and the cart.

By-laws as to Piggeries.

LANCS.—A.S. writes: "Is it in the power of an urban district council, whose present by-laws provide that no piggeries shall be at a less distance than 60ft. from the nearest dwelling, to adopt new by-laws limiting the number of pigs to be kept at a distance of 100ft. to 3, and at 200ft. to 6, and at 300ft. to 20 pigs, making the new by-laws to act retrospectively?"

An urban district council is quite within its powers in making such a by-law as that suggested in this case, but before it can be enforced it must be first submitted to the Local Government Board and must be confirmed by them (section 184, Public Health Act, 1875). I have never known any by-law to be retrospective, and do not think the Local Government Board would approve of such a proposal. One could never tell where the mischief would stop. F.S.I.

Bending Moments on Continuous Girder.

CARLISLE.—S. L. writes: "In designing a continuous girder over four supports, subject to an evenly-distributed load, it is the most economical plan to make the two end spans four-fifths of the centre span. Please give formula for the maximum bending moments under this condition. Take for instance a girder as sketch stressed with 1 ton per foot run. What are the reactions of each support? What effect would be caused by any one of the spans being freed from its load? What is approximately the minimum depth of girder over span that should be used?"

The proportion of spans and nature of loading are shown in Fig. 1. Fig. 2 shows the corresponding bending moment diagram with the formulæ for the ordinates. The shearing force diagram is shown in Fig. 3, and is obtained as follows:—Let ABCD be the girder with two intermediate supports B and C. from points B and C set up BE and $CF=\frac{13wl}{32}+\frac{L^2}{3l}\left(\frac{2w}{7}\right)$ where $L=\underline{l+l'}.$ Make BG and CH each$=\frac{wl}{2}$ and join G and H to mid-span J. Draw EK and FK parallel to GJ and HJ respectively. For the end spans erect $BL=\frac{2wl'}{3}$ and at A erect $AM=\frac{1}{2}BL$. Join M and G to P, distant $\frac{1}{3}l'$ from A. Make $AN=\frac{wl'}{2}-\frac{3wl^2}{32l'}$. Draw NO and LO parallel to MP and GP respectively, giving the shear diagram as shown by ordinates. The reactions may be obtained from the shear diagram thus:—Assuming the reactions to be equal to the shear at the supports the reaction at

$$A=AN=\frac{wl'}{2}-\frac{3wl^2}{32l'}=\frac{1\times16}{2}-\frac{3\times1\times20^2}{32\times16}=$$

6.83 tons. Reaction at

$$B=2BE=2\left\{\frac{13wl}{32}+\frac{L^2}{3l}\left(\frac{2w}{7}\right)\right\}$$

$$=2\left\{\frac{13\times1\times20}{32}+\frac{(16+20)^2}{3\times20\times}\left(\frac{2\times1}{7}\right)\right\}22.4$$

tons, but it will be sufficient if the reactions are taken as $\frac{1}{10}W$ at A=5.2 tons, and $\frac{4}{10}W$ at B=20.8 tons, where W= total load. Fig. 4 shows the bending moment diagram with the end spans carrying no load except their own weight of w' tons per foot run, and Fig. 5 shows the bending moment diagram with the middle span only unloaded. The depth of a girder is regulated partly by the stresses to be met. For a continuous girder about $\frac{1}{15}$ to $\frac{1}{18}$ of the span would be suitable. HENRY ADAMS.

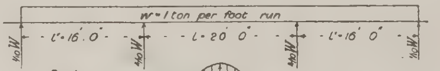


Fig 1

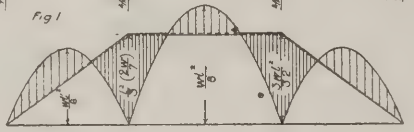


Fig 2

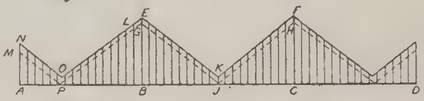


Fig 3

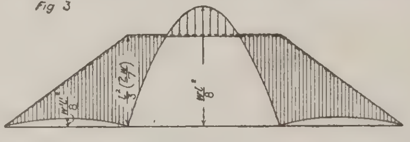


Fig. 4

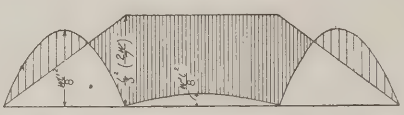


Fig 5

Strength of Brick Piers.

MANCHESTER.—N. F. S. writes: "On what basis do you calculate the strength of brickwork in deciding what size a detached pier shall be to carry a certain weight? What allowance is made for the height of piers? What factor of safety is adopted for detached piers?"

The strength of brickwork is usually calculated at a given working stress per square foot, or at a certain proportion of the first fracture stress. For example:—

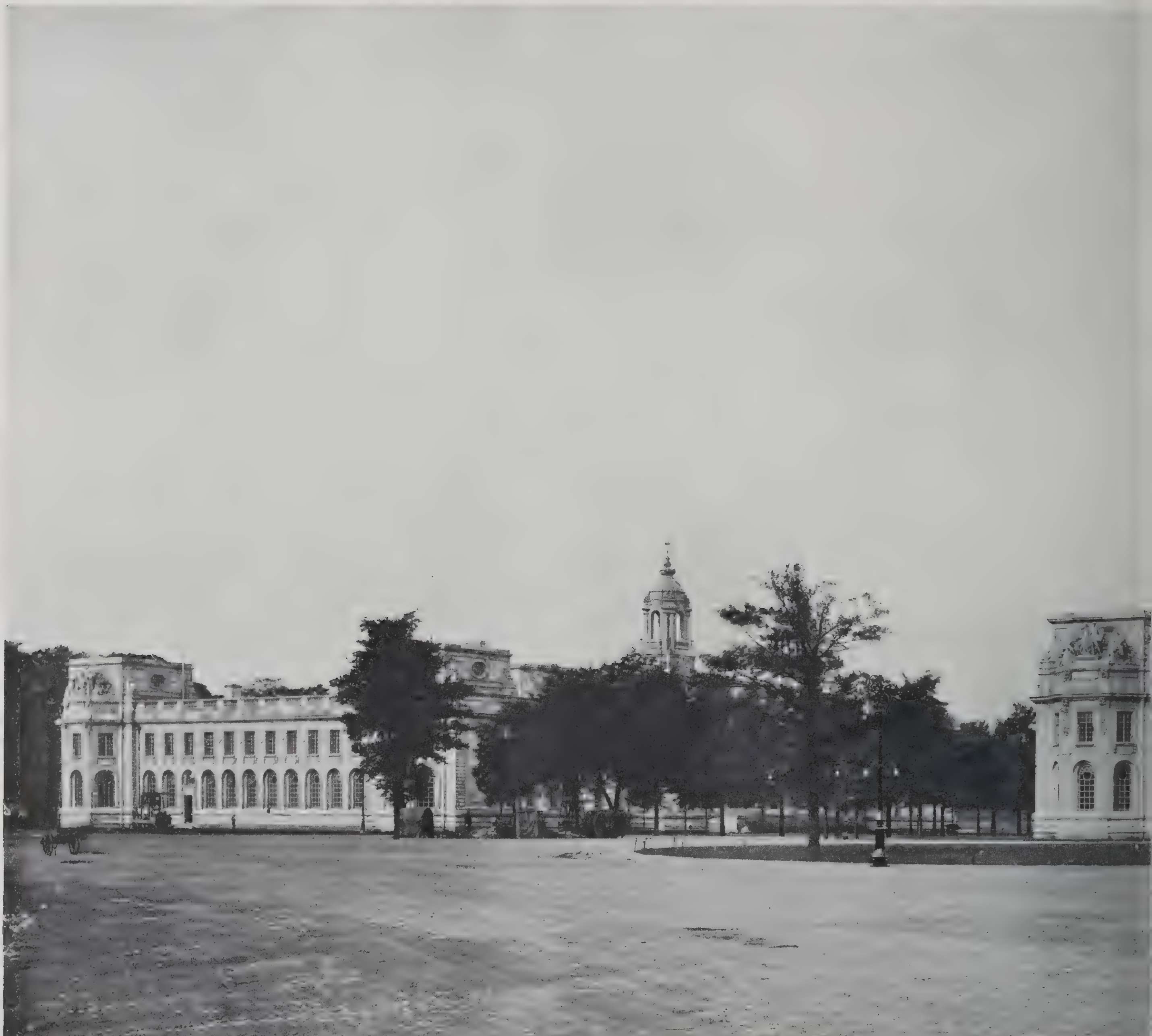
Material.	Safe load tons per sq. ft.	Proportion of first fracture load.
Blue brick in cement	9	$\frac{1}{8}$
Stock brick in cement ...	6	$\frac{1}{5}$
Stock brick in lias mortar ...	5	$\frac{1}{4}$
Stock brick in grey lime mortar	3	$\frac{1}{4}$
Portland cement concrete (6 to 1)	5	$\frac{1}{8}$
Lias lime concrete (4 to 1) ...	3	$\frac{1}{6}$

These are the loads at the lowest points—*i.e.*, including the weight of the structure itself. Where dead loads only are to be carried, and the work is constructed under strict supervision, there would be no danger in increasing the values by 50 per cent., but it must be remembered in judging from experiments that the general minimum should be taken, not the average. It is generally considered that the loads given above may be adhered to in the case of independent piers where their height does not exceed six times their least width, and that beyond this proportion a reduction must be made. Say w=tons per sq. ft. as given above, r=ratio of height to least width, then safe load tons per sq. ft.$=w\left(\frac{24-r}{18}\right)$. If the pier is bonded to a wall, as a pilaster in the length of it, the thickness of the pier would be increased by the thickness of the wall, and the safe load would be somewhere about that due to a similar-sized independent pier of half the height: in other words, the wall may be considered to double the strength of the pier. When the pier is bonded to the end of a wall, as to the front of the party wall between adjoining shops, there is less bonding and stiffening, and a fair allowance would be to consider it as an independent pier of three-fourths the height, nothing being added for the thickness of wall. Every case must be considered on its merits; there would be no skill in designing if everything depended upon formulæ.

HENRY ADAMS.

LIBRARY
OF THE
UNIVERSITY OF ILLINOIS

Supplement to
The Builders' Journal and Architectural Engineer,
Wednesday, November 7th, 1906.



NEW CITY HALL AND LAW COURTS, CATHAYS PARK,

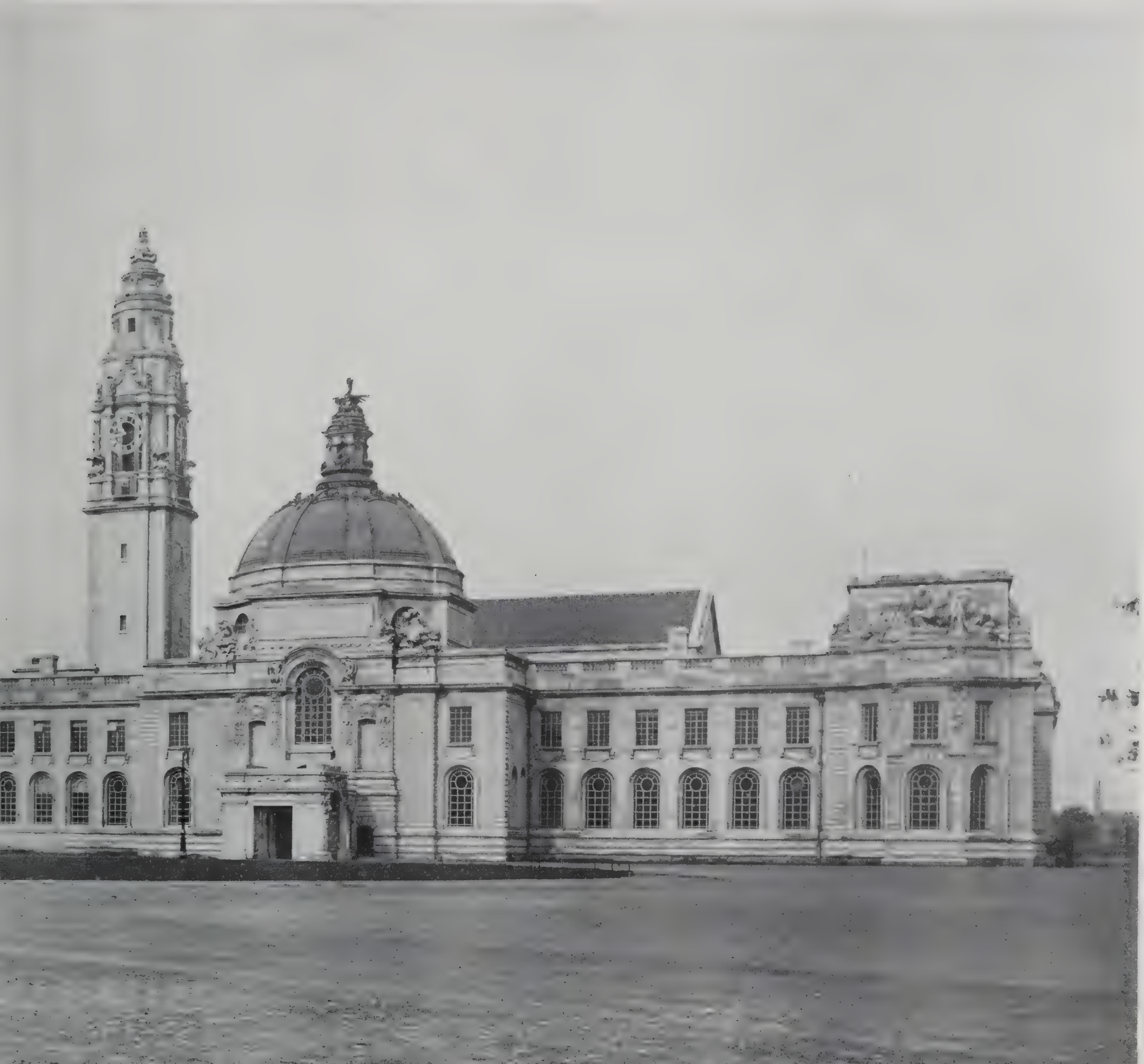


Photo: Thomas Lewis, Birmingham.

FF. LANCHESTER AND RICKARDS ARCHITECTS.

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Notes and News

A New Lancashire Asylum is proposed to be built at Whalley.

"Baronial" Villas Compulsory.—The Marquis of Bute stipulates that new villas on his estate at Bute must be in the "Scotch baronial" style.

At the Leys School, Cambridge, a new chapel in memory of the late Rev. W. F. Moulton, D.D., first headmaster, has been completed at a cost of about £8,000. Mr. Robert Curwen was the architect.

Messrs. Doulton & Co., Ltd., have been awarded a Diploma of Honour and the Grand Prix at the Milan Exhibition in the Hygienic Section for sanitary appliances.

Mr. T. H. Batstone desires to make it generally known that he has no connection with any other firm but Messrs. Aldam Heaton & Co., Ltd., interior and ecclesiastical decorators, 28 & 29, Baker Street, Portman Square, London, W.

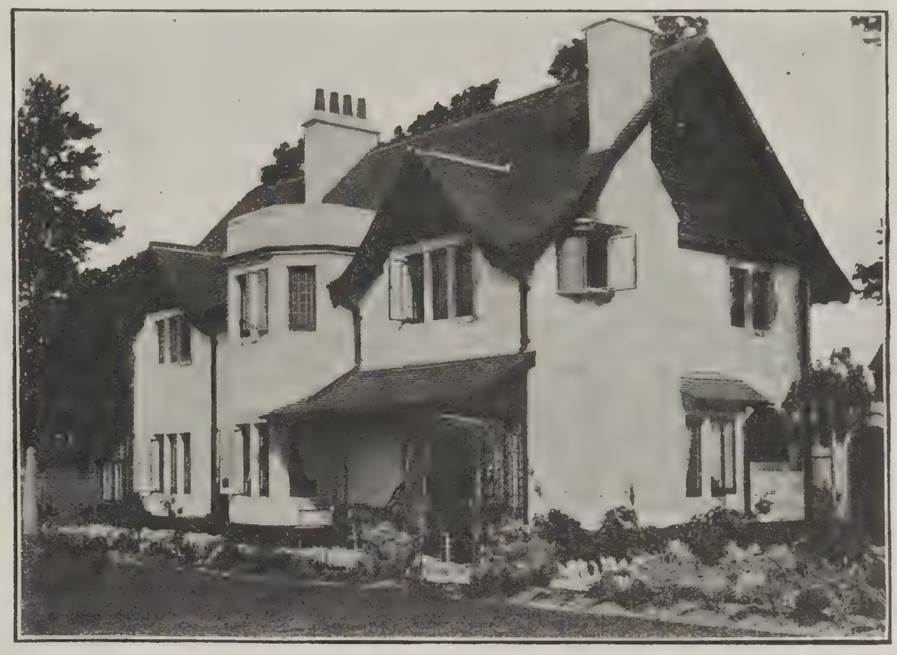
The Auld Brig of Ayr is to be put into a state of good repair at once. The work will be carried out by Messrs. Simpson & Wilson, civil engineers, of Glasgow, in conjunction with an archæological expert.

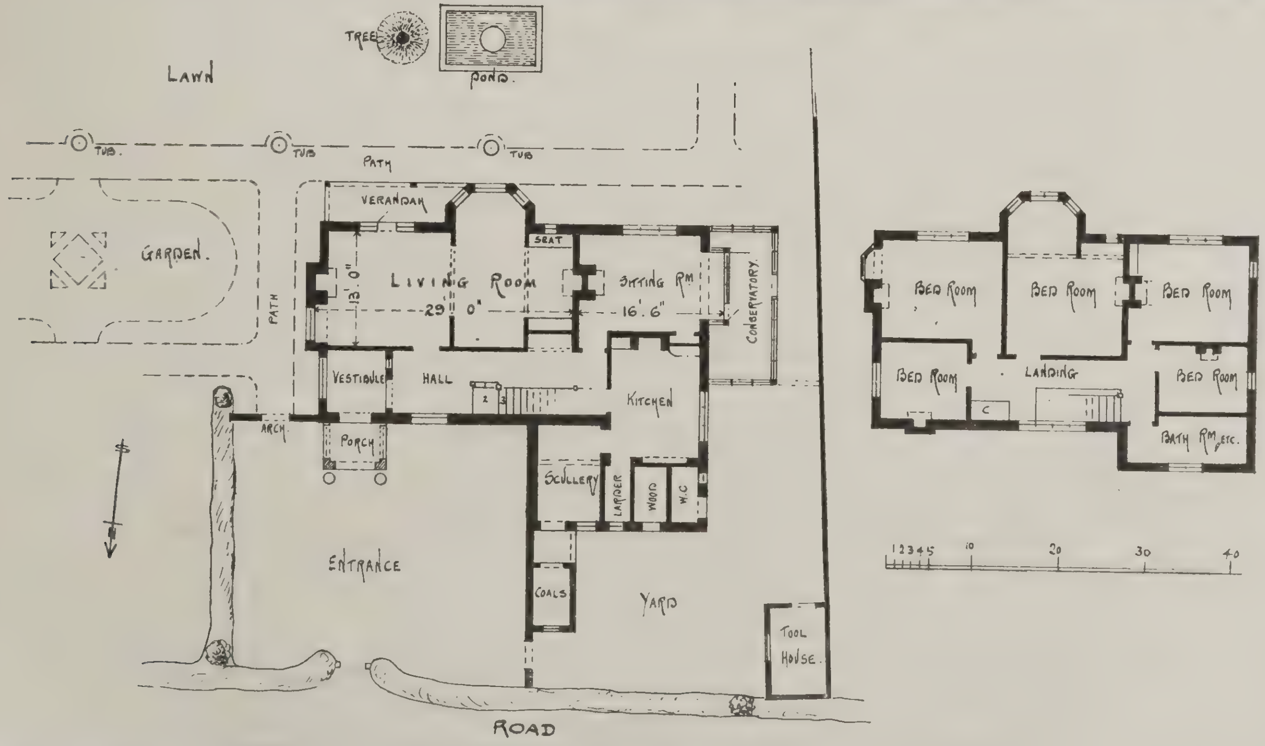
New Buildings at University College, Reading, have just been completed at a cost of £50,000. The architects were Mr. W. Ravenscroft, F.R.I.B.A., and Mr. C. S. Smith, F.R.I.B.A., of Reading, and the builders were Messrs. Kingerlee, of Oxford.

The Restoration of Tintern Abbey.—Considerable progress has been made with the work of restoring and preserving Tintern Abbey, now Crown property. During the past twelve months the resetting of the centre mullion and what remains of the tracery in the great east window has been completed, and the walls have been repaired. Much work remains to be done, especially in connection with the eastern arch of the tower and with the north transept.

Glasgow Architects.—Mr. James Lochhead, A.R.I.B.A., delivered his presidential address to the Glasgow Architectural Association last week. He laid stress on the necessity for a thorough understanding and collaboration, not only between architects and contractors, but between architects themselves: he also dealt with the regrettable state of public opinion in regard to architecture, and expressed the wish that the general press might bestow on the efforts of the architect a little of that interest which was lavished on sculptors, musicians and painters. At the close of his address he referred to the projected amalgamation of the Association with the Glasgow Institute of Architects. This matter was also referred to at the quarterly meeting of the Glasgow Institute held last week, when the recommendation of the Council to proceed with the amalgamation was unanimously approved.

The Mall Improvement.—The fine processional road constituting the remodelled Mall in St. James's Park has been completed for some time, and work is now in progress at the eastern end, where an opening has been made into Charing Cross. At this end there will be a triple archway, with buildings on either side (to be occupied by the Admiralty), and it is hoped that the scheme will be completed by 1908. Sir Aston Webb is the architect. On the footway near the arch there will be some fine new lamps, which have been designed by Mr. Brock, R.A., who also, of course, is the sculptor for the National Memorial to Queen Victoria, now in course of erection at the western





HOUSE AT LITTLEHAM CROSS, NEAR EXMOUTH. ERNEST E. ELLIS, ARCHITECT.

This house is on the estate of the Hon. Mark Rolles. Walls are cement rough-cast, finished white, with Bath stone dressings to windows; roofs of red Bridgwater tiles; weather boarding in gables. Mr. Ernest E. Ellis, of Exmouth, was the architect.

end of the Mall, in front of Buckingham Palace. The new gates in front of the Palace are very fine examples of beaten ironwork. They have been made by the Bromsgrove Guild. Opposite the Duke of York's steps will be placed the Royal Artillery South African memorial.

Obituary

Mr. Jonathan Skippen, Yarmouth's oldest builder, died recently, aged 77.

Mr. George Clark, builder and timber merchant, Stroud, died recently, aged 80.

The late Mr. J. T. Micklethwaite, F.S.A., architect and surveyor to the Dean and Chapter of Westminster, who died on Sunday week last, was buried in the Abbey on Wednesday. He will be long remembered as an able and experienced architect, with a wide learning as an antiquary and an archæologist. In knowledge of the Abbey Mr. Micklethwaite had no rival, save Thomas Wright, clerk of works, who died some months ago. Mr. Micklethwaite was born in 1843, and educated at King's College, London. He was articled to Sir Gilbert Scott in 1862, and commenced work as an architect seven years later. He was appointed architect to Westminster Abbey in 1898. In 1870 he was elected a fellow of the Society of Antiquaries. He was author of "Modern Parish Churches: Their Plan, Design, and Furniture," published in 1874, and of many papers on archæological and antiquarian subjects. His burial in the Abbey recalls the fact that Sir Charles Barry, Mr. George E. Street, Sir G. Gilbert Scott, and Mr. J. L. Pearson were interred there during the past century.

Correspondence.

Bent Joist to Carry Roof.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—On looking through your issue for June 13th last I am surprised to find what appears to me to be an error in the reply to an enquiry about a bent joist to carry roof. At the bend in the joist under consideration the bending moment is given as 13.5ft. tons—*i.e.*, 162 inch-tons—and the covers have only a resistance of about, say, 18ins. The covers would, therefore, be loaded to a maximum fibre stress of over 8.7 tons, whereas the joist itself is loaded to about 3.7 tons per sq. in. maximum. The joist at the heaviest loading develops about 5 tons maximum fibre stress, and I presume you would not load the cover plates beyond this. Keeping the covers within this stress they should be at least 14ins. deep, whereas to be stressed similarly to the joist at that point they would be about 16ins. deep. With the joist as shown the cover could only be about 10.6ins. deep. My reason for calling your attention to this is that when larger joists are dealt with the ordinary method of covering the web is insufficient with reasonable proportions in the work, and it is then necessary to cover the flange with a tension member which is also bent. How would you propose to cover a bent joist, say, 18ins. by 7ins. by 75lbs.?—Yours truly,

LONDON. J. LUMSDEN RAE.

To the Editor of THE BUILDERS' JOURNAL.

SIR,— In the case referred to it will be seen from Fig. 1, page 320, June 13th, 1906, that if the wall is taken as rigid the short bent portion of the rolled joist is in the position of a strut, and although the wall cannot be taken as perfectly rigid there will be enough stiffness to considerably relieve the tension at the joint. It might, perhaps, have been desirable to add a cover plate under the bottom flange. A bent joist 18ins. by 7ins. by 75lbs. could have the joint strengthened in the same way by web plates and cover plate to flange, but frequently web plates only are used.—Yours truly,

LONDON. HENRY ADAMS.

Our Plates

Cardiff City Hall and Law Courts.

We referred in our last issue to the splendid new City Hall and Law Courts which have been erected in Cathays Park, Cardiff, from designs by Messrs. Lanchester and Rickards. We are now able to give a general view of these two buildings. Perhaps the finest portion is the central block comprising the council chamber. In the City Hall building the chief apartments are—the assembly hall, which has a very rich plaster ceiling by Mr. Bankart, and some fine electroliers suspended down the centre; the council chamber, with its appurtenant rooms; and extensive suites of offices for the various departments. The Law Courts are divided into two main portions—the Assize Courts and the Police Courts. The plans of these will be found in our issue for March 15th, 1905. The design is the outcome of a competition held in 1897, for which premiums of £500, £300 and £200 were offered. It was not until 1899 that tenders were invited. The lowest of these was £129,705 for the City Hall and £96,583 for the Law Courts, making a total of £226,288. We believe however that, including the site, the total cost of the buildings has been nearly half a million. The general contractors were Messrs. E. Turner & Sons, of Cardiff. An excellent series of 35 illustrations of the buildings is given in "The Architectural Review" for November, accompanied by a descriptive article on the work by the architects. The total height of the clock tower is nearly 200ft., and the height of the dome more than 100ft.; while the two towers of the Law Courts reach 120ft.

New London Buildings

At yesterday's meeting of the London County Council the Building Act Committee reported the following applications under the London Building Act, 1894, their recommendations as to consent or refusal being appended in *italics*:

Wood and glass roof over a portion of the yard at the rear of No. 52, Mile End Road, Stepney. *(Rescission of resolution.)*

Conservatory over the entrance porch at No. 1, College Terrace, Fitzjohn's Avenue, Hampstead. *(Rescission of resolution.)*

Wood and glass conservatory over the entrance porch at No. 1, College Terrace, Fitzjohn's Avenue, Hampstead, without the walls under such conservatory being thickened, on the application of R. Smith & Son, on behalf of Dr H. Roger Smith. *(Consent.)*

Six one-storey shops in front of a portion of "The Priory," between Nos. 408 and 418, High Street, and Nos. 436 and 438, High Street, Lewisham. *(Rescission of resolutions.)*

Four one-storey shops in front of a portion of "The Priory," between Nos. 408 and 418, High Street, Lewisham, on the application of R. C. Fry, on behalf of W. J. Larke and H. O. Larke. *(Consent.)*

Two one-storey shops in front of Nos. 436 and 438, High Street, Lewisham, on the application of R. C. Fry, on behalf of W. J. Larke and H. O. Larke, *(Consent.)*

Retention of a porch and the erection of two porches in front of houses on the northern side of Larkhall Rise, Clapham, between No. 68 and the London, Brighton and South Coast Railway, on the application of J. Mayo. *(Consent.)*

One-storey addition in front of a motor house at "Baldorran," on the western side of College Road, Dulwich, on the application of W. Griffiths, on behalf of Bowyer & Co. *(Consent.)*

Retention of buildings on the eastern side of Pennard Road, Hammersmith, abutting upon the northern side of Goldhawk Road, on the further application of A. W. Hudson, on behalf of Gruntwag & Morton *(Consent.)*

Two-storey building at "The Wharf," Hythe Road, Willesden Junction, on the application of A. W. Collins. *(Consent.)*

Three wooden oriel windows at the second floor level, and a one-storey bay window and porch at the ground floor level in front of No. 52, Cromwell Road, Kensington. and two wooden oriel windows at the eastern flank of such building, on the application of Hampton & Sons. *(Consent.)*

Retention of an oriel window at the rear of No. 11, Sussex Square, Paddington, abutting upon Bathurst Mews, on the application of Hoare & Wheeler. *(Consent.)*

Refacing of the front and part of the flank of Bute House, No. 75, South Audley Street, St. George, Hanover Square, on the application of R. Philip, on behalf of H. L. Bischoffsheim. *(Consent.)*

Projecting oriel window at the second and third floor levels, and three projecting balconies at the second floor level on the Cockspur Street frontage of a building to be erected on the site of Nos. 14, 15 and 16, Cockspur Street, and Nos. 8, 10, 12 and 14, Warwick House Street, Strand, on the application of Stock, Page & Stock, on behalf of the Direction der Disconto-Gesellschaft. *(Consent.)*

Oriel window in front of Nos. 50 and 51, Fetter Lane, City, on the application of W. E. Hazell, on behalf of R. Melluish. *(Refusal).*

Motor-car shed at No. 205, Upland Road, East Dulwich, to abut upon Crebor Street, on the application of E. G. Young. *(Refusal).*

Additions at No. 50, Addison Road, Kensington, to abut upon Napier Road, on the application of E. H. Sim, on behalf of G. E. Baker. *(Refusal.)*

Projecting shop at No. 132, Penwith Road, Earlsfield, on the application of T. Aldred, on behalf of Andrews. *(Refusal.)*

Buildings on the eastern and western sides of Harborough Road, Streatham, on the application of C. M. Quilter, on behalf of F. T. Wooding & Son. *(Refusal.)*

Buildings on the northern side of Little Somerset Street, City, to abut also upon the eastern side of Harrow Alley, and to be at less than the prescribed distance from the centres of the roadways of the said streets, on the further application of W. Stewart, on behalf of Millner & Jutsum. *(Consent.)*

Building on the western side of Sugden Street, Camberwell, to abut upon the southern side of Depot Street, and to be at less than the prescribed distance from the centres of the roadways of the said streets, on the application of A. C. Remnant, on behalf of S. Lamb. *(Refusal.)*

Building on the western side of Willow Vale, Uxbridge road, Hammersmith, at less than the prescribed distance from the centre of the roadway of such street, on the application of L. J. Williams, on behalf of W. I. Friend, *(Consent.)*

Buildings on the south-eastern side of Cassland Road, Victoria Park, Hackney, westward of Brookfield Road, on the application of G. H. Lovegrove, on behalf of G. S. Shaw. *(Refusal.)*

Retention of wooden fences or barriers across Biddulph Road and Ashworth Road, on the Paddington estate, Sutherland Avenue, Paddington. *(Consent.)*

Formation or laying out of a new street for carriage traffic to lead out of the south side of Blackshaw Road, Tooting, and in connection therewith the widening of a portion of Tooting High Street and two existing ways out of the south side of Blackshaw Road, on the application of Taylor & Kensitt to the Council. *(Consent.)*

Formation or laying out of a street for carriage traffic on a site on the northern side of the Mitre Bridge loop line of the London and North-Western Railway, Hythe Road, Willesden, on the application of J. E. Watts to the Council on behalf of E. Collins. *(Refusal.)*

Ten houses on the eastern side of Latimer Road, Hammersmith, with an irregular open space at the rear of the northernmost house, on the application of M. Minkler. *(Consent to modification.)*

Additional storey over the one-storey rear portion of the "Derby Arms" public-house. No. 45, Vauxhall Street, Kennington, on the application of W. M. Proudfoot, on behalf of the Forest Hill Brewery Company, Ltd, *(Consent to modification.)*

Addition at the first floor level at the rear of No. 161, Regent Street, Strand, on the application of Bywaters & Sons, Ltd., on behalf of Edwards & Sons. *(Consent to modification.)*

Addition to the Curzon Hotel, Curzon Street, Mayfair, upon the site of Nos. 23 and 24, Bolton Street, so far as relates to the construction of an additional storey, on the application of D. Cubitt, Nichols Sons & Chuter. *(Consent to deviation.)*

The Theatres and Music Halls Committee also reported the following applications:—

Drawings submitted by W. M. Brutton, showing how it is proposed to construct a pass staircase from the grand circle to the balcony of the Alhambra Palace of Varieties, Leicester Square, and to fix an iron door between the wardrobe room and the staircase. *(Consent.)*

Drawings submitted by E. Wingfield-Bowles of the electrical installation at the Play House, Northumberland Avenue. *(Consent)*

Drawing submitted by Vaughan, Brown & Cook of the fire-resisting curtain proposed to be erected at the Putney Hippodrome, Felsham Road, Putney. *(Consent.)*

Drawing submitted by H. & G. Taylor of a conservatory proposed to be erected adjoining the Sportsbank Hall, Sportsbank Street, Catford. *(Consent.)*

Drawing submitted by G. H. Dyball showing how it is proposed to isolate the main electric switches, fuses. &c., now fixed to the walls of the pit lavatory at the Tivoli Music Hall, Strand *(Consent.)*

Trade and Craft.

Substitutes for White and Red Lead.

We have received a sample of a paint which has just recently been placed on the market as a substitute for red lead paint. This substitute is made in France and contains no lead or poisonous substances. It can be used equally well on wood, stone, stucco, cement, plaster, iron and other metals. The advantages of "Grisol" paint (as it is called) do not ie solely in the fact that it is free from ead—it is unaffected by extremes of temperature and does not blister, peel or crack, and even firmly adheres to steam pipes, heating apparatus, boilers, &c. It will withstand a temperature of over 300 degs. Fahr. and has great resistance to he action of sea water, ammonia, alkalis and acids. "Grisol" paint dries quickly. It is thinned ready for use with ordinary boiled linseed oil or turpentine. A further point in its favour is that t will keep for any length of time without becoming solid, as red lead does when ground in linseed oil. It is much cheaper than red lead because it has far ess weight and a greater covering power it is even claimed that it has greater anti-corrosive value). "Grisol" paint is supplied in one colour, a deep French grey, which is distinctly pleasing and has ed it to be favoured for finishing as well as priming. As it preserves metals against corrosion and has this pleasing olour, it should be largely used for paintng iron and steelwork. A substitute for white and red lead mastics is also made. t is termed "Grisol cement." This, likewise, contains no poisonous substances nd is used for water, gas and steam joints. It can be kept in stock without hardening at any ordinary temperature, which is not the case with similar preparaions. Joints made with this cement withstand pressure, and the cement being omewhat elastic the expansion and conraction of the metal is allowed for, thus preserving the joints from rust. It is kneaded very easily and does not stick to he hand. Finally, it is much cheaper han lead mastics owing to its lighter pecific gravity. These preparations are upplied from the London offices of Messrs. Lefranc & Co., 27, Fetter Lane, E.C.

Tenders.

Addressed postcards on which lists of tenders may be stated ill be sent post free on application to the Manager, BUILDERS' JOURNAL, *Great New Street, Fetter Lane, E.C.*

Information from accredited sources should be sent to The Editor" at latest by noon on Monday if intended for ublication in the following Wednesday's issue. Results f Tenders cannot be accepted unless they contain the name f the Architect or Surveyor for the work.

Chadwell Heath (Essex).—For (1) the enlargement of infants' school, and (2) erection of new mixed school to accommodate 300 children, for the Essex ducation Authority (Romford District Committee). Mr. James Kennedy, architect, 25, Bedford Row, London, W.C. :—

	Enlargements.			New school.
Gray, Dagenham	£2,198	0	0	... £4,669
Telf, Lowestoft	2,190	0	0	... 4,995
McKay, Clacton	2,180	0	0	... 5,098
Brown, Grays	2,120	0	0	... 5,102
Coulson & Lofts, Cambridge	2,112	0	0	... 4,931
Bell, Saffron Walden ...	2,100	0	0	... 5,160
Moss, Southend	2,100	0	0	... 4,500
Jarvis & Son, London ...	2,068	0	0	... 4,668
Wall, Ltd....	2,065	0	0	... 4,770
Death, Chadwell Heath	1,990	0	0	... 4,820
Bailey, Romford	1,989	2	6	... 4,699
Foulks, Loughborough...	1,985	0	0	... 4,785
Oak Building Co., Colchester	1,985	0	0	... 4,668
F. & E. Davey, Southend	1,979	0	0	... 4,893
Symes, Stratford	1,975	0	0	... 4,520
Myall & Upson, Ilford ...	1,975	0	0	... 4,578
Hammond & Sons, Romford...	1,969	0	0	... 4,587
Willmott, Ilford	£1,927	0	0	... £4,597
Lawrence & Son, Waltham Cross	1,924	0	0	... 4,492
Patrick, Wandsworth ...	1,900	0	0	... 4,690
Dowsing & Davis,* Romford	1,875	0	0	... 4,300
Steadman & Co., Forest Gate...	1,873	0	0	... 4,236
F. Davey, Southend ...	1,850	0	0	... 4,385
W. H. Hyde, Norwood...	1,840	0	0	... 4,343
Westgate, Romford ...	1,807	0	0	... 4,248
Woodward, Stock	1,760	0	0	... 4,250

* Recommended for acceptance.

Cleethorpes (Lincs.).—For the erection of an elementary school in Elliston Street, for the Lindsey C.C. Education Committee. Messrs. Scorer and Gamble, architects, Bank Street Chambers, Lincoln :—

Spencer, Santo, & Co., Felixstowe	£11,750	0	0
G. F. Mashford & Sons, Cleethorpes	11,115	10	0
P. Rhodes, Leeds	10,997	0	0
H. W. Parker & Son, Boston ...	10,535	0	0
Mawer Bros., Louth, Lincs.	10,488	10	0
W. Ion, Grimsby	10,400	0	0
Hewins & Goodhand, Grimsby ...	10,375	0	0
W Gilbert, Grimsby	10,205	0	0
Holmes & Richardson, Grimsby	10,200	0	0
Thompson & Sons, Grimsby	10,200	0	0
P. McGinnis, Market Rasen, Lincs.	10,084	12	2
D. Gill & Son, Doncaster	10,057	0	0
Sprakes & Sons, Doncaster	9,997	10	0
Elmes, Gainsborough	9,881	3	0
Wilkinson & Houghton, New Clee, Grimsby	9,850	0	0
F. Scarborough, Lincoln	9,768	9	5
J. Guttridge, Peterborough	9,450	0	0
C. Wright, Leicester	9,290	0	0
Moss & Sons*, 39, Baxter Gate, Loughborough	9,275	0	0

* Accepted.

Gillabbey (Ireland).—Accepted for the erection of two houses. Messrs. W. H. Hill & Son, architects, South Mall, Cork :—

W. J. Omahony, Ardbarra, Magazine Road, Cork	£1,125

London, E.C.—For the construction of a suction hopper dredger of a capacity of 3,500 tons, for the Thames Conservancy Board :—

Lobnitz & Co., Renfrew	£93,400
Vickers, Sons & Maxim, Barrow-in-Furness	81,000
Fleming & Ferguson, Paisley	79,450
W. Simons & Co., Renfrew...	78,000
Ferguson Bros.,* Port Glasgow...	71,750

Note.—Time for delivery in accepted tender, 12½ months. *Accepted.

London, E.—For the rebuilding of the Byron and Bright Street School, Poplar, for the L.C.C. :—

C. Miskin & Sons, St. Albans ...	£22 087	0	0
McCormick & Sons, Canonbury ...	21,018	0	0
W. H. Lascelles & Co., Ltd., 121, Bunhill Row	20,886	18	3
L. H. & R. Roberts, Islington ...	20,637	0	0
Perry & Co., Bow	20,556	0	0
J. Appleby & Sons, Lambeth... ...	20,543	0	0
H. Lovatt, Ltd., Wolverhampton...	19,974	0	0
C. Wal , Ltd., 4, Lloyd's Avenue...	19,951	0	0
Kirk & Randall, Woolwich	19,497	0	0
G. E. Wallis & Sons, Ltd., Maidstone	19,072	0	0
E. Lawrance & Sons, City Road ...	18,953	0	0
Patman & Fotheringham, Ltd., Islington	18,673	0	0
J. Greenwood, Ltd., London Bridge	18,624	0	0
Treasure & Son, Upper Holloway	18,370	0	0
J. & C. Bowyer,* Westow Street, Upper Norwood	18,249	0	0

*Recommended for acceptance.

Estimate of architect (Education), £20,464.

London, E.—For improvements at the St. John's, Halley Street, School, Limehouse, for the L.C.C. :—

C. Miskin & Sons, St. Albans ...	£11,053	0	0
H. Lovatt, Ltd., Wolverhampton	10,965	0	0
J. Marsland & Sons, Walworth ...	10,894	0	0
Perry & Co., Bow	10,638	0	0
E. Lawrence & Sons, City Road ...	10,593	0	0
A. E. Symes, Stratford	10,082	0	0
J. Greenwood, Ltd., London Bridge	10,082	0	0
G. E. Wallis & Sons, Ltd., Maidstone	10,072	0	0
Patman & Fotheringham, Ltd., Islington	9,983	0	0
Treasure & Son, Upper Holloway	9,715	0	0
J. Hawkins & Co., 109, Victoria Street...	9,653	5	6
T. G. Sharpington, Nunhead ...	9,605	0	0
J. & M. Patrick,* Point Pleasant, Wandsworth	9,204	0	0

*Recommended for acceptance.

Estimate of architect (Education), £9,553.

London, E.—For the additions and alterations to the electricity works in Osborne Street, Whitechapel, for the Stepney B. C.:—

A. N. Coles, Plymouth	£1,567	0	0
Stedman & Co., Forest Gate	1,380	0	0
Thomas & Edge, Woolwich	1,273	0	0
Holliday & Greenwood, Brixton ...	1,259	0	0
F. & T. Thorne, Isle of Dogs	1,247	0	0
A. E. Symes, Stratford	1,245	0	0
F. & F. J. Wood, Mile End	1,238	0	0
Perry & Co., Bow	1,224	0	0
J. Calcutt, Mile End	1,220	0	0
Spencer, Santo, & Co., Kensington	1,200	0	0
G. Barker, Whitechapel	1,195	0	0
Patman & Fotheringham, Islington	1,172	0	0
F. & E. Davey, Southend-on-Sea ...	1,120	0	0
McLaughlin & Harvey, Brecknock Road, N.W.	1,093	0	0
B. E. Nightingale,* Albert Embankment, S.E.	1,066	0	0

* Recommended for acceptance.

London, S.E.—For extensions and alterations to baths and wash-houses in Kennington Road, for the Lambeth B.C. Mr. H. C. J. Edwards, C.E., borough engineer, 346, Kennington Road, S E. :—

F. & G. Foster, Norwood Junction	£2,222
H. Bragg & Sons, Brixton	£2,212
W. J. Mitchell & Son, Dulwich Village ...	2,101
F. G. Minter, Putney	2,078
Johnson & Co., Southwark Bridge Rd., S.E.	2,075
W. Smith & Son, Harleyford Road, S.E.	2,025
Spencer, Santo & Co., Kensington Rd., W.	1,973
A. N. Coles, Plymouth	1,938
J. E. Johnson & Son, Westminster	1,870
W. H. Hyde & Co., Norwood Junction ...	1,847
Martin, Wells & Co., Vauxhall	1,829
T. Bendon, Hammersmith	1,828
T. G. Sharpington, Nunhead	1,828
W. Lawrence & Son, Waltham Cross ...	1,824
Edwards & Medway, 9, Ethelred St., S.E.	1,721
B. E. Nightingale, Albert Embankment, S.E.	1,690
F. Deacon & Son, Addlestone	1,673
W. Mills,* St. George's Road, Westcombe Park, S.E.	1,584

*Accepted.

Mapperley, Nottingham.—For the erection of two pairs of cottages on the Porchester Estate for J. Bowes, Esq. Mr. Harry H. Goodall, architect, Brougham Chambers, Wheeler Gate, Nottingham :—

F. M. Thompson & Sons	£840	0	0
G. A. Pillatt	825	0	0
J. Cooper & Son	815	0	0
H. Ingham...	776	0	0
T. Cuthbert	775	0	0
W. Appleby	760	0	0
J. Hutchinson & Son	720	0	0
T. H. Harper*	700	0	0

*Accepted.

Plumbing to above.

Humphrey's, Ltd.	£93	0	0
Knight & Farr	89	0	0
W. H. Lane	86	19	4
F. E. Binley	86	11	0
A. R. Knight*	82	14	0

*Accepted.

Seacroft (Lincs.)—For the erection of a cottage for Miss Broughton. Mr. Harry H. Goodall, architect, Brougham Chambers, Wheeler Gate, Nottingham :—

J- Crawshaw, Skegness	£410	0	0
T. H. Harper, Carlton	370	11	6
F. M. Thompson & Sons, Nottingham	360	0	0
J. T. Turner & Son, Wainfleet... ...	360	0	0
H. Ingham,* Nottingham	340	0	0

*Accepted.

Swindon.—Accepted for the construction of a brick sewer, with manholes in Ferndale Road, for the Corporation. Mr. H. J. Hamp, borough surveyor :—

T. Watson, junr., Mount Pleasant, Southall, Middlesex	£3,040

West Lynn (Norfolk).—Accepted for the erection of a new school for the Norfolk Education Committee :—

Elworthy & Co., Upwell	£3,100

Note.—Fifteen tenders received.

Weston-super-Mare.—For the erection of a bungalow at Uphill, for J. M. Newton, Esq. Messrs. Thomas Scammell, Son & Perkins, architects, 10, John Street, Bristol :—

J. Perkins & Son, Ltd., Bristol	£685
Stephens & Bastow, Bristol	678
J. Hawkins & Son, Rudgeway	605
C. Addicott, Weston-super-Mare	600
R. Ford & Sons, Cheddar	570
A. J. Beaven, Saltford	560
H. Fear, Weston...	518
G. Sprake*, Weston	490

* Accepted.

Coming Events.

Wednesday, November 7.

Builders' Foremen and Clerks of Works' Institution.—Meeting at 8 p.m.

Thursday, November 8.

Architectural Association.—Conversazione at Tufton Street, at 8 p.m.

Institution of Electrical Engineers.—Presidential address by Dr. R. T. Glazebrook, F.R.S., at 8 p.m.

Friday, November 9.

Eastern Counties Federation of Master Builders.—Meeting at Colchester, at 4 p.m.

Monday, November 12.

Surveyors' Institution.—Presidential address by Mr. George Langridge, at 8 p.m.

Tuesday November 13.

Architectural Association of Ireland.—Smoking Concert.

Institution of Civil Engineers.—Mr. Charles Frewen Jenkin, B.A., A.M.I.C.E., on "Single-Phase Electric Traction," at 8 p.m.

Thursday, November 15.

London Institution.—Prof. Herkomer on "Artistic Possibilities of the Machine," at 6 p.m.

Friday, November 16.

Birmingham Architectural Association.—Mr. Halsey Ricardo on "The Architect's Use of Enamelled Tiles."

Institution of Mechanical Engineers.—Meeting at 8 p.m.

Society of Architects.—Visit to Winchester Cathedral works and the Hospice of St. Cross.

Monday, November 19.

Royal Institute of British Architects.—Mr. A. E. Henderson on "The Crœsus (6th century B.C.) Temple of Artemis at Ephesus," at 8 p.m.

Institute of Sanitary Engineers.—Prof. E. G. Coker, M.A., D.Sc., on "The Structure of Metals."

Liverpool Architectural Society.—Mr. H. L. Beckwith on "Some Thoughts and Hints for Young Quantity Surveyors."

Complete List of Contracts Open.

WITH a few exceptions, news of Contracts Open are not repeated after they have been published once in these columns, so that readers will find particulars in our previous issues of other contracts that still remain open.

Unless expressly stated to the contrary, all deposits required for bills of quantities, &c., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair-wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

Nov. 10. Barbrook.—*Erection of a classroom* at the Wesleyan Schoolroom, Barbrook. Persons desirous of tendering may see plans at the schoolhouse. Tenders to be sent to the Rev. F. A. Smyth, Lynton, on or before Nov. 10.

Nov. 10. Gerrans.—*Renovating the Wesleyan Chapel*, Gerrans. Specifications may be seen at Mr. Barnett's, chapel keeper, Gerrans. Endorsed tenders to be sent on or before Nov. 10, to J. Lobb, Pollaughan, Portscatho.

Nov. 10. Penzance.—*Erection of a wing* and other additions and alterations to the Riviera Palace Hotel, Penzance. The drawings and specification may be seen at the offices of O. Caldwell, F.R.I.B.A., architect, Victoria Square, Penzance. Sealed tenders, endorsed, "Tender for Riviera Palace Hotel," to be sent to the Secretary, Riviera Palace Hotel Co., Ltd., 6, Clement's Inn, Strand, London, on or before Nov. 10.

Nov. 12. Belfast.—*Erection of new shops* and warehouse in Smithfield for Simpson & Mitchell, glass and colour merchants. Plans and specifications may be had of Thomas Houston, architect and civil engineer, King's Court, Wellington Place, Belfast. Plans and specifications may be had of him on or before Nov. 12.

Nov. 12. Blackburn.—*Demolition of the buildings* Nos. 116a and 116b, King Street, including the purchase and removal of the materials. Tenders, endorsed "Buildings, King Street," to be sent to L. Beard, town clerk, Town Hall, Blackburn, not later than 12 o'clock at noon on Nov. 12.

Nov. 12. Westham.—*Erection of a new public elementary school* for infants at Westham. Persons desirous of tendering are requested to send their names and addresses to F. J. Wood, county surveyor of East Sussex, County Hall, Lewes, on or before Nov. 12, from whom full particulars can be obtained.

Nov. 12 Stourbridge.—*Erection of engineer's house* at Destructor Works, off Enville Street, for the U.D.C. Plan, specification, and conditions may be seen and any further information may be obtained upon application to F. Woodward, surveyor, the Town Hall, Stourbridge. Sealed tenders, endorsed "Tender for Engineer's House," may be sent to him not later than 12 noon on Nov. 12.

Nov. 12. Ilford.—*Roofing-in with reinforced concrete* of the septic tanks, &c., at the Outfall Works, Loxford Lane, Ilford, for the R.U.D.C. Plans and specifications may be seen, and form of tender obtained on payment of a deposit of £2 2s., on application to H. Shaw, A.M.I.C.E., engineer and surveyor to the Council, Town Hall, Ilford, during the usual office hours. Sealed tenders, endorsed "Tender for Concreting," must be sent to J. W. Benton, clerk to the Council, Town Hall, Ilford, on or before noon. Nov. 12.

Nov. 12. Ashington, New Hirst.—*Erection of new Council school*, to accommodate 680 scholars together with caretaker's dwellinghouse and cookery centre, at Ashington, New Hirst. Contractors desirous of tendering for the work should forward particulars of their name and address to C. Williams, secretary to the Education Committee, Pearl Buildings, Newcastle-on-Tyne, not later than Oct. 27, together with a deposit of £2 2s. Plans of the work may be inspected at the Committee's Offices, and tenders endorsed "Tender for New Hirst Council School," must be forwarded to the Secretary not later than 4 p.m. on Nov. 12.

Nov. 12. Epsom.—*Erection of two acute blocks* and the re-building of a nurses' block, at the Manor Asylum, Epsom, Surrey, for the L.C.C. Instructions for tender, and form of tender and contract, with specification, can be obtained from the Clerk of the Asylums Committee, 6, Waterloo Place, London, S.W., upon payment of £5, and the plans may be inspected at the office of the Asylums Engineer, at 6, Waterloo Place, between the hours of 10 a.m. and 4 (except Saturday), and on that day between the hours of 10 and 1 p.m. Tenderers can also obtain from the engineer permission to view the site. Tenders must be on the printed form, accompanied by the form of contract and schedules thereto and forms of bond, and must be enclosed in an envelope, sealed and endorsed "Tender for New Buildings, Manor Asylum," and delivered at the office of the committee not later than noon on Nov. 12. The contractor will have to enter into bonds in the sum of £700 with approved sureties, as security for the performance of the contract. Fair wages clause.

Nov. 13. Gosforth.—*Erection of stables* at the rear of the Council Chambers, High Street, for the U.D.C. Plans and specification may be seen, and all information obtained at the office of G. Nelson, engineer and surveyor to the Council, Council Chambers, Gosforth, to whom application should be made for quantities. Tenders endorsed "Erection of Stables," to be sent to R. S. Holmes, solicitor, clerk to the Council, Council Chambers, Gosforth not later than Nov. 13.

Nov. 13. Maldon.—*Alterations to North Fambridge school.* Plan and specification can be seen at the office of F. H. Bright, clerk to the Maldon Local Advisory Sub-Committee, 53, High Street, Maldon, between the hours of 10 and 4 any working day except Saturday. The tender accepted must be subject to the approval of the Local Government Board and the Essex County Council. Sealed tenders, endorsed "Alterations to North Fambridge School," to be delivered to the clerk not later than Nov. 13.

Nov. 15. Belfast.—*Construction of an underground convenience* in Donegal Square North, for the County Borough of Belfast. Drawings, specification, and form of tender may be obtained in the City Surveyor's office on payment of £1 1s. Tenders, endorsed "Underground Convenience," to be lodged with S. Black, town clerk, before 10 o'clock on Nov. 15.

Nov. 15. Hamworthy.—*Erection of additional buildings* and alterations to the schools at Hamworthy. Plans and specifications can be seen at the office of H. F. J. Barnes, architect and surveyor, Towngate Street, Poole. Tenders to be delivered on or before Nov. 15, addressed to C. Lisby, secretary to the Education Committee, Fish Street, Poole, and endorsed "Tender Schools, Hamworthy."

Nov. 15. Crumpsall.—*Alterations of a part of* the Workhouse, Delaunay's Road, Crumpsall, in connection with the provision of store rooms, for the Guardians of the Prestwich Union. Specifications may be obtained at the Workhouse between the hours of 10 and 12 noon, on application to the workhouse master Mr. Jones. Tenders endorsed "Tender for Store Rooms" to be addressed to E. W. Ogden, clerk to the Guardians, Union Offices, Cheetham Hill Road, Manchester, and delivered by 10 a.m. on Nov. 15, on which day they will be opened by the Guardians.

Nov. 19. Cardiff.—*Erection of new schools* for 448 children off Clarence Road, Cardiff, for the Rev. Gilbert Heaton, M.A., and the managers of St. Mary's National Schools, Cardiff. Plans and specifications may be seen and quantities obtained of Veall & Sant, architects, Cardiff. Sealed and endorsed tenders to be sent to them not later than Nov. 19.

Nov. 20. London, E.—*Erection of an additional furnace* in connection with the dust-screening apparatus at Marian Square, for the Council of the Metropolitan Borough of Bethnal Green. Plans and specifications can be seen, and form of tender obtained, upon application to the Borough Engineer and Surveyor at the Town Hall, Church Row, Bethnal Green, any day between the hours of 10 a.m. and 4 p.m. Fair wages clause. Tenders, sealed and endorsed "Furnace," must be delivered to R. Voss, town clerk, Town Hall, Bethnal Green, E., not later than 12 noon on Nov. 20.

Nov. 20. London, S.E.—*Erection of a mortuary*, Coroner's Court, and other buildings on a site in Baildon Street and Watson Street, Deptford, according to the drawings and specifications prepared by H. T. Bonner, A.R.I.B.A., to be seen at the Town Clerk's office, Town Hall, New Cross Road, between 10 and 4 o'clock, Saturdays between 10 and 1. Bills of quantities prepared by A. Crocker, together with the conditions of contract, may be obtained from V. Orchard, town clerk, Town Hall, New Cross Road, S.E., on payment of £2 2s. Persons desirous of tendering must send in their names to the Town Clerk on or before Nov. 17. Tenders, sealed and endorsed "Mortuary and Coroner's Court," must be delivered to the Town Clerk in accordance with the Council's regulations as to the receipt of tenders, at the Town Hall not later than 4 p.m. on Nov. 20. Fair wages clause.

Nov. 21. Liskeard.—*Erection of a new secondary school* at Liskeard. Plans and specifications may be seen at the office of J. Saneom, Architect to the Committee, Liskeard, from whom all particulars relating to the work may be obtained. Sealed endorsed tenders, on official forms, which may be had from the architect, are to be sent to F. R. Pascoe, secretary, Education Office, Truro, on or before Nov. 21.

Nov. 21. Thirsk. — *Proposed alterations to Thirsk Infants' Council School* for the Education Committee. Contractors desirous of submitting an estimate for the whole of the several works in connection with this may obtain forms of tender and inspect plans and specification at the office of C. Moore, Millgate, Thirsk, or at the County Hall, Northallerton, during ordinary office hours. Tenders to be delivered to D. Smith, secretary, County Hall, Northallerton, not later than Nov. 21, sealed and endorsed "Tender for Alterations, Thirsk Infants' School."

Nov. 22.—Priestwood. — *Building of a new school* for 200 scholars at Priestwood, Easthampstead, near Bracknell, Berks. Builders desirous of tendering are required to send in their names to the Secretary of the Education Committee, The Forbury, Reading, together with a deposit of £3 3s., for bills of quantities. Plans, specification, and form of contract will be open for inspection at the Education Secretary's office between the hours of 10 and 5. Tenders must be delivered at the office of the Education Secretary, on the form and in the envelope provided, not later than the first post on Nov. 22.

Nov. 24. Hyde.—*Erection of the Leigh Street Council School* to accommodate 1,200 children. Plans and specifications may be seen at the office of J. Lindley, architect, Town Hall Chambers, Hyde. Bills of quantities, forms of tender, &c., may be obtained from S. Ashford, secretary, Education Offices, Hyde, on a deposit of £3 3s. Sealed tenders, on the official forms and enclosed in the envelopes provided, must be delivered to the Secretary not later than Nov. 24. Fair wages clause.

Nov. 24. Barnwood.—*Erection of a new block* to accommodate about 170 female patients, at the Second County Asylum, Barnwood, near Gloucester. Bills of quantities and forms of tender can be obtained from Giles, Gough & Trollope, architects, 28, Craven Street, Charing Cross, London, W.C., on payment of £3 3s. Plans and specifications can be seen at the architects' office, 28, Craven Street. aforesaid, and at Wotton Asylum Gloucester. Sealed tenders, on forms supplied, are to be delivered to J. Thompson, clerk to the visitors, Wotton Asylum, Gloucester, on or before Nov. 24.

Dec. 1. Roscrea, Co. Tipperary.—*Erection of a new bacon factory* at Roscrea, Co. Tipperary, for the directors of the Roscrea Bacon Factory, Ltd. (1) Excavations, foundation, concrete floors and walls. (2) Corrugated iron buildings or alternatively buildings with Belfast felt roofing. Plans, specifications, and forms of tender may be obtained on payment of a deposit of 40s. Tenders to be submitted by Dec. 1.

No date. Seaton Carew.—*Erection of buildings &c.*, and for supply of materials in connection with new Smelting Works near Seaton Carew for the Central Zinc Company, Ltd. Particulars will be furnished only on written application to H. M. Ridge, general manager, Seaton Carew.

No date. Tanygarreg.—*Repairs and improvements* to the Tanygarreg Council school. Drawing and specification can be seen and full particulars obtained on application to the headmaster or G. D. Lewis, M.S.A., county architect, Aberystwyth,

ENGINEERING.

Nov. 13. Long Ditton.—*Construction of six filter beds*, a service reservoir and other contingent works at Long Ditton, for the Metropolitan Water Board. Forms of tender and contracts, with specification, &c., may be obtained on application to the engineer, Brixton Hill, S.W., on production of an official receipt for the sum of £5, which sum must first be deposited with the comptroller, at the Board's Central Offices, Savoy Court, Strand, W.C. Tenders, enclosed in sealed envelopes, addressed to the Clerk of the Board, Metropolitan Water Board, Savoy Court, Strand, W.C., and endorsed "Tender for Filter Beds and Reservoir, Long Ditton," must be delivered at the offices of the Board, not later than 10 a.m. on Nov. 13.

Nov. 17. Oakwood, near Port Talbot.—*Heating of the Council schools* at Oakwood (near Port Talbot), Crynant and Onllwyn (near Neath), for the Glamorgan C.C. Plans and specification of the work may be obtained of T. M. Franklen, clerk of the County Council, Glamorgan County Council offices, Westgate Street, Cardiff. Fair wages clause. Tenders, made out on the form supplied, are to be delivered to the Clerk of the C.C. not later than Nov. 17, marked outside "Tender for Heating Oakwood" or "Crynant School," &c., &c., as the case may be.

Nov. 19. Pontypridd.—*Excavation, &c.*, for laying a 9-in. main between Ferndale and Tylorstown, a distance of about 3,000yds., for the Pontypridd Water Works Co. Specifications can be seen and full particulars obtained at the manager's office, 28, Gelliwastad Road, Pontypridd. Tenders, endorsed "Main Laying," must be sent to M. Morgan, secretary, 28, Gelliwastad Road, Pontypridd, not later than 10 a.m. on Nov. 19.

Nov. 20. London, S.E.—*Heating two dining halls* and the chapel at the Workhouse, Renfrew Road, Lower Kennington Lane, S.E. Firms tendering may suggest the system they recommend, and can inspect the building any day except Saturdays. The consulting engineer to the Guardians, G. E. Arnold, 195, Kennington Road, S.E., will, if desired, meet them by appointment. Tenders must be sent by post not later than Nov. 20 to W. Thurnall, Clerk to the Guardians, Guardians' Board-room and Offices, Brook Street, Kennington Road, S.E., sealed and superscribed "Tender for heating."

Dec. 3. London.—*Widening works* along the Essex Road from the village of Edgware, Middlesex, northwards for a distance of about one mile, in connection with tramway works for the Middlesex C.C. Plans and specifications of the works may be seen, and bills of quantities obtained, of H. T. Wakelam, M.Inst.C.E., county engineer, Middlesex Guildhall, Westminster, S.W., on payment of £5 5s. Tenders, sealed and endorsed "Edgware Road Widenings," to be delivered to Sir Richard Nicholson, clerk of the County Council, Middlesex Guildhall, Westminster, S.W., on or before Dec. 3.

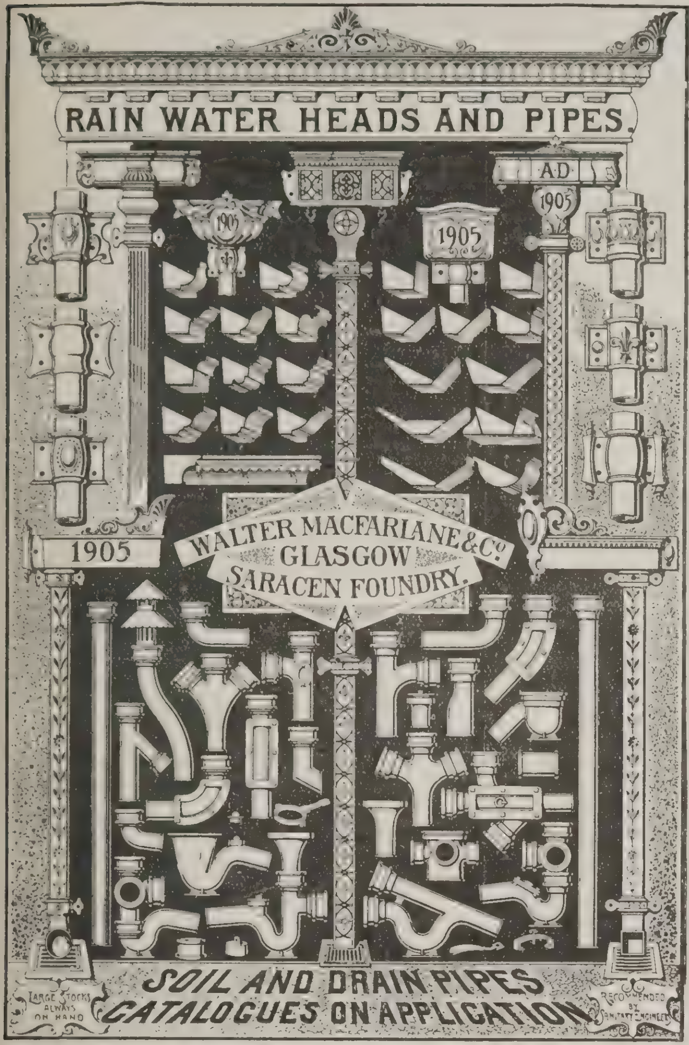
Dec. 18. Woodstock, Cape of Good Hope.—*Public lighting* of the town of Woodstock for a term of five years from Jan. 1, 1908. Tenders are invited and will be received at the Town House, Woodstock, up to 1 p.m. on Dec. 18, 1906. Tenders to state *inter alia* :—(*a*) The nature of the light to be employed. (*b*) The rate per lamp per annum. (*c*) The rate for removal of lamps in terms of Clause 6 of the General Conditions. (*d*) The rate for private lighting. The General Conditions of the Contract, and a plan of the town showing present positions of lamps, will lie for inspection of tenderers at the Town House, Woodstock, and at the office of the Council's London agents, J. C. Mackinlay & Co., 27, Walbrook, London, E.C., with whom tenders should be lodged not later than Nov 28.

Dec. 31. Rome.—*Construction and operation* of the new street railways at Rome for the Municipal Council of Rome. For further particulars, apply to The Sindaco Di Roma. Tenders to be delivered not later than Dec. 31,

IRON AND STEEL.

Nov. 12. London, E.C.—*Supply and delivery of 2,790 tons steel rails*, 50lbs. per yd., 79 tons fish-plates for ditto, for the Bengal & North Western Railway Co., as per specification to be seen at the company's offices. Tenders addressed to A. Izat, Managing Director, 237, Gresham House. Old Broad Street, London, E.C., and marked "Tender for Rails and Fish-plates," are to be lodged not later than noon on Nov. 12. For each specification a fee of 10s. will be charged, which cannot under any circumstances be returned.

Nov. 13. London, S W.—*Supply of* (1) 1,200 pairs wheels and axles, (2) 20,000 steel sleepers and keys, for the Board of Directors of the Southern Mahratta Railway Co., Ltd., as per specifications and drawings, which may be seen at the Offices of the Company, 46, Queen Anne's Gate, S.W. The charge for each specification is £1 1s., which will not be returned. Tenders must be sent in addressed to the Secretary, marked "Tender for Wheels and Axles," or as the case may be, not later than 12 noon on Nov. 13.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Nov. 13. London, S.W.—*Supply of rails*, 90lbs. per yard, dog spikes, for rails for the Secretary of State for India in Council The conditions of contract may be obtained on application to the Director-General of Stores, India Office, Whitehall, S.W., and tenders are to be delivered at that office by 2 p.m. on Nov. 13.

Nov. 20. London, E.C.—*Supply of steel material* for the Directors of the Bombay, Baroda and Central India Railway. Tenders must be made on forms, copies of which, with specification, can be obtained of W. V. Constable, secretary, Gloucester House, 2, 3 and 4, Bishopsgate Street Without, London, E,C., on payment of £1 1s., which will not be returned. Tenders are to be delivered by noon on Nov. 20.

PAINTING AND PLUMBING.

Nov. 14. Harrogate.—*Colouring, whitewashing and painting* the Royal Bath Hospital and Rawson Convalescent Home, Harrogate. Specifications of work may be seen daily at the Hospital, between 1 and 4 p.m. Tenders to be sent in by noon Nov. 14, to B. Shaw, secretary.

Nov. 23. Salford.—*Painting two bridges* over the river Irwell. The specification, form of tender, and all information may be obtained at the Borough Engineer's office. Tenders, endorsed "Painting Bridges," addressed to the Chairman of the Building Committee, must be delivered to L. C. Evans, town clerk, Town Hall, Salford, not later than 10 a.m. on Nov. 23.

ROADS AND CARTAGE.

Nov. 8. Stretford.—*Asphalting Seymour Park School Playground.* Specifications, plans and particulars will be furnished by E. Woodhouse, architect, 88, Mosley Street, Manchester, on payment of £1 1s. Tenders must be addressed "Chairman of the Sites and Buildings Committee," and delivered at the Council's Offices, Old Trafford, not later than Nov. 8, endorsed "Asphalting."

Nov. 17. Hale.—*Supply and laying* of about 532 super. yards of annealed concrete paving, for the U.D.C. Plans and specifications can be seen and bills of quantities and forms of tender may be obtained on the payment of a deposit of 10s. 6d. at the office of F. E. Boaz, Council's surveyor, any day during the usual office hours. Tenders and priced bills of quantities are to be received by J. G. Whyatt, clerk to the Council, Council Offices, Hale, Cheshire, not later than noon on Nov. 17, in sealed envelopes, which will be supplied.

Nov. 17. Lee.—*Sewering, levelling, paving*, flagging, and channelling of the following streets within the district of Lees, namely: Burton Street, that part of Thomas Street extending from the paved portion thereof to Nether Lees, a distance of 125yds. or thereabouts; Sunny Bank Road, from Thomas Street to Damfield, a distance of 136yds. or thereabouts; Acorn Street, Chapel Street, Ancoats Street, Benyon Street, from Saint John Street to High Street; Albert Street, Nelson Street, Dawson Street, Mellor Street, Prince's Street, Cross Street, Nether Lees, and that part of New Street extending from High Street to the north side of Owl Street, a distance of 176yds. or thereabouts; or for any one or more of such streets, but a separate sum must be named for each street and for the providing of all necessary materials required for carrying out the several works. Copies of the specifications and bills of quantities and all further particulars may be obtained on application to A. H. Mountain, A.M.I.C.E., engineer, Prince's Chambers, 16, John Dalton Street, Manchester, on payment of £1 1s., and at whose office plans and sections may be seen. The person or persons whose tender is accepted will be required to find sufficient security for the satisfactory completion of the work. Sealed tenders, made out on the form provided by the engineer and endorsed "Tender for Street Works," must be sent or delivered to J. W. Smith, J.P., Chairman of the Council, 30, Thomas Street, Lees, not later than Nov. 17.

SANITARY.

Nov. 9. Uddingston.—*Construction of an outfall sewer*, about one mile in length, from the junction of the Myres Burn with the Powburn to Powburn Toll. Plans may be seen, and copies of the specification and schedule of measurement obtained, at the office of W. L. Douglass, C.E., district engineer, district offices, Hamilton, on payment of £1. An assistant engineer will meet intending contractors at Uddingston West Station (North British Railway) at 10.22 a.m. on Oct. 25. Sealed tenders, endorsed on outside "Tender for Outfall Sewer," must be lodged with the Clerk to the Subcommittee, J. Cormack, Bank of Scotland, Uddingston, not later than 10 a.m. on Nov. 9.

Nov. 10. Swindon.—*Supply and delivery to the G.W.R. Station*, Swindon, of a cast-iron public urinal in accordance with the plan and particulars to be obtained on written application to H. J. Hamp, borough surveyor, Town Hall, Swindon. Tenders, endorsed "Public Urinal," to reach R. Hilton, town clerk, by 12 noon on Nov. 10.

Nov. 10. Woodsetts.—*Sewerage and sewage disposal works* in the parish of Woodsetts for the R.D.C. of Kiveton Park. The contract comprises the laying of about 1,700 yards of 6-in. and 9-in. pipe sewers, together with manholes and other appurtenant work, and the construction of small septic tanks and percolating filters. Plans may be seen, and specifications, bills of quantities and forms of tender obtained on application to J. P. Evans, surveyor, Kiveton Park, N. Sheffield, on payment of £2 2s. The successful contractor will be required to enter into a bond with approved sureties for the due performance of his contract. Sealed and endorsed tenders to be sent to J. S. Whall, solicitor, clerk to the Council, Bridge Street, Worksop, Notts., on or before Nov. 10.

Nov. 13. Cheshunt.—*Construction of a surface water sewer* in Longfield Lane, consisting of about 665yds. lin. armoured concrete tubes and about 460yds. lin. stoneware pipes, together with street gullies and inspection chambers; also the erection of a concrete retaining wall and other incidental works for the U.D.C. Plans and specifications may be seen and quantities and forms of tender obtained of R. H. Jeffes, Assoc.M.I.C.E., engineer and surveyor, Manor House, Cheshunt. Sealed tender to be delivered in official envelope, which will be supplied, on or before Nov. 13.

Nov. 13. Hailsham.—*Construction of about 410yds. run of 9-in. pipe sewers*, with five manholes and the necessary works in connection therewith, for the R.D.C. The drawings may be seen at the Council Offices between 10 a.m. and 4 p.m. on weekdays (except Saturdays, 10 a.m. to 1 p.m.), and copies of the specification, bill of quantities, and form of tender may be obtained on the deposit of 10s. Sealed tenders, endorsed "Tender for Polegate Sewerage," are to be sent to E. Catt, clerk, Council Offices, 17, London Road, Hailsham, not later than Nov. 13.

Nov. 13. Bedworth.—*Private drainage work* in the parish of Bedworth for the Foleshill R.D.C. Specification may be seen, and form of tender obtained, on application to A. E. Newey, surveyor, Council Offices, Foleshill, between the hours of 9 and 10 a.m. Endorsed tenders to be sent to A. P. Oswin, clerk, Council Offices. Littleheath, Foleshill, so as to be received not later than first post on Nov. 13.

Nov. 14. Leeds.—*Two slip sets of combined engines* and centrifugal pumps for pumping crude sewage from the main sewer into prepipitation tanks at Knostrop Sewage Works for the Sewerage Committee. Copies of drawing, conditions of contract and form of tender may be obtained at the office of G. A. Hart, engineer, Municipal Buildings, Leeds, on deposit of *bona fide* tender and all documents supplied to the tenderer. Tenders to be addressed to the Town Clerk, Town Hall, Leeds, and endorsed "Tender for Pumping Engines, Knostrop," not later than 10 a.m. on Nov. 14.

Nov. 19. Barnsley.—*Contract No. 2. Providing and fixing revolving sewage sprinklers*, distributors, and automatic discharging apparatus, together with all the necessary castings and fittings to the same, at the proposed continuous filters to be constructed near Lund Lane, within 3 miles of Barnsley, for the Council. Further particulars, with a plan of the site, may be obtained on personal application to J. H. Taylor, M.Inst.C.E., borough surveyor (engineer for the scheme), Manor House Offices, Barnsley, to whom tenders, properly sealed and endorsed, are to be delivered not later than 10 a.m. on Nov. 19.

Nov. 19. Barnsley.—*Contract No. 3. Construction of collecting and detritus tanks*, septic tanks, bacterial filters, conduits, and other works required to be done at the proposed sewage works, which are to be constructed near Lund Lane, about 3 miles east of Barnsley, for the Town Council. Drawings, specifications, and bills of quantities may be obtained on payment of £10 to A. Newsum, borough accountant, Barnsley, and tenders, properly sealed and endorsed, are to be delivered to J. H. Taylor, M.Inst.C.E., borough surveyor (engineer for the scheme), Manor House Offices, Barnsley, not later than 10 a.m. on Nov. 19.

Nov. 19. Glasgow.—*Construction of Sewer No. 6* (being a 3-ft. by 2-ft. brick sewer), extending along Dumbreck Road from Manor Road to Fleurs Avenue, a distance of about 825 lineal yards. Plans, specifications and working drawings may be seen, and specifications and schedule of quantities and forms obtained, on application to the City Engineer, City Chambers, 64, Cochrane Street, Glasgow, on payment of a fee of £5 5s. Sealed offers, marked outside "Tender for Sewer No. 6," must be lodged with A. W. Myles, town clerk, City Chambers, Glasgow, not later than Nov. 19. The resident engineer will meet intending offerers in Paisley Road, at Ibrox Station, at 11 on Nov. .

Nov. 20. Milton, Hants.—*Provision of a sewerage system* for the parish of Milton, Hants, for the R.D.C., of Lymington. The specification is for the following works:—For the construction of about 1,180yds. of 6-in., 4,900yds. of 9-in., and 1,250yds. of 12-in. stoneware pipe sewers, and about 40yds. of 9-in. and 150yds. of 12-in. cast-iron sewers, all necessary manholes and flushing chambers, and for the erection of 13 ventilating columns; for the construction of sewage-disposal works, comprising of grit chamber, septic and storage tanks, 12 contact beds, and a storm-water overflow drain and filter bed. Copies of the specification and bill of quantities can be obtained and plans seen at the offices of the Clerk to the R.D.C., Lymington, Hants, or at the offices of H. C. H. Shenton, engineer, of the firm of Messrs. Anson & Shenton, of 28, Victoria Street, Westminster, S.W., on payment of a cheque of £5. Tenders must be received by J. D. Rawlins, clerk, at the office of the Council, Lymington, Hants, before 11 a.m. on Nov. 20.

Dec. 19. Herne Bay.—*Construction of about $3\frac{1}{4}$ miles of brick and concrete and pipe sewers*, with all the necessary manholes, ventilators, and flushing arrangements, the construction of a pumping station, cottage, and buildings, and the provision of pumping machinery for the U.D.C. Plans and specification of the works may be seen and the form of tender obtained at the office of B. Latham, M.Inst.C.E., Parliament Mansions, Victoria Street, Westminster, engineer for the works, or at the office of F. W. J. Palmer, surveyor to the Council, at his office at Herne Bay. The quantities of the several works have been taken out by C. E. Bruges, A.M.I.C.E., 1, Victoria Street, Westminster, and may be had on application either to the engineer or surveyor on deposit of £10. Sealed tenders, on the form supplied attached to the quantities, endorsed "Tender for Sewerage Works," are to be delivered at the office of J. Jubb, clerk to the U.D.C., at Herne Bay on or before noon of Dec. 19.

MISCELLANEOUS.

Nov. 17. Accrington.—*Supply of manganese steel points*, crossings, special track work, tie-bars, fish bolts, &c., for the Borough Corporation Tramways. Specifications, drawings, forms of tender and further particulars may be obtained on application to W. J. Newton, Assoc.M.Inst.C.E., borough engineer, Town Hall, Accrington, on payment of a deposit of £2 2s. Sealed tenders, endorsed "Tramway Points and Crossings" or "Tie-Bars and Fish Bolts," as the case may be, to be delivered to A. H. Aitken, town clerk, Town Hall, Accrington, not later than Nov. 17.

Nov. 19. Dublin.—*Supply of general stores*, including car fittings, iron, steel, castings, oils, paints, glass, brushes, ironmongery, electric supplies, timber, &c., for the year ending Dec. 31, 1907, for the Dublin United Tramways. Forms of tender (price 2s. each), conditions, and all information can be obtained, and patterns seen, at the Secretary's Office, 9, Upper Sackville Street, until Nov. 12. Tenders, sealed and marked on the outside "Tenders for Stores," and addressed to the Chairman, to be lodged with R. S. Tresilian, secretary, on or before Nov. 19.

Nov. 19. Dublin.—*Supply of the following stores* for the Directors of the Midland Great Western Railway of Ireland Company. The contracts to commence from Jan. 1 next, and terminate on Dec. 31, 1907:—(4) brass and copper tubes, plates, sheets, &c.; (5) brass cocks and gas fittings; (6) bricks, flags, tiles, &c.; (11) cements; (13) copper, tin (ingots), lead, gunbarrel, &c.; (15) glass; (17) iron castings; (18) do. Staffordshire bars, plates, wires, &c.; (19) do. Yorkshire do.; (20) ironmongery; (26) springs, steel and files; (27) steel tyres, axles and plates; (28) timber, &c. Forms of tender can be obtained, on payment of 6d. each, from the Storekeeper, General Stores Department, Broadstone Station, Dublin. Patterns and samples can be inspected at the same place on and after Nov. 1, between the hours of 10 a.m. and 4 p.m., except Saturdays. Contractors cannot be allowed to tender to supply goods to their own patterns, nor can the company's patterns be sent away for inspection. The directors will not consider any tender unless furnished on the company's forms; nor any tender in which any alteration of the form has been made. The tenders to be sent in by post, sealed and endorsed on the envelope, "Tender for Stores, Form No. ...," and addressed to "The Chairman, Broadstone Station, Dublin," so as to reach him on or before 10 a.m. on Nov. 19.

Nov. 26. London.—*Supply during 1907 of the following stores* for the L.G. Omnibus Company, Ltd.:—(a) timber; (b) ironmongery, coachmakers', engineers', saddlers', and farriers'; (e) oil, glass, grease and sundries; (k) building materials; (l) gas and water fittings; (m) enamelled iron plates. The schedules will be ready Nov. 12, and may be obtained at the company's coach factory, North Road, Caledonian Road, N., on payment of 2s. 6d. each, where samples also will be on view Nov. 14, 15 and 16, between the hours of 10 a.m. and 5 p.m. Contractors are requested to call and examine the samples before tendering. Sealed tenders, endorsed "Tender for Stores," should be addressed to the Directors, 6, Finsbury Square, E.C., not later than noon, Nov. 26.

TOO LATE FOR CLASSIFICATION.

Nov. 12. Cleethorpes-with-Thrunscoe.—*Construction of a small mortuary* and alterations to the foreman's office to form Inquest-room, for the U.D.C. Forms of tender may be obtained and plans and specifications may be seen on application to E. Rushton, engineer and surveyor to the Council, Surveyor's Office, Council House, Cleethorpes, between the hours of 9 and 12 in the morning. Sealed tenders, addressed to the Chairman of the General Purposes Committee, and endorsed "Tender for Mortuary," to be sent in to the office of the clerk to the Council not later than 12 noon on Nov. 12.

Nov. 12. Corbridge.—*Erection of out offices*, boundary fences, and the construction of a drainage system at a temporary iron school building, which it is proposed to erect at Corbridge for the Education Committee. Copies of specification and forms of tender for the work may be obtained on application to C. Williams, secretary to the Education Committee, Pearl Buildings, Newcastle-upon-Tyne, and a plan of the proposed work can be inspected at the offices of the committee at the same address, or at the office of the Corbridge Parish Council, situate in Middle Street, Corbridge, any day between the hours of 10 a.m and 4 p.m. Tenders, endorsed "Tender for Boundary Fencing, &c.," must be forwarded to Mr. Williams not later than 4 p.m. on Nov. 12.

Nov. 13. London.—*Reconstruction of the bridge* carrying Hampstead Road over the London and North-Western Railway, near Euston Station, in the borough of St. Pancras, in the Administrative County of London. Persons desiring to submit tenders may inspect the drawings and obtain the specifications, bills of quantities, form of tender, and other particulars upon application to the chief engineer, M. Fitzmaurice, C.M.G., at the County Hall, Spring Gardens, S.W., upon payment to the cashier of the Council of the sum of £3. Full particulars may be obtained on application at the County Hall, Spring Gardens, previously to the payment of the fee for the specification, &c. Tenders must be upon the official forms, and the printed instructions contained therein must be strictly complied with. Fair wages clause. Each tender is to be delivered at the County Hall in a sealed cover, addressed to "The Clerk of the London County Council, Spring Gardens, S.W.," and marked "Tender for Reconstruction of Bridge carrying Hampstead Road over the London and North-Western Railway." No tender will be received after 10 a.m. on Nov. 13.

Nov. 14. Pontypridd.—*Erection of Park School*, Treforest, for the accommodation of 300 boys, 300 girls, and 300 infants, together with cookery and manual instruction centres. Plans and specification can be seen at the office of P. R. A. Willoughby, A.M.I.C.E., surveyor to the Council, and from whom bills of quantities can be obtained on payment of £3 3s. The bill of quantities must be sent in under seperate cover, with the name of the person tendering on the outside, under seal, to the Surveyor, and will be returned to him unopened in the event of his tender not being accepted. Tenders, on the prescribed form, to be sent under seal to D. Milton Jones, secretary, Municipal Buildings, Pontypridd, not later than Nov. 14.

Nov. 17. Worcester.—*Additions, &c., to the electricity generating station* in the Hylton Road, for the Electricity Committee of the Corporation. Persons desirous of submitting tenders must forward their names and addresses to the City Architect, Worcester Chambers, Pierpoint Street, Worcester, on or before Nov. 8. The plans and specifications may be inspected and other particulars obtained of H. Rowe, city architect, Worcester, where tenders (on forms to be supplied) are to be delivered on or before Nov. 17. Fair wages clause.

Nov. 19 Bristol.—*Supply during the year 1907* the following tools and stores:—*Castings, *ironmongery, cement, drain pipes, paints, *oils and candles, for the Sanitary and Improvement Committee of the Corporation. Specifications and forms of tender may be obtained at the offices of the City Engineer, 63, Queen Square, on payment of 10s. Local tenders only will be accepted for those marked *. Tenders must be sent in the envelopes provided to 63, Queen Square not later than 1 p.m. on Nov. 19.

Nov. 19. Cupar.—*Contract No. 1: Construction of a storage reservoir*, the laying and jointing of 4 and 3-in. diameter cast-iron pipes, the fitting of valve, hydrants, and other relative works, for the Fife C.C. Drawings may be seen and copy of specification and schedule of quantities and form of tender obtained from Bruce, Proudfoot, & Macrae, civil engineers, 67, Crossgate, Cupar, upon payment of £2 2s. Contractors will be shown over the proposed line of pipes, &c., upon giving one day's notice to the engineers. The form of tender, specification, and schedule of quantities must be delivered in a sealed cover to W. D. Patrick, district clerk, County Buildings, Cupar, marked "Kettle Contract No. 1," not later than 10 a.m. on Nov. 19.

No date. Wolvey.—*Erection of farm buildings* at Wolvey, for H. F. J. Coape-Arnold, Esq., of Wolvey Hall, Hinckley. Bills of quantities may be obtained upon application to T. F. Tickner, M.S.A., architect, High Street Chambers, Coventry.

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—adjudication.]

DURING THE WEEK ending November 2nd thirty-three failures in the building and timber trades in England and Wales were gazetted.

G. HORN, builder, Enfield. R.O., Oct. 22.

D. JONES, painter, Barmouth. R.O., Oct. 22.

T. MAY, contractor, Plymouth. R.O., Oct. 23.

H. C. GOSS, builder, Torquay. R.O., Oct. 26.

D. T. CARTER, builder, Chingford. R.O., Oct. 22.

H. SCOTT, timber merchant, Derby. R.O., Oct. 25.

T. R. BRICE & CO., builders, Chingford. R.O., Oct. 22.

WILKINSON BROTHERS, builders, Palmers Green. R.O., Oct. 22.

A. BARTLEMAN & SON, builders, Stow-on-the-Wold. R.O., Oct. 23.

W. SIGGENS, builder, Washington. P.E., Newcastle-on-Tyne C.C., Nov. 22, at 11.

J. HUGHES, builder and contractor, Conway. Liabilities, £179; deficiency, £58.

O. ODELL, builder and contractor, Wheathampstead. Liabilities, £1,852; assets £462.

J. REES, builder and contractor, Llandebie. P.E., Guildhall, Carmarthen, Nov. 7, at 12.

J. HARLOW, builder, Burton-on-Trent. Gross liabilities, £12,821; £3,346 expected to rank; net assets, £1,960.

H. PEMBERTON, builder and contractor, Derby. First meeting, O.R.'s, Derby, Nov. 7, at 11. P.E., Derby C.C., Nov. 13, at 11.

JOSEPH G. FIRBANK, LTD., railway contractors, London. Gross liabilities, £143,611; £81,354 expected to rank; assets nil.

J. HARLOW, builder, Burton. Gross liabilities, £12,822; £3,347 expected to rank; assets £1,960; deficiency, £1,387.

HICKS & SON, builders, Bedminster. First meeting, O.R.'s, Bristol, Nov. 14, at 11.30. P.E., Guildhall, Bristol, Nov. 30, at 12.

W. TAYLOR & CO., builders and contractors, Tamworth. P.E., Birmingham C.C., Nov. 28, at 2. R.O., Oct. 9 (amended notice).

J. E. HARDWICK, joiner and builder, Spital. First meeting, O.R.'s, Liverpool, Nov. 7, at 2.30. P.E., Birkenhead C.C., Nov. 13, at 11.

T. WILSON, builder, Folkestone. First meeting, O.R.'s, Canterbury, Nov. 8, at 9.15. P.E., Guildhall, Canterbury, Nov. 8, at 10

G. FAWLEY & SONS, plumbers, Halifax. First meeting, O.R.'s, Halifax, Nov. 7, at 2.30. P.E., Halifax C.C., Nov. 12, at 2. R.O., Oct. 24.

F. O. FARRELL, builder and contractor, Leeds. First meeting, O.R.'s, Leeds, Nov. 7, at 11. P.E., Leeds C.C., Nov. 13, at 11. R.O., Oct. 25.

J. RINGROSE, builder and contractor, Stanningley. First meeting, O.R.'s, Bradford, Nov. 7, at 3. P.E., Bradford C.C., Nov. 21, at 10. R.O., Oct. 25.

New Companies.

BARKER & JONES, manufacturers of bricks, tiles, &c. Capital: £3,005.

LATIN COUNTRIES CEMENT CO., 139, Cannon Street, E.C. Capital: £65,000.

THOMAS TATTERSALL, builder and contractor, Manchester Road Saw Mills, Haslingden. Capital: £5,000.

COPINGERS, to acquire the business of electrical engineers and contractors carried on as Copinger & Co., 43, Lower Mosley Street, Manchester. Capital: £2,000.

WHITMORE & SON, timber merchants, Wharf Saw Mills, Fordham Road, Bury St. Edmunds. Capital: £5,000.

J. T. TUSTING & SONS, dealers in bricks, tiles, and other building materials, Cambridge and Norwich. Capital: £3,000.

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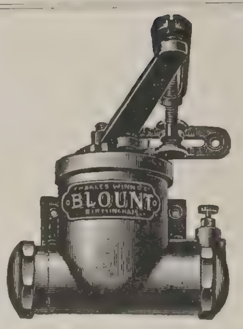

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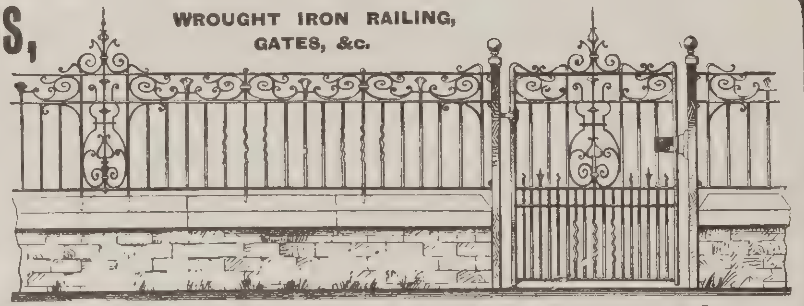

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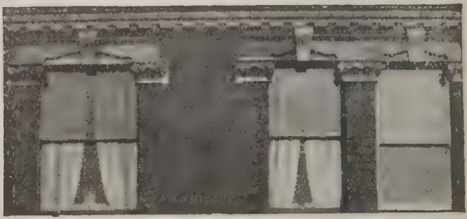

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CONCRETE AND STEEL SUPPLEMENT (MONTHLY).

CONCRETE AGGREGATES.

By Thomas Potter.

Concrete, in an ordinary way, is a mixture of two materials, usually known as the aggregate and the matrix—two words not very suggestive as to meaning, but accepted possibly for want of better.

The aggregate may be any reasonably hard material which can be obtained of a proper consistency, which is of a suitable size or easily convertible to a suitable size, is more or less porous, and for which the matrix has an affinity, the matrix being usually lime, Portland cement, or compounds of which the basis is either carbonate of lime or sulphate of lime. Aggregates should possess cohesiveness in conjunction with the matrices as a binding material, whichever they may be, and a capacity for resisting compressive stress.

More or less fitting aggregates for concrete are obtainable in nearly all localities, and as a result those which can be procured near to where wanted for use are usually selected; but

discrimination is necessary

in this direction, for there is much difference in the character of materials that pass by the same name. A specification may describe, for instance, that the aggregate is to be clean pit or river gravel, to be obtained locally, and this description may lead to difficulties, for it may be clean in a sense, but mixed with clay excellent in its way for garden paths and the like, but totally unsuited for making concrete. Nor does it follow that an aggregate that is well adapted for one purpose is equally so for others. For instance, Thames ballast is an excellent aggregate for concrete in foundations, but one of the worst for suspended floors, by reason of its weight and inability to withstand the effects of fire. This applies also to pit gravel, crushed flints from a chalk subsoil, and most quarry stones.

But whatever the nature

of the aggregate, it should, if obtainable, possess the following qualifications:—It should be angular in form, that its particles may interlock with each other and form a homogeneous mass, and this is not possible unless it consists of many intermediate sizes, from that of coarse sand to the largest permissible (the latter depends upon the purpose the concrete is for), as in its soft state it will adjust itself to form a homogeneous mass much more readily in a wide foundation, or thick wall, than it will in a narrow foundation or thin wall, enabling a proportion of the aggregate to be considerably larger in the former case than in the latter.

The best shape

for an aggregate may be better described, perhaps, as cubes of varying sizes, with all their angles and corners knocked off. The worst possible form of an aggregate is where it is comparatively large and uniform in size, or flaky, such, for instance, as stone chippings, or old bricks broken with hand hammers—a usual custom in many places. Concrete made with an aggregate of this kind is similar to a honey-comb, and the greater portion of the matrix is rendered useless.

To avoid this, we sometimes read that the aggregate is to be composed of, say, five parts of broken bricks, three parts of sand and one of cement, the sand being necessary to fill up the interstices in the bulk of the aggregate, which it probably does; but Mr. Grant's experiments for the Metropolitan Board of Works conclusively proved that when one part of cement is mixed with three parts of Thames sand it forms a mortar 33 per cent. only of the strength of neat cement. This conclusively proves that, although a proportion of coarse sand is necessary to obtain perfect homogeneity, no more than is actually necessary for the purpose should be employed. This condition, however, applies only where Portland cement is the matrix; when hydraulic-ground lime is used the reverse is the case. Major-General Pasley and others found from actual experiments that it reaches its maximum strength when mixed with two to three parts of sand.

If the aggregate is uniformly small

the result, where cement is the matrix, is a weak mortar instead of concrete. If a large number of small elements of any materials have to be cemented together to form a block of given dimensions, it is self-evident that the cement must have a much larger superficial area to cover than if they were larger in size. It may be that where the aggregate can only be obtained of small size, hydraulic-ground lime may be used with advantage, both as regards cost and strength, in places like foundations for walls or paving. The aggregate should be clean. This is of great importance, and easily determined if a suspicious aggregate is washed in a bucket of water and well stirred. If some test blocks of cement are made with this water and others with quite clean water, both from the same sample of cement, and tested in a cement testing machine under equal conditions, no further evidence of the necessity will be required. A good illustration of the value of a clean aggregate possessing a diversity of size can be seen any day in the streets of London where the roadways are being broken up for gas or water pipe repairs. The concrete below the paving is Thames ballast, and, although no great exactitude or care is usually apparent in the mixing and otherwise, three or four men with sledge hammers and steel wedges remove with difficulty, and after a deal of pounding, fragments of the concrete, which has the tenacity of solid rock. Thames ballast is not quite an ideal aggregate; its particles are rounded by attrition and not so angular as desirable, but it is clean and its proportions well distributed.

There is another factor

in the result, however, and this is that quickly after the concrete is deposited in place wood blocks or asphalt is laid thereon, which effectually excludes the air necessary for hardening; and as the retardation of setting increases the ultimate strength, and the only air that can reach it is from the soil beneath—*i.e.*, ground air—it is possibly years before the latter occurs.

In many aggregates, more especially those that have passed through fire—as boiler ashes, crushed brick rubbish, pottery, &c.—there is usually a film of fine dust which clings to the particles and can only be eliminated by washing. This is very seldom done, but, where circumstances permit, the percentage of gain in strength arising therefrom is of greater value than the extra cost of labour. An illustration of this may be found in smiths' ashes, which contain a large amount of a dusty element and particles of unburnt coal. Mr. Grant made a number of experiments to ascertain the comparative value of various sands when used to make cement mortar, with the result that smiths' ashes mortar was only 25 per cent. of the strength of mortar made with sand from burnt clay ballast, 50 per cent. from a clean pit sand and sea sand, and 33 per cent. from Portland stone ground to sand. A further result of these experiments was that coarse sand invariably gave better results than fine.

The materials in common use

more or less suitable as aggregates are Thames and other river gravels, pit gravels, stone chippings, flints, débris from brickyards and potteries, materials from walls of old buildings, blast furnace slag—the residue in smelting iron ore, breeze from gas works, boiler and furnace ashes, burnt clay, and local products of a similar character. If the smaller element predominates, a portion should be screened therefrom to bring it within the description previously given; on the other hand, if some portions are considered too large, they should also be screened out, broken, or otherwise removed. If generally the material is altogether too big, it should be crushed by a Blake, Marsden or other suitable machine. This is usual with slag, débris from old buildings, brickfields and potteries, and occasionally with quarry refuse. Materials crushed in this way have a suitable consistency for an aggregate without any addition thereto or subtraction therefrom, but I have, in cases where sand was wanted and none available, had the crusher set fine, to produce a larger proportion of the sandy element than was advisable, to enable a portion to be abstracted for mortar making.

Size of Aggregate.

As to what should be the extreme size of the aggregate, no definite rule can be laid down. It is one of the numerous things which occur in connection with the use of concrete that cannot be standardised. For a concrete wall or partition, say, 6ins. thick, obviously no portion of the aggregate should be larger—under ordinary circumstances—than would pass an inch and a quarter cross mesh sieve; on the other hand, for foundations 4ft. to 5ft. wide, the larger the better if homogeneity can be secured; and a knowledge of this is only arrived at by some experience. The surface appearance of concrete is not direct evidence of want of homogeneity; it may appear rough, and suggestive of unsoundness below the surface; but if a deep cut is made across the trench, lintel or wall after it is hard enough to permit this to be done without fracture, it will possibly be found of quite a different character to that which its surface appearance seemed to indicate.

It is generally assumed that a moderately porous aggregate will best ensure the adhesion of its particles, and, if capable of resisting a heavy compressive stress, it should be the best. This is only to a certain extent correct, for it has been proved that often the very opposite is the case. Major-General Pasley made some experiments in this direction by cementing together blocks of various materials and ascertaining the tensile strain which would separate them. The blocks, measuring 10ins. by 4ins. by 4ins., were cemented together with Roman cement, and tested at the end of eleven days, with the following result:—

Experiment No. 1.

	Pounds.
Bricks	1,359
Kentish rag stone	1,349
Bath stone	1,100
Cornish granite, polished	928
Do. do. not polished ...	900
Portland stone	856
Cragleith stone	855
Yorkshire stone	823

The result differs a good deal from experiments made by Mr. Grant for the purpose of ascertaining the best aggregates for concrete for the Thames Embankment and their various compressive strengths. Cohesive strength and compressive strength do not always go together, as the following experiments for ascertaining the crushing stress when compared with No. 1 will prove. The size of the blocks were 6-in. cubes; they were moulded on November 6th, 1867, and tested November 6th, 1868; the proportion was one part of Portland cement to eight parts of the respective aggregates of a suitable consistency, and both by measure, the blocks being compressed.

Experiment No. 2.

	Kept in air.	Kept in water.
	Tons.	Tons.
Portland stone	33	29
Pottery	22	23
Slag	19½	13½
Granite	19½	16
Glass	18	17½
Flints	17½	20
Ballast	13½	13½

Where the materials were not compressed the result was as follows:—

Experiment No. 3.

	Kept in air.	Kept in water.
	Tons.	Tons.
Portland stone	24½	19½
Pottery	18	18
Granite	14½	13½
Flints	14	12½
Glass	13½	11½
Slag	14	9½
Ballast	12½	11

These experiments show that where compression or a gentle impingement of the concrete can be practised the strength is considerably increased; but this is not always possible.

Other experiments made by Mr. Grant showed that certain concrete materials increased in strength, when the proportion of cement was increased, much more rapidly than others. For instance, and in the following order, 25 per cent. more cement increased the strength of the concrete 50 per cent. and over when made from (1) granite, (2) ballast, (3) slag. Portland stone chippings, nearly always stood first in the order of merit when tested for compressive strength in the case of many hundred experiments made by Mr. Grant; but the result of Nos. 2 and 3 experiments is puzzling—that glass should be an aggregate be nearly as strong as granite, more so than all.

Glass as an Aggregate.

We are not told what form of glass was used, but it must have been difficult to obtain any which would form a homogeneous mass. There is little or no porosity or capability of absorption in glass to afford a key for the cement. On one occasion, being desirous of making some cement slabs which should be quite true and smooth, I used a number of plate-glass squares as moulds or frames for the purpose, and, although their surfaces were oiled to prevent adhesion, it was impossible to liberate the cement castings; both the latter and the glass moulds had to be broken up.

Major-General Pasley found a similar peculiarity with hard stone and marbles—namely, that when their surfaces were worked perfectly true and smooth and cemented together, they resisted a pulling strain with a view to separate them equal to similar stones and marbles with their surfaces roughened or jagged to give a key for the cement, as is generally practised in masonry.

Two Years to Acquire Maximum Strength.

Another series of experiments made by Mr. Grant was to ascertain the proportionate rate neat cement, and half cement and half sand increased in strength, with the result that each reached its maximum strength in two years, but not before; and we may reasonably assume, therefore, that concrete does not attain its full strength until the cement has also, and this may not happen in practice until a much longer period than with test blocks, as, for instance, when it is of unusual thickness and air permeates but slowly, or the aggregate may be of a non-porous character. I remember an occasion when a comparatively newly-built concrete wall, 4ft. thick, had to be removed; the outside portion was detached with some difficulty, but as the centre was approached it became softer, and at that point could be broken apart with the hand.

Coke Breeze.

Mr. Grant on no occasion appears to have experimented with boiler ashes, furnace clinker, or coke breeze. Their appearance is not in their favour as aggregates; coke breeze more especially is somewhat small and soft, and its particles not sufficiently diverse in size to expect good results therefrom. Until recent years, and when it began to take the place of Thames ballast for floors, it was considered a waste product which the gas companies were glad to give away, and when this did not happen, it was taken away in vessels and dumped down wherever dumping ground was available, or pitched into the sea. Messrs. Kirkaldy & Son's experiments have, however, quite changed the opinion of its value as an aggregate; they made experiments for the West Ham Corporation a year or two since with coke breeze as an aggregate, and for comparison with stock brickwork in mortar, with the following result:—

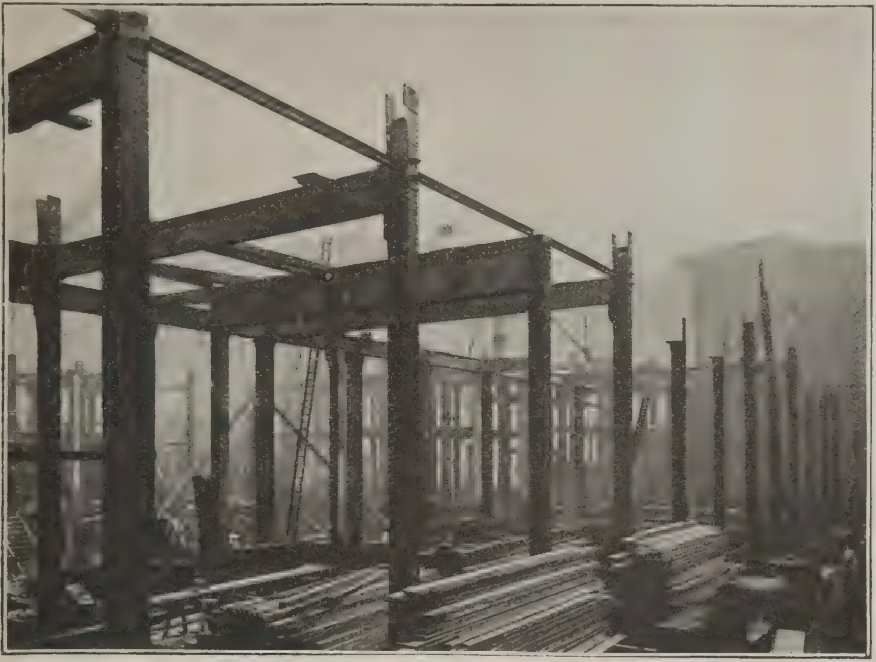
Experiment No. 4.

		Cracked slightly.		Crushed.	
		lbs. per sq. in.	Tons per sq. ft.	lbs. per sq. in.	Tons per sq. ft.
2895	Brick pier A 18″×18″×6 courses high, stock bricks set in blue lias lime mortar ...	730	46.9	730	46.9
2896	Brick pier B 18″×18″×6 courses high, Harold Wood bricks set in blue lias lime mortar	1099	70.7	1168	75.1
2897	Concrete block C 18″×18″×18″ 6 parts coke breeze, 1 part Portland cement, 2½ years old	2037	131.0	2037	131.0

This is an extraordinary result so far as coke breeze is concerned, and about equals the crushing strength of gault bricks.

(To be concluded.)

WALDORF HOTEL, ALDWYCH, LONDON: FOUNDATION WORK.



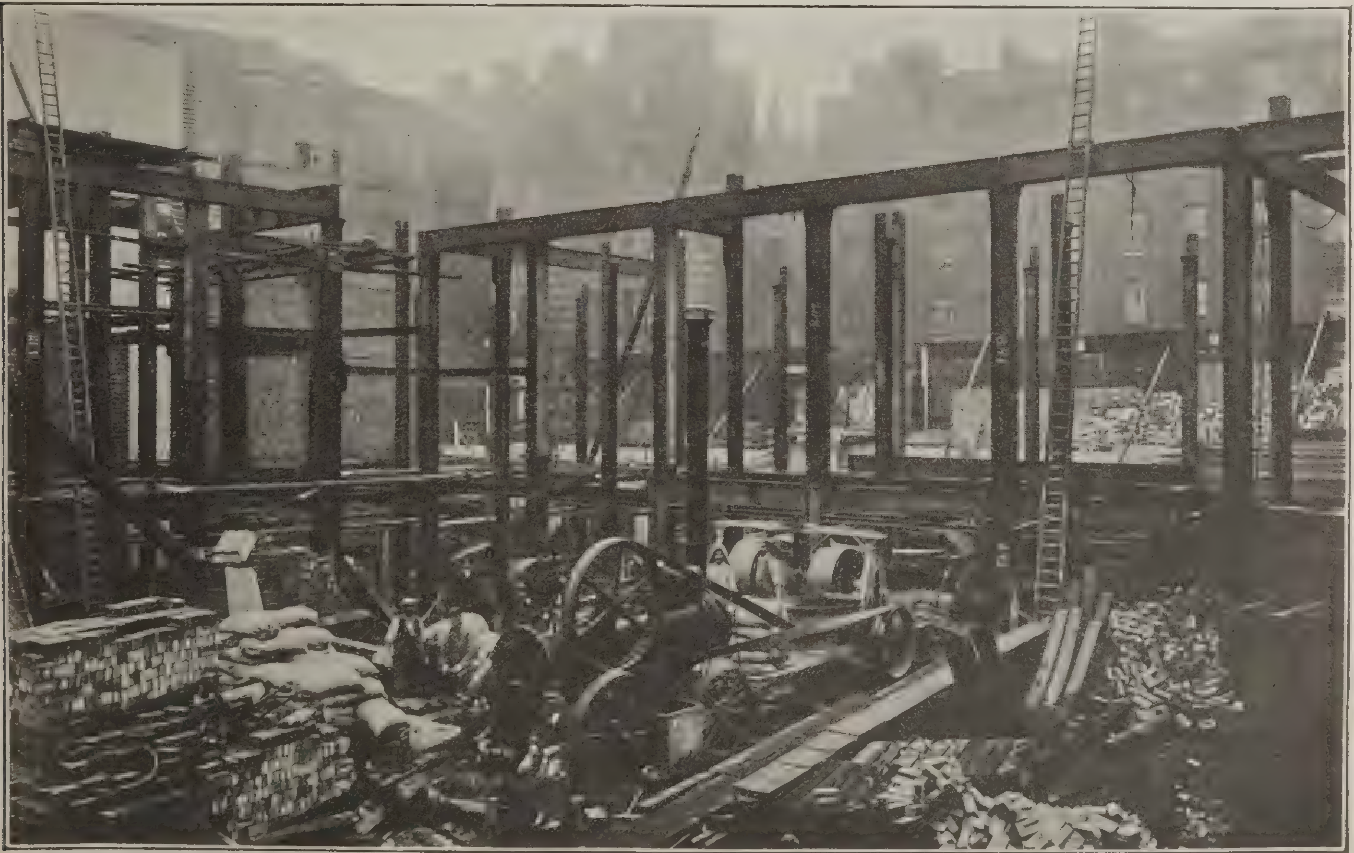
WALDORF HOTEL: STEELWORK AT REAR OF SITE.

THE WALDORF HOTEL.

After considerable delay the building of the Waldorf Hotel in Aldwych, London, has now been resumed. The view on the preceding page showing the foundation work was taken nearly a year ago. The job remained very much in that condition till quite recently, but work has now been recommenced in earnest and everything is being pushed on with astonishing rapidity. The views on this page show the present condition of the steelwork, which is designed as a skeleton framework on the American pattern familiar to our readers: in fact, it was designed by Mr. S. Bylander and is being erected by the Waring White Building Co., who were jointly responsible for the Ritz Hotel and the "Morning Post" building. Within the past two months the construction has made rapid strides, and the granite facing to the hotel on the Aldwych front is already well started, while bricklayers are busy at several parts of the site. Very much the same method of erection is being employed as at the Ritz Hotel. We shall publish further illustrations and particulars of the Waldorf Hotel in future supplements. The architects are Messrs. A. Marshall Mackenzie, A.R.S.A., & Son.

RAPID CONSTRUCTION IN REINFORCED CONCRETE.

On the next page we give three photographs showing the different stages of a new building which has been erected at Carlisle for Messrs. Hudson, Scott & Sons, Ltd., as a new wooden case-making shop. The Kahn system of reinforced concrete was used throughout, and this building furnishes a striking example of what can be done in the way of rapid construction under this method. Fig. 1 shows the condition of the building after two weeks' progress, Fig. 2 after four weeks, and Fig. 3 after six weeks. In the last-mentioned photograph the constructional part of the work is practically completed. A novel method of handling the concrete was used, which is shown in the foreground of the pictures. Another feature of the building was the small number of columns used. The bays supported by the columns were 20ft. square. The main carrying beams of 20ft. span were 12ins. by 19ins. below the floor slab, and the secondary beams of 19ft. span were 10ins. by 11ins. below the floor slab. The reinforcement for the main beams consisted of two $1\frac{1}{4}$-in. Kahn trussed steel bars, and the reinforcement for the secondary beams of two 1-in. Kahn trussed bars. The floor slab was 5ins. thick on each storey, and the roof slab was 4ins. thick. The columns supporting the roof were 10ins. square and increased to 16ins. square on the ground floor. The walls as well as the stairways throughout were constructed of reinforced concrete. The result is a thoroughly fireproof building with a minimum rate of insurance for the owners. The contractors were Messrs. Stephen Easten & Co., Ltd., and the engineer who designed the work was Mr. H. W. Taylor, A.M.I.C.E., to whose enterprise the speed of erection was due.



WALDORF HOTEL: GENERAL VIEW OF STEELWORK. (Photograph taken on November 1st.)

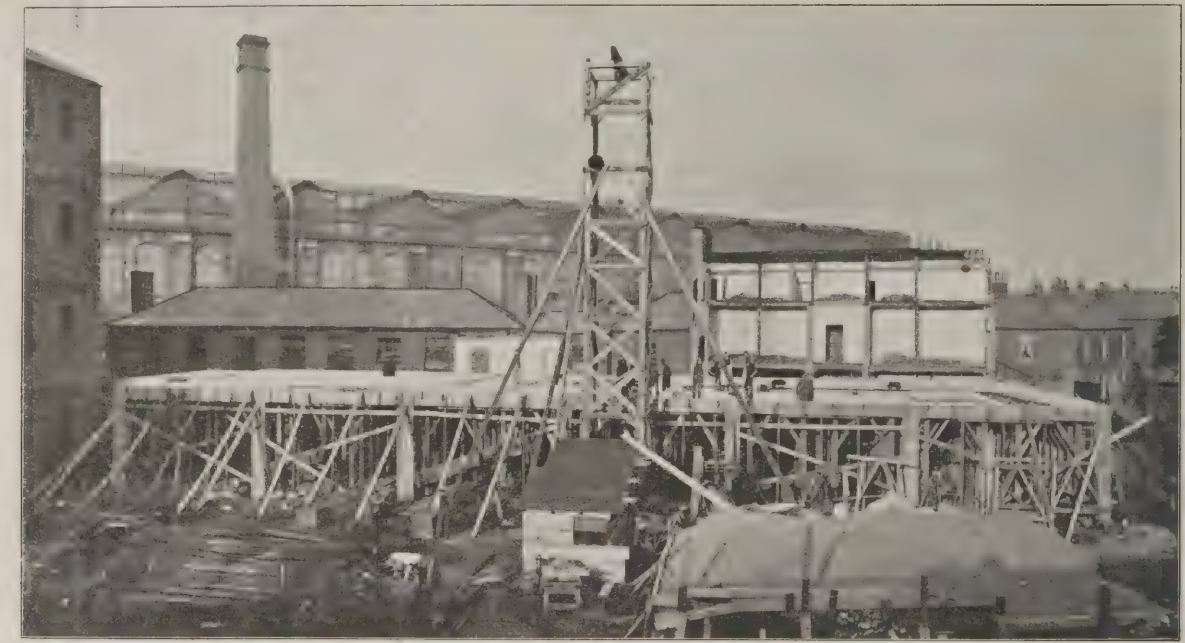


Fig. 1: after 2 weeks.

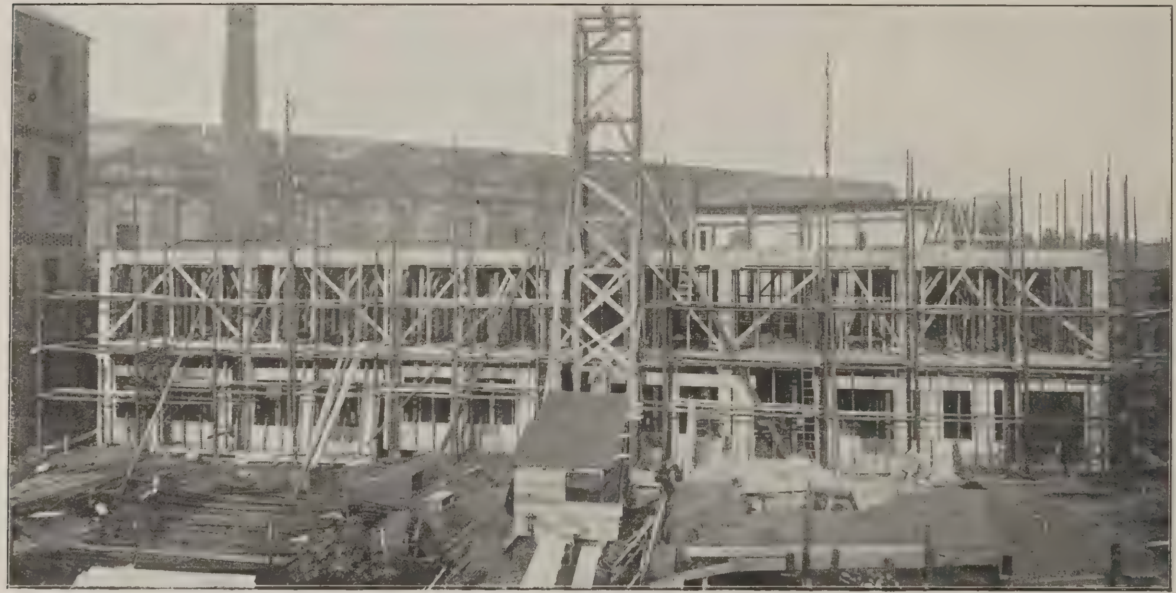


Fig. 2: after 4 weeks.

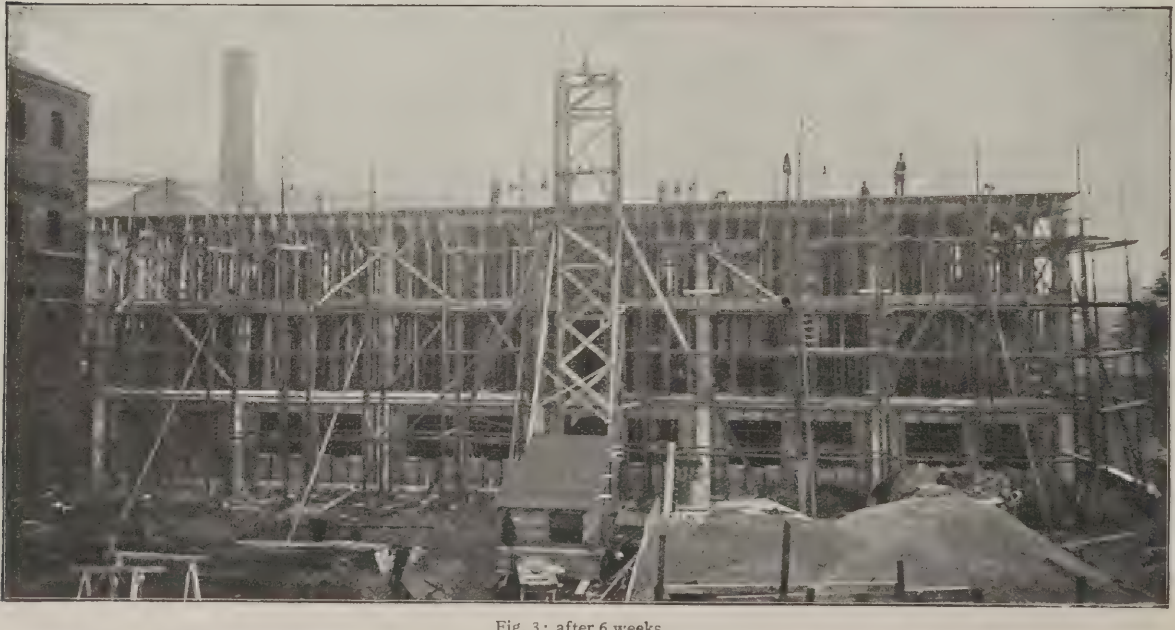


Fig. 3: after 6 weeks.

REINFORCED CONCRETE FACTORY FOR HUDSON, SCOTT & SONS, LTD., CARLISLE.

A REINFORCED CONCRETE FLOOR TEST.

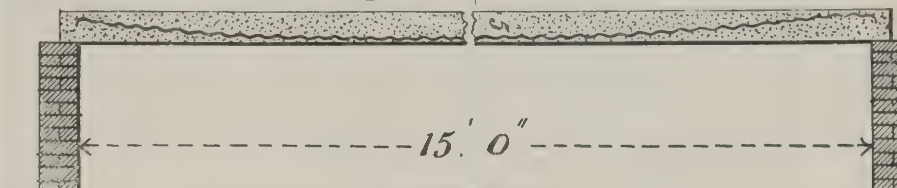
We give particulars below of an interesting test which was made recently by Messrs. Potter & Co., Ltd., of 66, Victoria Street, on a floor 22½ft. by 15ft., and only 5ins. thick, without any intermediate supports or steel or reinforced concrete beams under :—

Total area clear of all supports—337 ft. super.
Thickness of floor—5 inches.
Steel reinforcement—1⅓lbs. per ft. super.
Total weight of steel reinforcement—448lbs.
Constructed on April 18th.
Loaded on July 18th with 59lbs. per ft. super.
 Result—Deflection ¼in.
Load increased on July 19th to 118lbs. per ft.
 super. Result—Total deflection ⅓in.
Deflection on July 21st—¾in.
Loaded on Agust 9th to 254lbs. per ft. super.
 Result—Total deflection 1¼in.

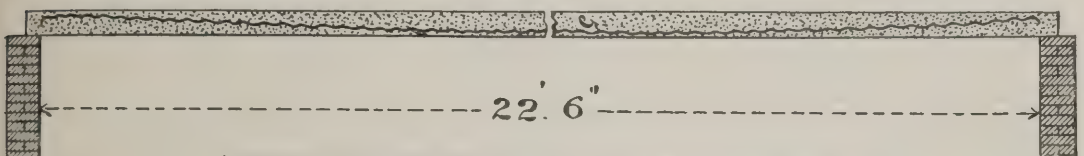
The foundations and supports having sunk at one corner 4½ins., the load was not increased. A fine crack was apparent on the underside, starting at one corner diagonally, of 8⅓ft. in length; since that date other fine cracks have appeared.

On October 6th the floor load had been maintained with no further results.

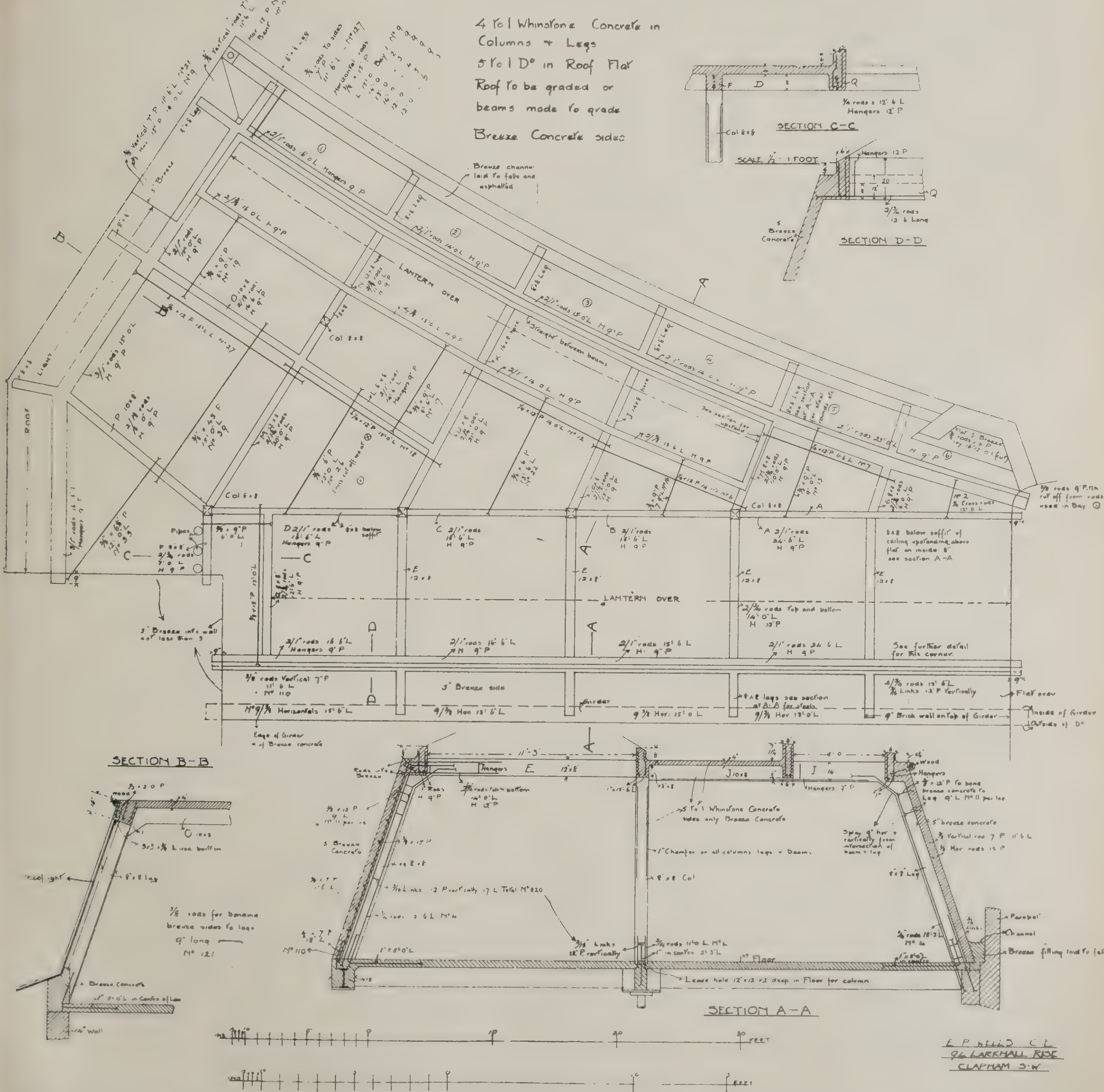
It would be interesting to learn if any other test floor has been made of similar dimensions and thickness, with such little reinforcement. Messrs. Potter & Co. do not necessarily recommend such large unsupported floors in general practice.



CROSS SECTION.



A REINFORCED CONCRETE FLOOR TEST: LONGITUDINAL SECTION.



ANNEXE, "DUNDEE COURIER" BUILDING, DUNDEE. WORKING DRAWING No. 7, SHOWING FRAMING PLAN AND SECTIONS OF ROOF CONSTRUCTED IN REINFORCED CONCRETE, BY STUART'S GRANOLITHIC STONE CO., LTD. E. P. WELLS, ENGINEER. NIVEN & WIGGLESWORTH, ARCHITECTS.

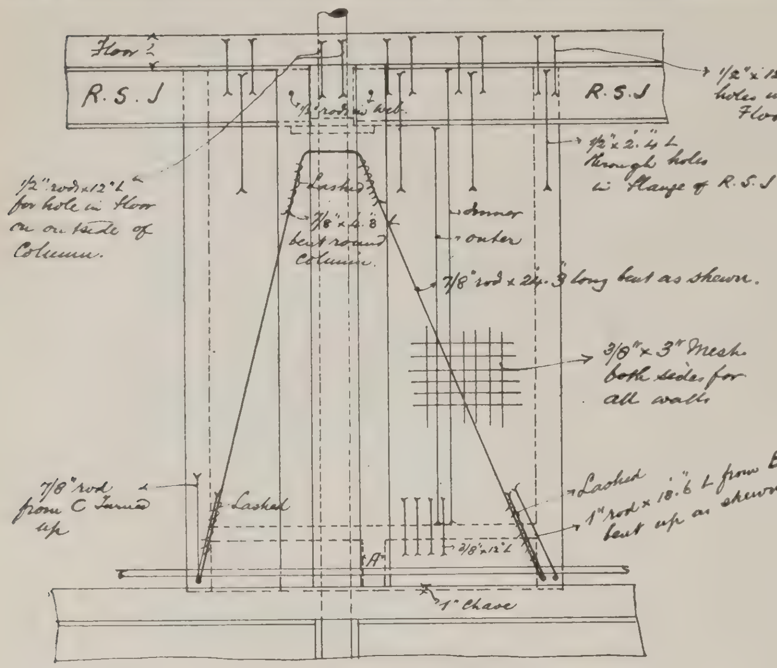
A REINFORCED CONCRETE NEWSPAPER OFFICE.

In the "Concrete and Steel" supplement to our issue for October 10th we published an article on the reinforced concrete construction of the annexe to the "Dundee Courier" building, recently erected in Dundee, together with some working drawings supplementary to others published in supplements to former issues dated May 25th and June 20th. We now give three further working drawings, completing our illustration of this important example of this form of construction.

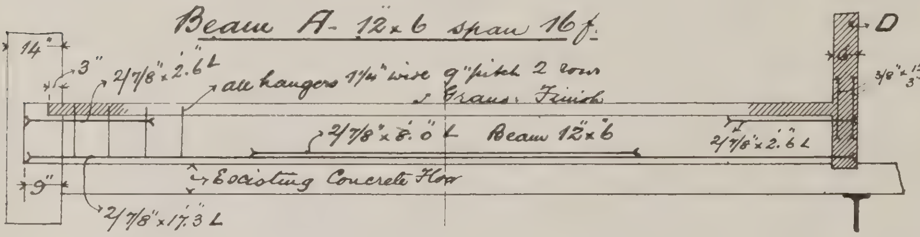
The complete set of working drawings which we have published in our columns is as follows:—

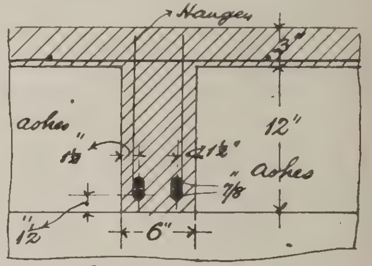
No. 1. Framing plan of basement.
No. 2. Framing plan of ground floor.
No. 3. Details of ground floor beams.
Nos. 4 and 4A. Details of the press-pit, beams, stooling-beams, floors, &c.
Zo. 5 Framing plan of first floor.
No. 6. Details of first floor beams, &c.
No. 7. Framing plan and sections of roof.
No. 8. Stairs, landings and 2½in. hanging walls, &c.
No. 9. Details of strong room on first floor for the Scottish American Trust.

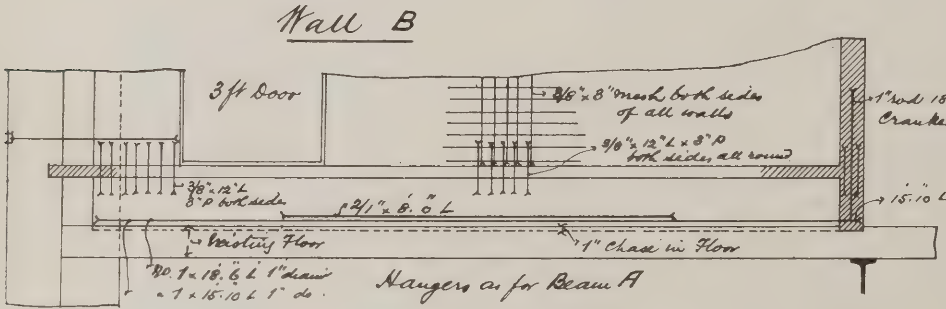
Working drawing No. 8 is a specially interesting piece of construction. It will


Floor
R.S.J
R.S.J
½"×12"L in holes in Concrete Floor
½" rods in web
½"×2.4 L through holes in Flange of R.S.J
½" rod × 12" L for hole in Floor on outside of Column.
Lashed
⅞"×4.8 bent round Column.
Inner
outer
⅞" rod × 24.3 long bent as shewn.
⅜"×3" Mesh both sides for all walls
⅞" rod from C turned up
Lashed
Lashed
1" rod × 18.6 L from B bent up as shewn
⅜"×12"L
"A"
1" Chase

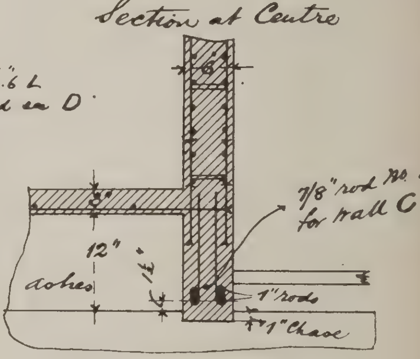
Elevation of Wall D.



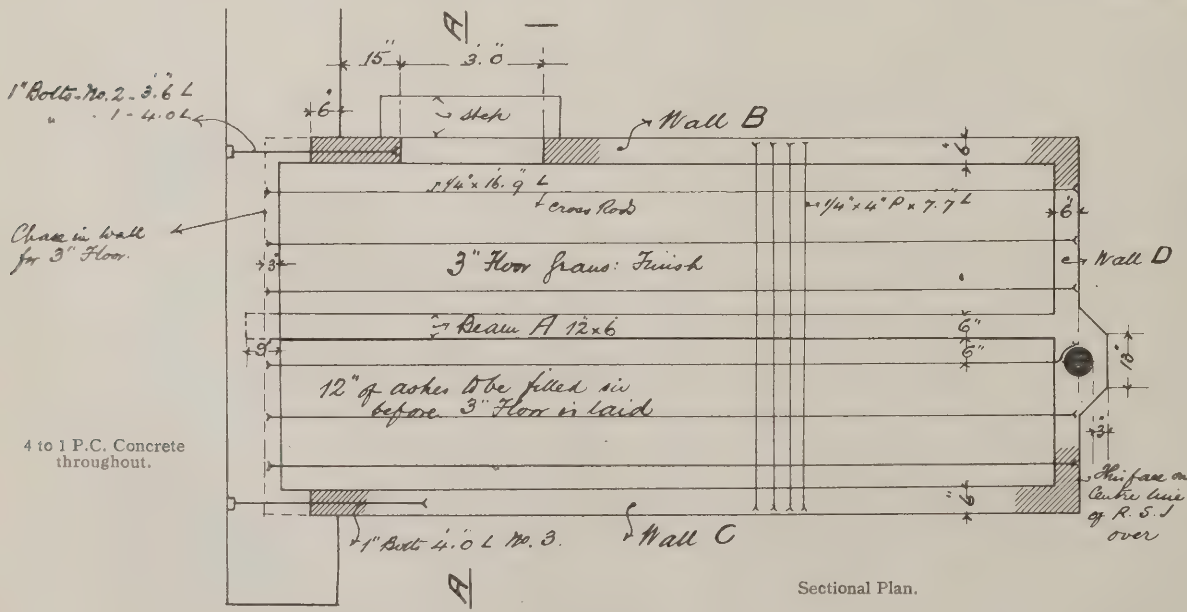




For Wall C No. 1—⅞in. rod at bottom 18ft. 6in. long end turned up, see Wall D. ⅞in. rod from D bent round same and lashed with wire.

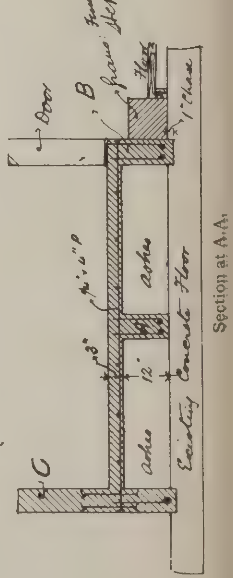


Section at Centre.

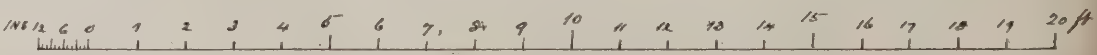


4 to 1 P.C. Concrete throughout.

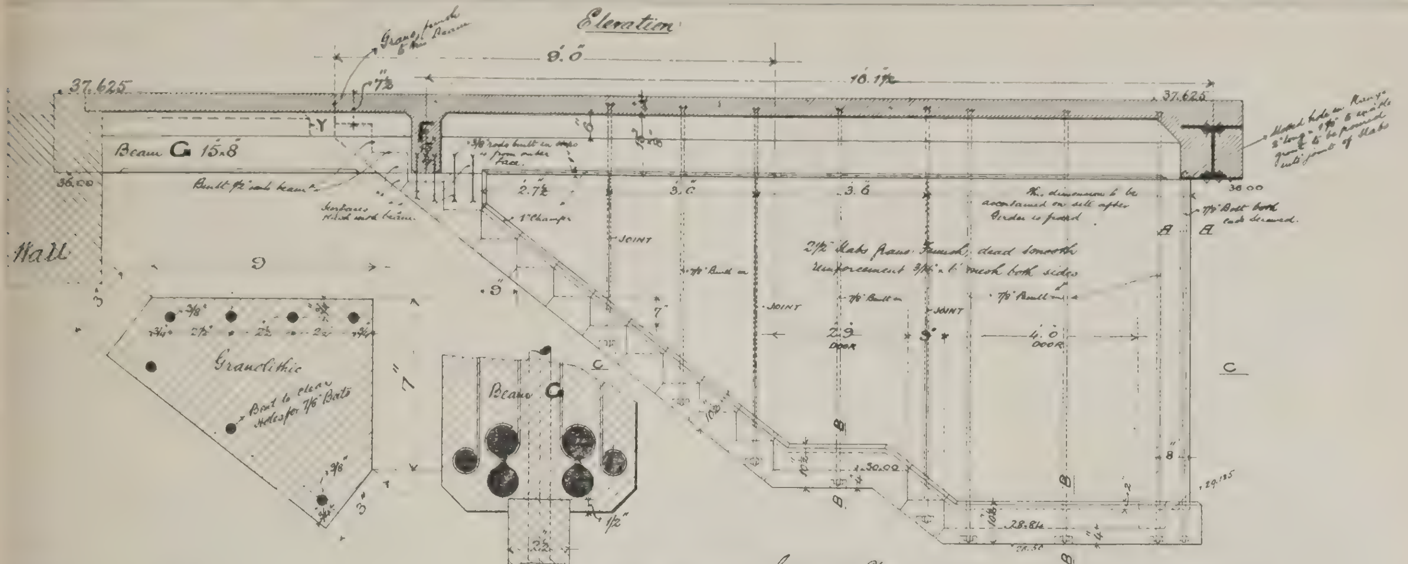
Sectional Plan.

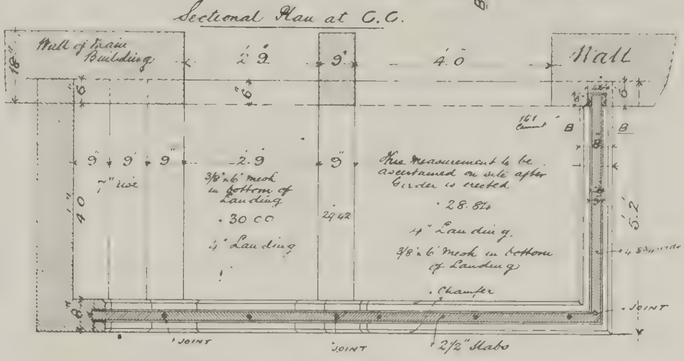


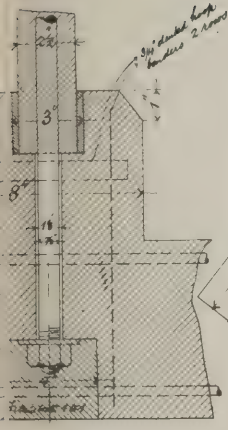
Section at A.A.


INS 12 6 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 ft

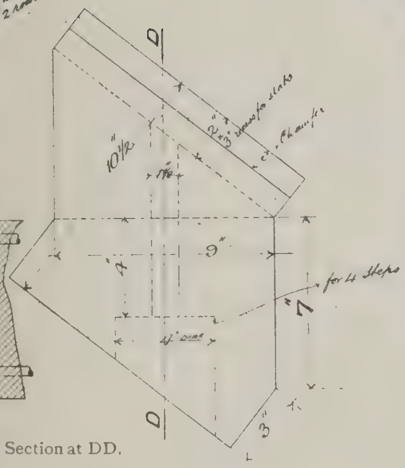
ANNEXE, "DUNDEE COURIER" BUILDING, DUNDEE. WORKING DRAWING No. 9, SHEWING DETAILS OF STRONG ROOM ON FIRST FLOOR. CONSTRUCTED IN REINFORCED CONCRETE, BY STUART'S GRANOLITHIC STONE CO., LTD. E. P. WELLS, ENGINEER. NIVEN & WIGGLESWORTH, ARCHITECTS.



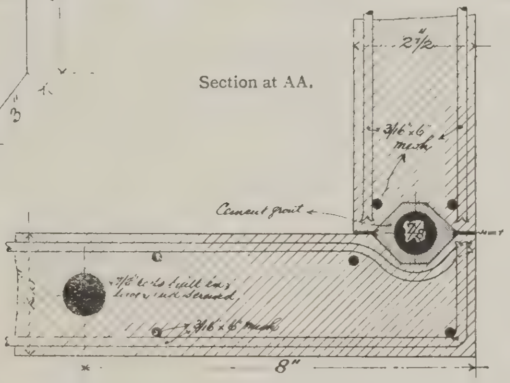




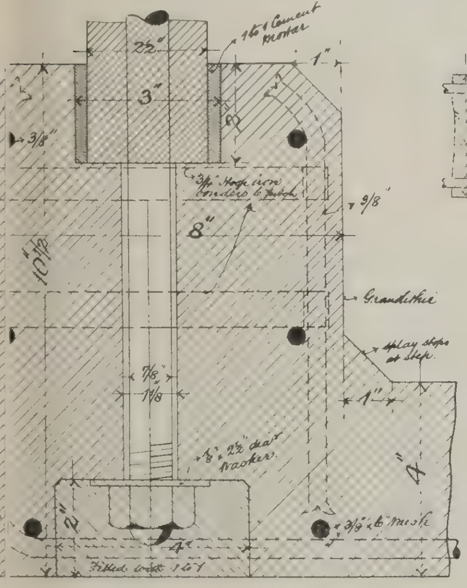
of Outer End of Step.



Section at DD.



Section at AA.



Detail at BB.

ANNEXE, "DUNDEE COURIER" BUILDING, DUNDEE. WORKING DRAWING No. 8, SHOWING STAIRS, LANDINGS AND 2½-in. HANGING WALLS.

be seen that the stairs are supported at one end upon the outside wall, but that the other end and the enclosing wall are hung up from the floor above.

Working drawing No. 7 shows the way in which Mansard roofs are constructed on Mr. Wells's patent system.

Working drawing No. 9 is another adaptation of reinforced concrete to which special attention deserves to be drawn. We referred in a small note on Page 36 in our "Fire" supplement for October 24th to the fact that the excellent fire-resisting qualities of reinforced concrete had brought about a comparatively new application of this material in the construction of fire-resisting and burglar-proof strong-rooms. This is a case in point. The detail referred to as "wall D" shows the manner in which connection was secured to the solid rolled steel columns which were used in the building in order to economise space.

We would refer readers for further particulars of the general construction to our other issues referred to above.

"MORNING POST" BUILDING.

We give herewith two further illustrations of the construction of this building, of which a number of photographic views and some working drawings of the steel work have been published in former issues of this supplement. The first of the present views shows the method of supporting the centering for the double floor construction on the Columbian system of reinforced concrete, while the second view shows the boards to retain the concrete and the peculiar +-shaped Columbian bars which support the ceiling in position. So far as we recollect, this double floor construction has never been illustrated in this way before. The usual Columbian floor is a solid one and has bars shaped thus ‡ Such bars, indeed, are used for the upper construction of these particular floors of the "Morning Post" building. After the ceilings have been built, clinker ashes, similar to those forming the concrete aggregate, are placed upon the ceilings in a layer several inches thick, so as to form a centering for the upper construction. Holes are left in the latter, so that when the concrete has set the ashes can be dug out, leaving the floor hollow.

The site of this building has nearly the shape of a narrow triangle, with the longest side (to Aldwych) slightly curved. Further, all the corners are rounded. The first appearance of the steelwork, seen from the corner of Lancaster Place and the Strand, reminds one of the "flatiron building" in New York, but the building has only five floors above the ground floor with one mezzanine and roof, and is not to be a skyscraper.

The framework at the Strand corner is of greatest interest. The exterior walls and the floors are carried on curved plate-girders cantilevered out from the columns—a construction difficult to design and to erect, but one affording great stability and leaving the ceilings in the most important rooms at the corner uninterrupted by girders projecting below. At the fourth-floor level there is an extra heavy curved girder, resting on top of the stanchions and carrying the dome; this girder was illustrated in our issue for October 10th. The dome is framed up of I beams bent in the vertical plane and tied together at intervals.

Altogether about 950 tons of steelwork was needed for the building, half of this being below ground-floor level. The depth of foundations is about 39ft. below street-level. A concrete retaining wall is constructed all around the building, having a thickness at base of about 10ft. The basements are constructed like a tank, with an asphalt course all round to keep out water.

In one part of the building there are three floors below the ground level, and in the centre there is a large room 22ft. high, intended for the three great newspaper presses. Three of the inside stanchions are omitted below ground floor, and heavy plate-girders are placed to carry them.

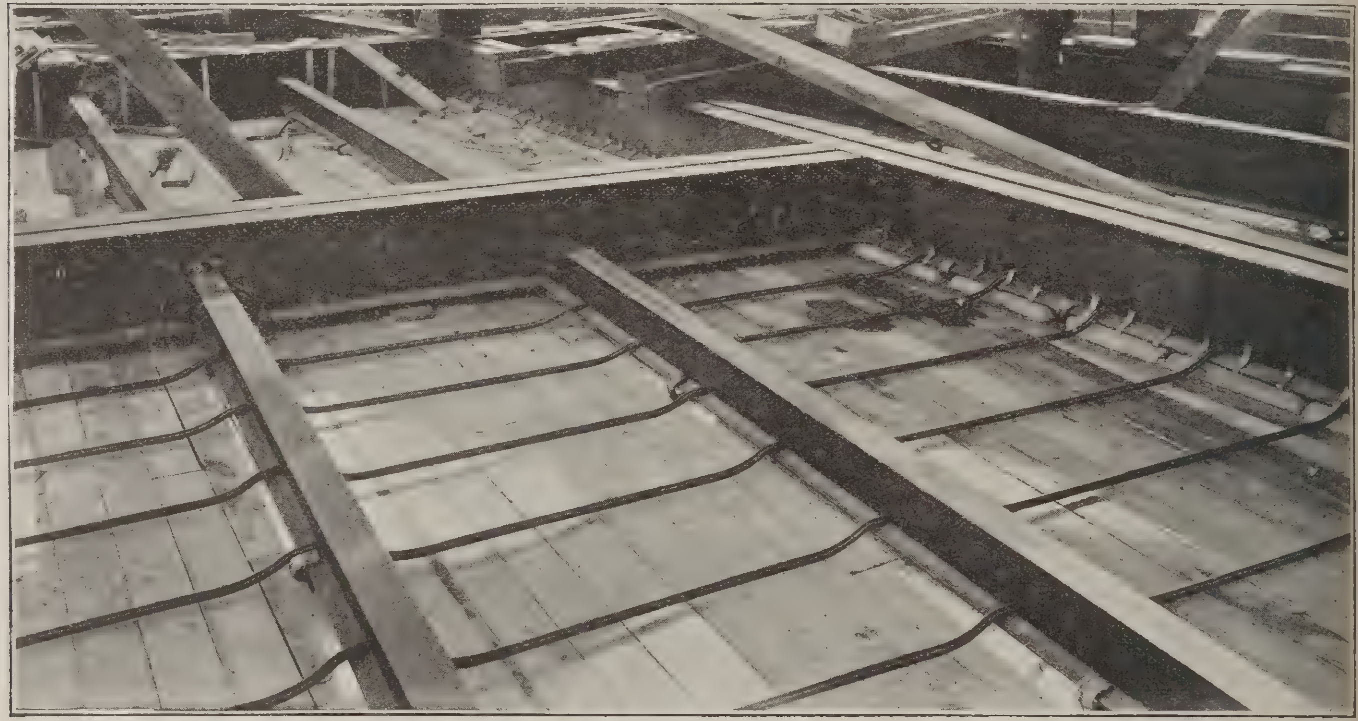
The exterior walls are of Norwegian granite with brick backing the whole height. The total thicknesses of the walls are in accordance with London Building Act, although they do not carry any loads.

The foundation work is somewhat interesting. Owing to the heavy loads upon the stanchions the foundations have considerable spread, and the concrete foundation beds for the printing presses, situated in the basement, overlap them. If these were made continuous the vibration from these presses would have been transmitted through the steel skeleton to a most distressing extent. The foundations for the printing presses have, therefore, been built down to earth in the spaces between the spreading stanchion foundations and the portions overlapping cantilevered from the separate foundations, with a 6in. layer of sand interposed between, so as to deaden vibration.

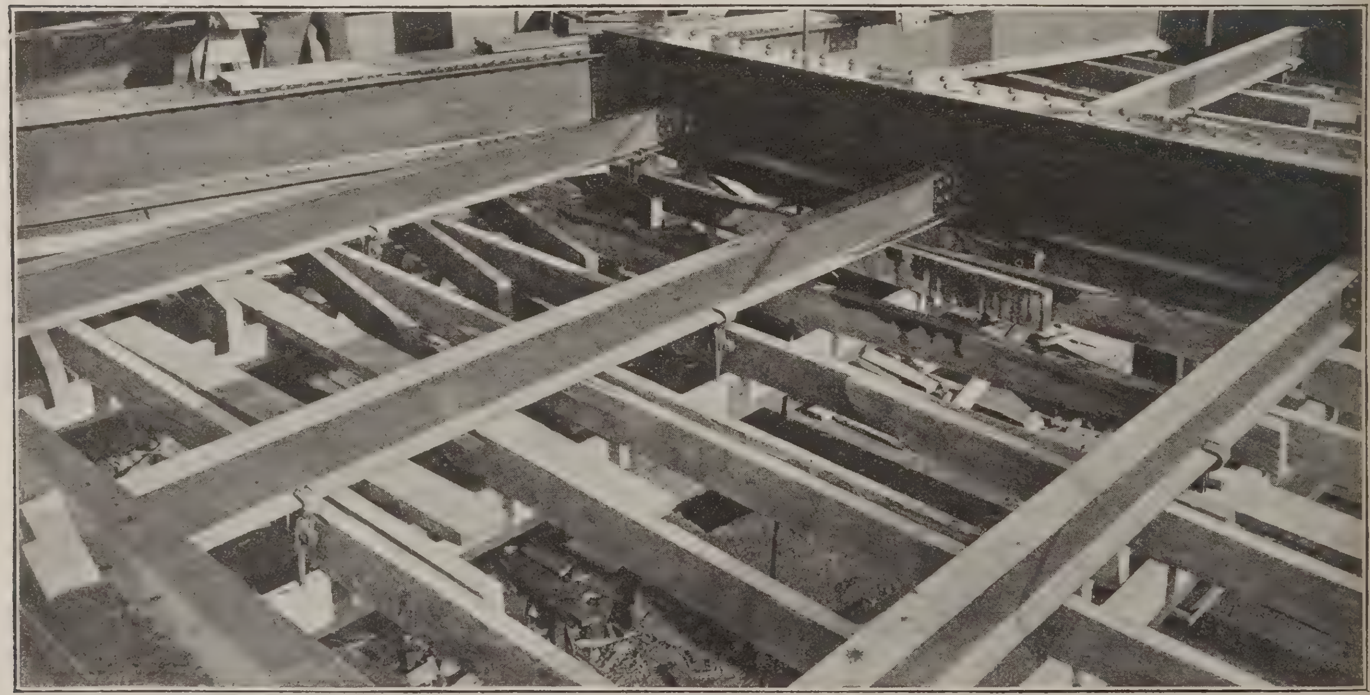
An artesian well has been drilled on the site, which will supply the whole requirement in the building. On the roof four water-tanks, together containing 24,000 gallons, are provided. Heavy steelwork at the roof-level was therefore necessary.

The erection of the steelwork has been very rapid, but, nevertheless, very careful. The last cast-iron base in the foundation was set on June 30th, and the fifth floor was erected on September 14th, the roof-framing being completed (including dome) on September 21st. As there are ten floors (including roof and two mezzanines) about one floor was erected per week.

The steelwork has been painted one coat after erection, and is to be enclosed with 2ins. of concrete throughout, for protection against fire.



View showing centering completed, and ceiling reinforcing rods in position.



View showing centering partly erected.

CONSTRUCTION OF COLUMBIAN DOUBLE CONCRETE FLOORS AT THE "MORNING POST" BUILDING, ALDWYCH, LONDON.

The steel (which is German) was all fabricated in advance, and we would draw attention to the fact that shop drawings and the work generally were carried out with such accuracy that, in spite of the curved front and the rounded corners of the building, the steel fitted perfectly when it was put in place. It may be considered a record of correctness and good work.

The architects of this new building are Messrs. Mewès and Davis, of 6, Dean Street, W., the contractors being The Waring White Building Co., of 1a, Cockspur Street, S.W. The steelwork has been designed and erected by the contractors, Mr. S. Bylander and Mr. Nicholson (both of the Waring White Building Co.) being responsible for the design and erection respectively.

REINFORCED CONCRETE SYSTEMS.

VII.—Johnson's Wire Lattice.

Johnson's wire lattice system of reinforced concrete construction has only recently come into being, but it belongs to a type of construction which has been used in America for many years; in fact, it was first introduced in its present form in response to suggestions of American engineers engaged in the construction of the Savoy Hotel extension, about two and a half years ago. These engineers had been accustomed to using continuous wire lattice in the United States, and, desiring to adopt the same system of construction in this country, they looked round for a manufacturer able to make a quantity. They found that Messrs. Richard Johnson, Clapham & Morris, of Manchester, not only possessed the means of undertaking its manufacture, but were already experienced in such work, for they had made a quantity of wire lattice for reinforcing a concrete cover to conveyor subway alongside No. 9 Dock, Manchester Ship Canal. The Savoy Hotel extension was, however, the first large job where their wire lattice was used. About 30,000 sq. yds. of floors were laid there.

Longitudinal Reinforcement Insufficient.

Some system of crossing wires is necessary in order to adequately reinforce concrete floor construction. If only longitudinal reinforcement is used, cracks will occur, due to one portion of the floor being loaded heavier than another portion. It is for this reason that Coignet, Monier, Hennebique, and other pioneers in reinforced concrete construction early adopted a lattice reinforcement. Generally the sizes of the rods in floor reinforcement are determined by calculating the floor as a beam running longitudinally, the crossing rods being small and simply used to obviate the tendency to develop longitudinal cracks, due to irregular loading. The points where rods cross each other are wired, so as to keep them in place. The Johnson lattice is somewhat similar in form, because the longitudinal wires are generally of larger section than the crossing wires, but the latter are made of stouter proportions, it being recognised that ordinary floor slabs in buildings are approximately square and receive support from all four sides.

The advantages of Johnson's wire lattice are that it is conveniently handled, does not bear rough edges to tear the hands, that the lattice wires are kept correctly in place and that the lattice is made in continuous lengths, thus giving a continuous bond and creating a monolithic construction.

How the Lattice is made.

The lattice is made of drawn steel wire from 13 to 6 gauge, and can be laid in lengths up to 300ft., so that in a building of ordinary size the reinforcement can be secured at the front or rear and carried through the entire length without a break. Heavier gauged wire can, if desired, be used, but the lengths of lattice are then about 50ft. long and sheets are connected to each other by hooks if the length of the building requires more than one sheet. The lattice is usually made, however, in rolls 6ft. wide by 120ft. long. Rolls can be made of any convenient width other than 6ft. Usually the lattice has a square mesh, but it may have an oblong mesh if desired. It can be made with a greater strength in either the long way or the short way of the sheet or roll, and may also be given extra strength in certain parts, as will be described later.

High Elastic Limit Steel.

The fact that this lattice is made from drawn steel wire, of course, means that the metal has a high elastic limit and, consequently, gives a greater factor of safety than common low elastic limit steel. The factor of safety in construction depends, of course, upon the elastic limit, because when the stress goes beyond this point the strain increases disproportionately to the stress, and the modulus of elasticity drops to about 5,000,000. Consequently, when the elastic limit is reached the strain will be permanent and the material will eventually fail without ever reaching its ultimate strength. The common factor of safety of 4, which is taken upon the ultimate strength, means, with ordinary commercial soft steel, really only a factor of safety of 2. Although with high elastic limit steel the ultimate strength may not be increased, yet it gives a much higher factor of safety, because the elastic limit is higher. This is given to the reinforcement in the Johnson wire lattice system in the best way, not by the dangerous practice of adding carbon to the steel, which renders it shorter in grain and liable to fracture, but by manipulating ordinary steel in the process of manufacture—*i.e.*, by drawing the wire through a die. The wire used has an average elastic limit of 65,000 lbs. per sq. in. The ultimate strength is quite 85,000lbs.

The reinforcement in Johnson's wire lattice is of small section. Consequently there is no danger of want of adhesion between the concrete and the reinforcement such as occurs with large sections, and the wire does not pull through when tested to destruction.

Tests.

Various tests have been carried out upon slabs reinforced with the lattice. We may mention one carried out at Johnson's works at the time of the Savoy Hotel extension. A slab 4ins. thick and of 6ft. clear span, made of cement, brick dust and broken brick in proportion of 4 parts aggregate and 1 of cement, was loaded to 585lbs. per ft. super., at which point the deflection was found to be 4½ins., although the deflection had only been 5-16in. at 393⅓lbs. The load was increased, but unfortunately fell over before the breaking-point of the slab was reached. The reinforcement was 1½-in. mesh by 11G. lattice.

Standard Sizes.

The following is a table of sizes and weights of Johnson's wire lattice of standard manufacture, but any required variation can be made in a quantity :—

No.	Mesh (ins.)	Wires.	Approximate wt. per sq. yd. (lbs)
1	1½ square	No. 13×13's gauge	3.4
2	1½ do.	No. 11×11's do.	5.0
3	1½ do.	No. 10×10's do.	6.6
4	2 do.	No. 6×11's do.	8.5
5	1½ do.	No. 6×11's do.	11.25
6	2 do.	No. 3×11's do.	13.5
7	1½ × 3	No. 13×13's do.	2.6
8	1½ × 3	No. 11×11's do.	4.0
9	1½ × 3	No. 10×10's do.	4.9
10	2 × 4	No. 6×11's do.	6.4
11	1½ × 3	No. 6×11's do.	8.6
12	2 × 4	No. 3×11's do.	10.1
13	1½×2½(twin wires)	No. 10×11's do.	9.8
14	1 × 2½ do.	No. 10×11's do.	12.7
15	⅝ × 2½ do.	No. 10×11's do.	18.9

Calculations.

As regards calculations for members for reinforced concrete construction, Messrs. Richard Johnson, Clapham & Morris have no special theory of their own. They have adopted a modification of the general modern theory for the design of reinforced concrete associated with the names of Considère, Ritter, Christophe, Hatt, Talbot, and Turneaure. The differences between these various authorities very little affects the practical designing of reinforced concrete works.

We will now describe various forms for reinforced concrete construction, which have been worked out to use Johnson's wire lattice to the best advantage.

Floor Systems.

Fig. 1 shows the way in which the reinforcement is placed in floors of small span. This construction is economical up to 6ft. span. The steel lattice, it will be seen, is protected from corrosion and fire by the concrete, as it should be. Occasionally the thickness of the floor has been reduced to the exact depth of the joist. The lattice over the joists and in the centre of the slabs is then exposed and liable to corrosion, but, of course, some form of cement flooring and plastering might be used to protect the metal.

Fig. 2 shows the construction adopted for floor spans of 8ft. to 16ft. The steel joists are here shown exposed on the soffit, but they can be protected in the usual manner and a suspended ceiling can be adopted if a panelled ceiling is not desired.

A further system of flooring is shown in Fig. 3, where steel joists are used as the main beams. This suits large spans, from 12ft. to 25ft., and reduces the quantity of concrete needed with a flat floor of such a span.

Corridors and Wall-End Bays.

Figs. 4 and 5 show methods for the support of concrete floors along corridors or wall-end bays. Fig. 4 is a method adopted in the construction of new buildings; the portion of floor shown resting upon the wall may be built in, or it may be supported by corbelling out. When, however, the walls are already built and it is not advisable to cut them away, the method shown in Fig. 5 has been found serviceable. A channel is placed as shown against the wall, bolted through to a plate on the other side. The lattice is not fastened to this channel, which only serves to support the concrete.

It is unnecessary for us to show the manner in which roofs are reinforced with Johnson's lattice, as the construction is very similar to that adopted for floors.

Pillars.

The wire lattice system has recently been adapted to other forms of construction besides floors. Considère's experiments have shown that the ideal reinforcement for columns or pillars consists of spirally-wound rods, but the difficulty of keeping the spirals in place has prevented this being generally adopted in practice. (Fig. 6.) Messrs. Richard Johnson, Clapham & Morris have, however, arrived at a method of overcoming the difficulty by weaving rods vertically up the spirals, so as to keep these latter firmly in place while the concrete is being tamped inside the column. These reinforcements can, of course, be made for square pillars with equal facility.

Beams.

As regards the reinforcement for beams, it is now common knowledge that, with distributed loads, beams are liable to fail by shear; so that they require a vertical reinforcement such as stirrups, wires or hangers. The method by which the reinforcement against shear is given in Johnson's lattice system is shown in Fig. 7. Heavier rods are arranged to be placed at the bottom of a beam and passed through the lattice, as shown, before being placed in the mould. Rods are used, as wires of sufficient strength would be too stiff to be woven into the lattice.

Sewers, pipes, water conduits, &c., can also be reinforced with Johnson's ordinary lattice and need no explanation.

A work in course of Construction.

Among the more important works at present in course of construction where this lattice is used we may mention Ryde Pier Deck. This work comprises the removal of an existing sleeper road, ballasted track and timber decking, and the construction of a new deck in reinforced concrete upon the existing steel superstructure. The latter consists of compound longitudinal girders and rolled steel joist fillers, these being spaced at about 5ft. centres. The deck is designed to carry a safe load of 15 tons per lineal yard of track. The reinforcement consists of sheets of Johnson's No. 11, 1½in. by 3ins. mesh No. 6 by 11G. lattice in lengths of 101ft., the reinforcement thus being continuous over 20 supports. The ratio of reinforcement to concrete in sectional area is as 1 : 288, which is roughly .33 per cent.

The following are some of the jobs in which the lattice has recently been employed :—

Savoy Hotel Extension.

Manchester Ship Canal Co. : conveyor tunnels, floors, girders and walls.

Manchester Corporation Water Works : bridge work and arched flooring.

H.M. Office of Works : bridge decking Regent's Park.

Mr. W. T. Couldrey, London : warehouse floors.

Joseph Baker & Sons, Ltd. : foundations.

L. & S. W. & L. B. & S. C. Rys. Joint Comm. : railway pierdeck work, Ryde, I.W.

Wolseley Tool & Motor Car Co., Ltd. ; garage divisions.

Mackey-Seymour Engineering & Coke Oven Co., Ltd. : floors.

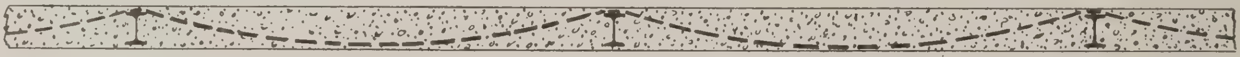


Fig. 1.—Floor Construction for Spans up to 6 ft.

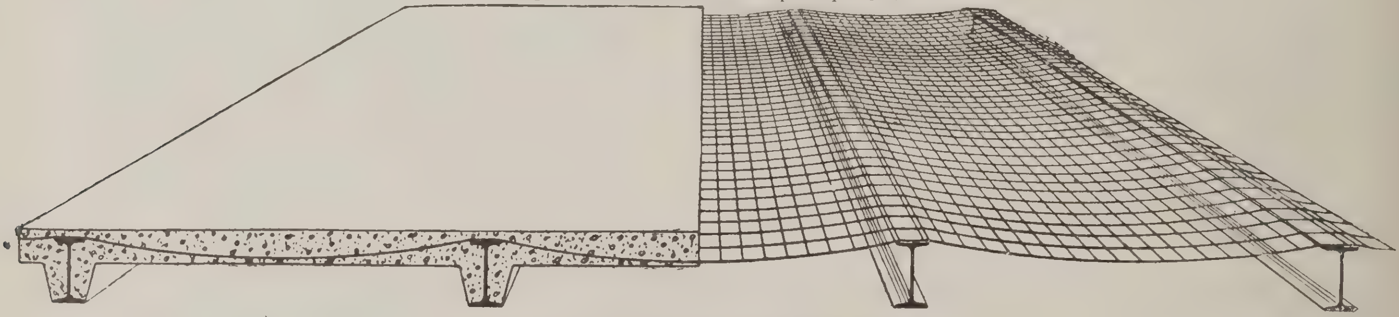


Fig. 2.—Floor Construction for Spans from 8 ft. to 16 ft.

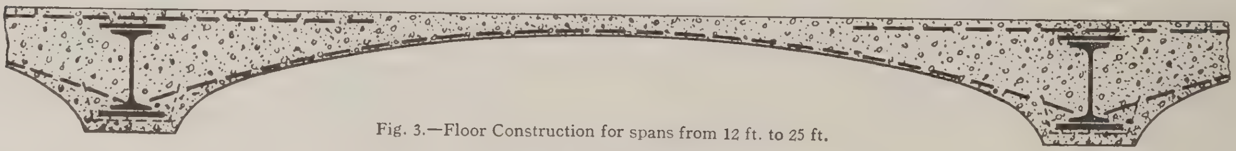


Fig. 3.—Floor Construction for spans from 12 ft. to 25 ft.

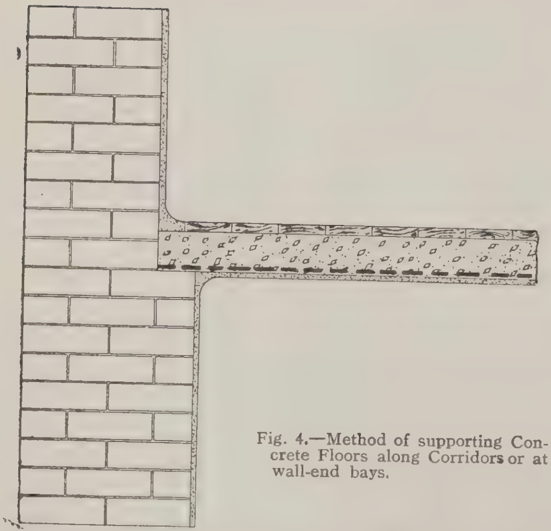


Fig. 4.—Method of supporting Concrete Floors along Corridors or at wall-end bays.

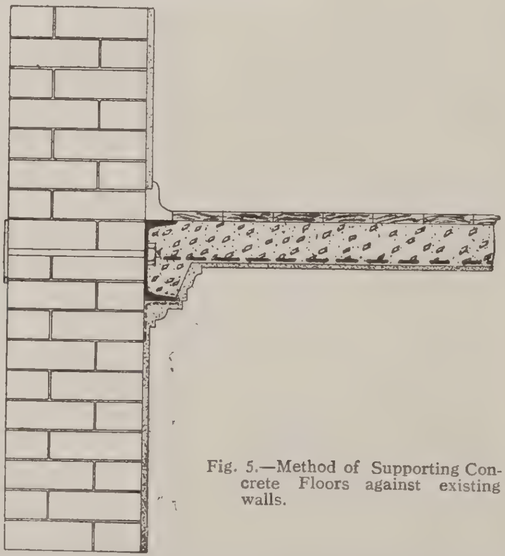


Fig. 5.—Method of Supporting Concrete Floors against existing walls.

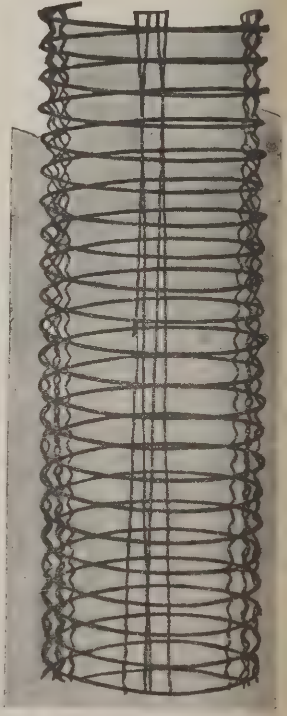


Fig. 6.—Reinforcement for Pillars.

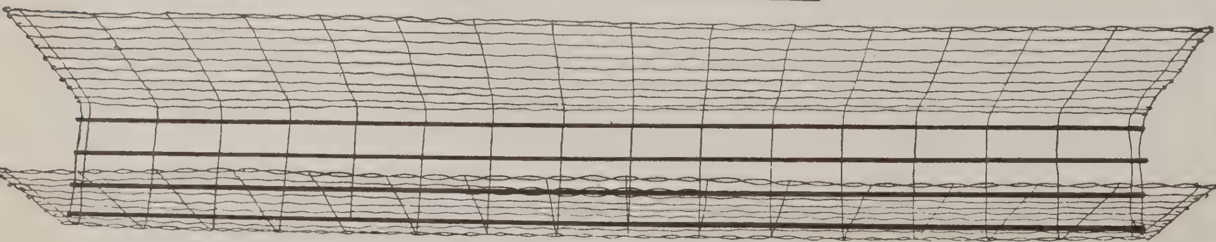


Fig. 7,– Beam Reinforcement,

SOME APPLICATIONS OF JOHNSON'S WIRE LATTICE SYSTEM OF REINFORCED CONCRETE CONSTRUCTION.

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In our issue for November 28th we shall publish a special article on

NEW BUILDINGS IN GLASGOW,

which will be illustrated by a large number of photographs and drawings.

An Engineer's Address. CALLING to mind the sufferings of the past, we are apt to count presidential addresses as necessarily dreary affairs. Within the past week, however, we have had two great exceptions in the inaugural addresses delivered by Mr. Collcutt before the Royal Institute of British Architects, and by Sir Alexander Kennedy before the Institution of Civil Engineers. Mr. Collcutt's address was given in our issue for last week, and readers who took the trouble to peruse it will have noticed that the new president of the Institute quite departed from the time-honoured, wearisome recital of the events of the past year, with desultory comments thereon, giving instead some spirited criticism on a few outstanding matters that have attracted attention recently. Sir Alexander Kennedy's address was also critical, wide in its treatment, and altogether one of the best addresses of its kind we have heard for a long time. At the architectural societies we are accustomed to diatribes against the engineer who essays a feeble sort of architecture, and we are also accustomed to the assumption, by consequence, that things might be beautiful if only architects had a hand in the matter. It is refreshing, therefore, to hear a brilliant engineer making some pertinent retorts about architects. Sir Alexander, however, recognised that architects had some right on their side, and he hoped that in future engineers might not be so great sinners as they had been in the past. "We expect architects," he said, "to consult and employ engineers to help them over structural difficulties, and we may even scoff when they come to grief for not doing so. They are, on the other hand, quite entitled to turn the tables on us when they see that an engineer has put up a hideous barn which they could have transformed into a pleasing structure by their own special knowledge, and by that sense of form which it has been their chief business to cultivate, while we have been working at bending moments and breaking loads." This is a matter likely to come into greater prominence in the future, in view of the vast changes brought about by steel-frame buildings, demanding the engineering problems to be solved first, and the architectural clothing added later. Sir Alexander Kennedy raised the question, To what extent do engineer and artist come in contact? When engineering structures were confined to masonry bridges and pumping-stations the matter was comparatively simple, it being difficult to make a stone bridge which was structurally efficient and actually hideous at the same time, but it might very well be doubted whether the castellated or quasi-Gothic building was the most suitable form for a Cornish engine-house. Nowadays engineers have little chance of building stone bridges, but Sir Alexander challenged comparison between the great masonry dams of such undertakings as the Birmingham waterworks and any architectural structures. The president of the Institution of Civil Engineers did not feel himself competent to discuss the true inwardness of our consciousness that a Parthenon in cast iron, or Gothic tracery in steel bars and angles, however closely each might imitate its original, would not be beautiful; but whatever the reason might be, he said, the consciousness was probably there with all of us. "Possibly if cast iron had been known in Athens 3,000 years ago our ideas would have been different. But as it was not, we must take things as they are, and recognise that our feelings of to-day, reasonable or unreasonable, are what really constitute the facts of the case." Bearing that in mind, however, it was a little amusing to hear Sir Alexander's references to what was done in the way of architectural trimmings to purely mechanical contrivances. Even in the time of his own apprenticeship it was universal for bed-plates, entablatures and other large castings to be finished at their corners and angles with mouldings, more or less carefully designed according to classical models, while moving parts, such as the bosses of cranks, were ogeed round their edges, and no connecting rod of a stationary engine was considered finished without a double ogee ring round the middle of its length! Matters have improved nowadays, for, long since, we have come to the conclusion that a mere copying of a classical outline in a wrong material is not artistic and is not beautiful.

The Army and the Building Trade. THERE is no end to the reforms suggested in connection with the Army, and we should hesitate to propose another, were it not that we feel that our proposal were a novel and a far-reaching one. It implies a fundamental change of outlook. It has been often stated that two of the chief reasons why the Army is unattractive are that the pay and the prospect of a soldier securing profitable employment in civil life after he has left the service are both alike small. We can hardly afford more pay, for the soldiers' services in time of peace are unremunerative to the nation. In regard to the second point, a discharged soldier is an unskilled worker. We propose to meet both these points. We would have the soldier taught a trade, and call upon him to use it during the term of his service. The nation in return for this remunerative work would be able to grant extra pay. The building and engineering trades offer particularly favourable opportunities in this respect. Do we not know that many of the buildings, aqueducts, harbours and bridges of Rome were built by the Imperial soldiery when in winter quarters or on garrison duties? Does not the German army to-day often build its own barrack structures, sheds, &c.? Why should not the British Army build its own barrack structures, sheds, fortifications, and undertake the many other Government works given out to contract? They are now designed by its own staff, and could be executed by its own men.

GUTTERS.

So much of the effect of every building depends upon its treatment at the eaves, that it is to be wondered why this important detail is usually dealt with, in the average text-book, in such a slipshod and often unpractical way. Being the lowest point of the roof, provision must be made for the removal of rainwater, and being also the point of juncture between covering and enclosing surfaces, some strongly-marked emphasis seems æsthetically necessary.

The dripping eaves represent, no doubt, the earliest device in point of date, as well as the simplest and most direct solution even now for isolated buildings of no great height standing within their own ground. The necessary complement of the dripping-eaves is some special treatment at the ground level as a protection against the falling water and to avoid splash at the base of the walls. Perfect protection in this way is afforded by the narrow paving of "petrified kidney" pebbles and the tarred plinth which usually surrounds the Essex thatched cottage. To provide a reasonable gutter to a thatched roof is a practical impossibility, and for this material, at any rate, the dripping-eaves is the natural finish. The drip from thatch is also less persistent and concentrated than from any other form of covering, owing to its indefinite edge. A considerable amount of projection (in direct proportion to the height of the walls) must be always provided where water is allowed to drip from roofs; otherwise it may be blown against the building in its passage, and this is the reason why moderate height has been counted a necessity in this treatment, as the projection necessary in a high building would become excessive and wasteful. An interesting and suggestive partial use of the dripping eaves by Mr. Lutyens may be seen at the new offices of "Country Life," where a pantile roof of steep pitch, placed upon a solid attic storey, drips into a lead gutter formed in the stone cornice some feet below. New Scotland Yard has a similar device.

The storage of rainwater is not so conveniently arranged with dripping eaves as by the use of gutters and downpipes. One of the simplest forms of gutter (Fig. 1) is that constructed of wood to a **V**-section and supported by wooden gallows brackets. This is capable of being very effectively treated, as in a well-known example at Rye which has been often sketched and photographed. Wooden gutters, if well tarred inside, remain quite watertight, besides being cheaper and more durable than the cheapest zinc and iron gutters. It is interesting to note that in American provincial practice they form the rule rather than the exception. The supporting brackets may be appropriately ornamented by that fanciful type of chamfering seen on old farm-wagons.

Zinc gutters are cheap and tractable. For these reasons they are largely used by the speculating builder. They require staying internally at frequent intervals to prevent sagging owing to the flexible nature of the metal. Although they are light, there is, however, no need for them to be made so flimsy as they generally are: they are never free from the disadvantage that should a ladder be leaned against the gutter it is bent out of shape. Cast iron probably makes the most generally satisfactory cheap gutter, and the half-round is its most pleasing form. This may be supported in various ways—by wrought-iron brackets screwed to the rafter feet (Fig. 2); by wrought or malleable brackets screwed to a wood fascia (Fig. 3); or by wrought iron driving brackets direct into the walls (*see* THE BUILDERS' JOURNAL for May 16th last). Any one of these is good on occasion, but there are points to be considered whichever be adopted. In old work it is quite usual to see the gutter fixed so low that the line of the roof-surface produced would clear it entirely. This is of advantage in two ways—namely, in the event of a torrential downpour the gutters are likely to be insufficient to carry off the water, which accordingly would overflow and drip or splash against the walls; but when fixed low in the manner described, the water in such case shoots altogether clear of both gutter and walls. Similarly, snow is able to slide off the roof without striking the gutter. A disadvantage of this low position occurring when the gutter is fixed to the rafter feet is the liability for water to be blown by a gusty wind out from the back of the gutter against the walls. This is almost obviated if the gutter, instead of being true half-round, is of **J**-section, which also allows it to be screwed as additional fixing. The defect is also remedied by the use of a fascia board. Though, however, an open eaves with cut sprockets or rafter feet is capable of pleasing treatment, the addition of a fascia board at once ruins the effect, making it poor and mean, and if such a provision is deemed desirable a close eaves or box cornice (Fig. 4) should be formed, by the addition of a soffit and bed-mould either in wood or plaster. In this connection it may be said that although the attempt is often made to persuade a cast-iron ogee gutter to masquerade as the cymatium of such a cornice, it is rarely a success. It is far preferable either to frankly recognise the gutter (as before described) or to form a lead gutter behind a wooden cornice.

The third method of supporting a half-round type of gutter—by iron driving brackets—is a very good one and allows all the eaves to be covered. The driving brackets (Fig. 5) can be made by any

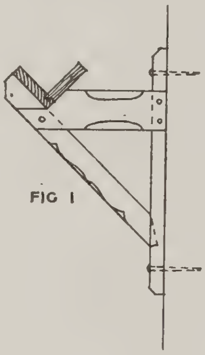


FIG 1

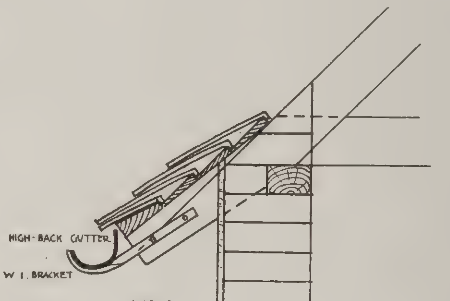


FIG 2

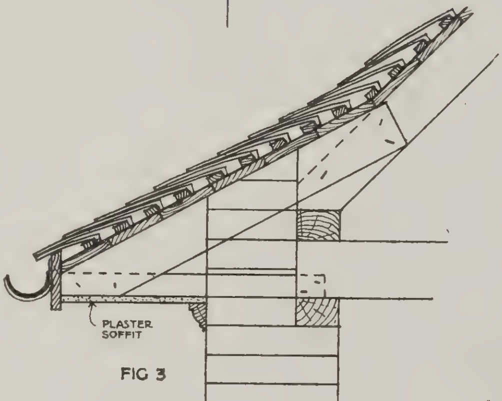


FIG 3

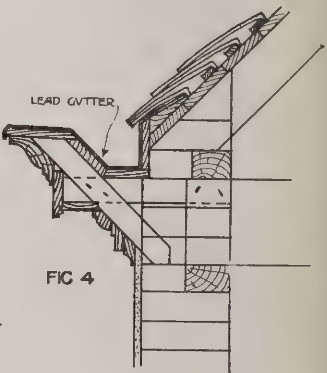


FIG 4

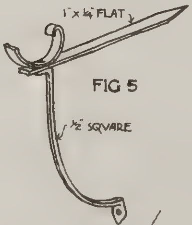


FIG 5

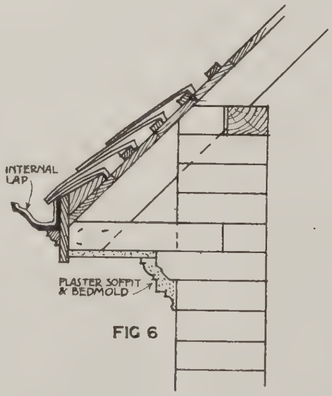


FIG 6

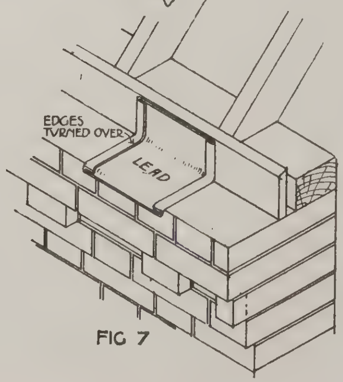


FIG 7

ordinary smith at very small cost, but a few points need to be remembered in their design. The fixings should be kept an exact dimension of the brick or masonry courses, and a small extra length should be provided at the back-end of the actual gutter-clip, which is bent over to prevent the gutter slipping out of place when a ladder is reared against it. Should an ogee or moulded gutter be fixed to a wood fascia (Fig. 6), it should not depend entirely upon screws, but in addition should bear upon a small moulding, as the heads of the screws are liable to rust off. The socket joints should have an internal lap.

It is sometimes thought necessary to abandon eaves projection and allow the gutter to rest upon the wall with or without corbel courses. This is a usual though not very desirable position, but a few simple precautions will diminish the risk of leakages soaking down unobserved into the brickwork. In the first place the back edge of a wall gutter should be ever so slightly higher than the front. In the event of overflowing, water then escapes visibly. The joints also need attention, as they are apt to leak owing to expansion and contraction after some little exposure to changes of temperature. This liability has been sometimes expensively recognised by architects in placing a lead covering on the wall seating below the whole length of the gutter, but a small saddle piece (Fig. 7) below each joint will do all that is needful.

Wall gutters are frequently made extravagantly large owing to the difficulty of securing rapid removal of water by an adequate fall towards the outlet. Should expense allow, a cast-lead gutter is a superior alternative and capable of charming treatment by pattern in relief, tinning, or gilding. Falls may be obtained within the depth of such a gutter and the risk of leakage is practically absent.

Where a roof is much broken by dormers or chimneys, necessitating numerous short lengths of gutter, all may discharge into a continuous trough carried on corbels at the nearest convenient point below. One downpipe and gulley may thus be substituted for a number. A similar result can be achieved where eaves project well, by carrying the half-round or **V**-gutter across any gaps, upon brackets.

King's Lynn Grammar School.—The King and Queen opened last week the new buildings of the King Edward VII. Grammar School at King's Lynn, which have been erected from designs by Mr. Basil Champneys, at a cost of nearly £40,000. The buildings form three blocks (connected by a corridor), the central one consisting of the main school hall, with classrooms attached, while to the north is the science and art wing, and to the south the boarding-house and master's residence.

University College Hospital, Gower Street, having now been completed, was formerly opened last week by the Duke of Connaught. The plan is that of a central block comprising staircase and lifts, operating theatre, &c., with four cross-shaped projecting ward blocks. The wards are 86ft. long by 25ft. wide and 12ft. 6ins. high, accommodating 24 beds each. In all there are about 300 beds. The building was designed by the late Mr. Alfred Waterhouse, and has been carried to completion by his son, Mr. Paul Waterhouse.

SOME VIEWS OF PROF. LETHABY.

We extract the following from an interview with Prof. W. R. Lethaby, published in the "Tribune" last week :—

"From all I hear the Americans are generations in front of us in methods of planning cities. Washington, for instance, is not a jumble of streets and houses, but a magnificent unit. Still more, the French and the Germans have a sense of order. They think in cities, not in details and fragments. Berlin, although rather too formal and almost oppressive in its severe adherence to geometry, is nevertheless an impressive lesson in architectural planning on a great scale.

Aesthetic Gasometers.

"One does not like to decry one's own city. Still, one must confess that London, in spite of fine 'bits,' is still an ugly city. It is almost depressing to come back to London from abroad. Of course, many people who profess the artistic temperament pretend to see a beauty in its squalor. You yourself say how fine the vista of the Strand looks from the top of an omnibus, with all its colour when the lamps are lit. There may be beauty in it, but it is mere decadence all the same. It reminds me of a story about a lady and William Morris. 'Oh, Mr. Morris,' she said, 'I saw a gasometer in the fog last night, and it seemed like a golden crown of glory!' Mr. Morris looked at her.

"The Strand! Good heavens, what is it? The high street of early Johannesburg, or some shanty village in the West, would not be more of a hotch-potch of mean houses and big buildings—a highway of disorder. And yet it is the chief thoroughfare of the city from West to East.

"What we want above all in London, as Mr. Norman Shaw has pointed out, is a general plan to grow upon, however slow that growth may be.

Neglected Genius.

"It is a little disheartening to remember how we have wasted our best abilities in relation to the public service. Thus Pugin, our greatest genius in the nineteenth century, only had an opportunity as a ghost to Sir Charles Barry: Cockerell, the most scholarly designer of the century, had no public work at all: and Alfred Stevens, a man who could have done anything in the combination of sculpture with architecture, was worried to death over one tomb—the tomb of Wellington in St. Paul's. Burne-Jones, Morris, Watts, have left us nothing. They would have given freely, but they were not asked. Watts's most noble statue of Physical Energy, of which there was some rumour, two or three years ago, that a copy might be obtained for London, seems to have been entirely forgotten.

"The authorities in some other countries look upon architecture and the beautifying of their cities as a high manifestation of patriotism. There is but little of that spirit in this country.

Whitewashing the Tower.

"A visit to the Tower is a dreary experience, which takes the romance out of what might become the most impressive building in the kingdom. The Tower is the great Castle of London, the finest piece of military architecture of the eleventh century in Europe. I would like to see it made into the 'White Tower' once more by whitewash; indeed, I would recommend much whitewash for general use.

London Railway Stations.

"Our railway stations must be the worst in the world. The pattern of disorder set at Dover seems to rule over the whole of London. Everything is temporary, save at Euston and St. Pancras. Euston, indeed, is so fine that they don't know how to use it, and most of the work is done away from the Great Hall—which Watts offered to paint—in higgledy-piggledy annexes. In Paris all railway stations are worthy public buildings. The North Station is the work of one of their greatest architects, the station for the Lyons Railway is splendid, and that for the Orleans Railway on the Quai d'Orsay is probably the most interesting building erected in Europe during the last decade."

A.A. CONVERSAZIONE.

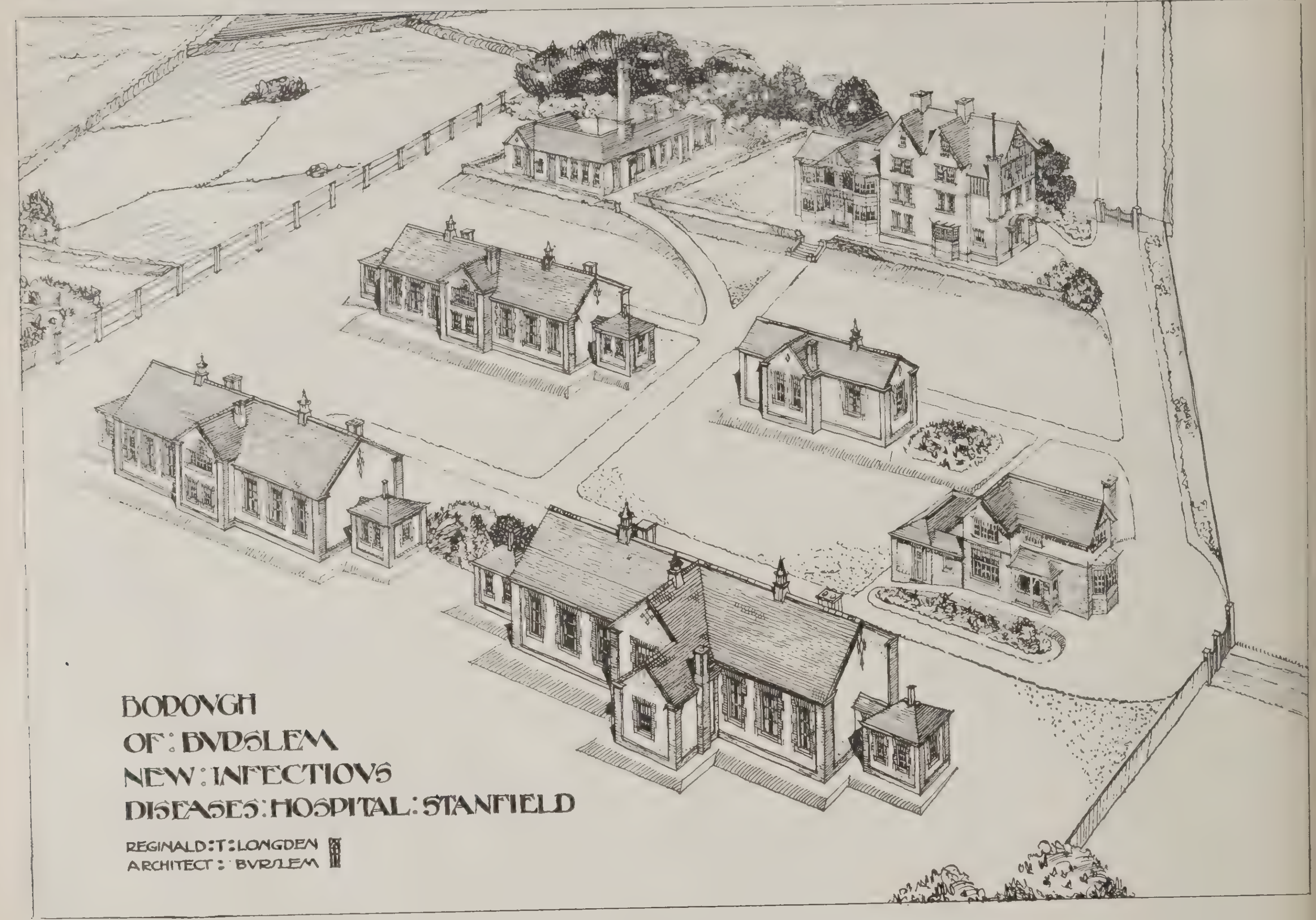
The Architectural Association Conversazione held on Thursday evening at 18, Tufton Street, Westminster, was a great success. Between 500 and 600 guests were received by the president, Mr. R. S. Balfour, and Mrs. Kenneth Balfour. Excellent music was provided by the A.A. Musical Society and Choral Society, assisted by Miss Beatrice Dunn, and in the "Long Gallery" on the first floor were exhibited some very interesting collections of drawings, sculpture, stained glass, silver ware and enamels, as well as a collection of Japanese swords, daggers, &c., lent by Mr. Matt. Garbutt; while on the second floor were shown drawings done in the School of Architecture, together with photographs taken on the annual excursion by Mr. A. W. Hennings, travelling studentship drawings by Mr. A. Winter Rose, and some very interesting photographs of Grecian buildings by Mr. Ronald P. Jones. These collections are well worth seeing. They are on exhibition all this week up to one o'clock on Saturday. Among the pencil sketches are some exquisite examples by Mr. Reginald Blomfield, some clever etchings by Mr. Ralph Knott, and other interesting drawings by the late Mr. J. Burgess, Mr. Walter Millard, Mr. Walter Cave, Mr. J. B. Fulton, Mr. C. E. Mallows, Sir Aston Webb and others; while in the Sculpture section is shown work by Mr. Goscombe John, Mr. Derwent Wood, Mr. Lynn Jenkins, Mr. Drury, Prof. Lanteri, Prof. Moira, Mr. Hodge, Mr. Schenck, Mr. Roscoe Mullins, &c. The stained glass includes examples by Mr. Silvester Sparrow, Mr. Whall, Mr. Spence, Mr. Arnold, Messrs. Bryans and Webb, and Mr. Dudley Forsyth.

The evening was also the occasion of the appearance of

"Tthe Purple Patch"

in its "fifth spasm." We were disappointed, however, to find that it had fallen from its high estate, for, with the exception of one or two "Limericks" and an amusing conversation on the telephone between a lady student and others, there is nothing very clever in it. We take the following extract from the telephone conversation :—

> "They all say I'm getting on awfully well. No; they won't let me learn about drains, and I do so want to know what a mantrap is, or whatever you call the horrid thing. Oh, but we often go out, Last week we went to see a perfect duck of a building—crushed strawberry brick, trimmed with old gold stonework, and such a beautiful Eu-de-Nil roof, with teeny-weeny little dormer windows."



BURSLEM ISOLATION HOSPITAL.

The new Burslem infectious diseases hospital which was opened recently at Stanfield occupies a site with an area of between six and seven acres. The site has a decided slope from east to west, thus enabling the buildings to be grouped in terraces, and giving the advantages of increased light and air. The planning of the buildings generally has been ruled to a certain degree by the fact that it was desired to use the existing residence on the site as a part of the new administrative block.

The main entrance is on the south side of the site, and is approached by way of the Hamil Road and Lorne Street. A porter's lodge has been erected in immediate conjunction with this entrance.

The blocks for the treatment of patients are grouped in the rear of the lodge, and provide total accommodation for 40 beds. These may, however, be supplemented by the addition of about 48 cots in case of epidemic, as ample room has been provided to meet the Local Government Board's requirements should such a contingency arise. These pavilions are four in number, there being a 12-bed typhoid fever pavilion, a 12-bed scarlet fever pavilion, a 13-bed diphtheria pavilion, and a 3-bed isolation pavilion. Each 6-bed ward is 36ft. by 26ft., and 13ft. high, giving a floor area of 156ft. and a cubical air space of 2,028ft. per patient, which is rather in excess of the Local Government Board's requirements. The wall surfaces and ceiling are plastered with Adamant, and have a hard and impervious surface. All angles of walls, ceilings, windows, doors, &c., throughout are plastered in the form of a hollow cove, allowing no lodgment whatever for dust or crevices in which dirt or germs can accumulate. The angle between the floor and wall is executed in light-green glazed bricks with coved hollow angle and tight joints. The floor is laid in bone-dry pitch-pine boarding, with secret-nailed joints, and the whole is finished with a perfectly smooth and polished surface. The wards are heated by means of a centrally-placed hot-air stove. At the end of each ward, a cross-ventilated passage gives access to an annexe, which comprises bath-room, w.c., and sink. The bath-room contains a specially constructed bath on wheels with india-rubber tyres, so that it may be wheeled to the bedside of the patient, or, of course, used in the bathroom. Each annexe has tiled floors and a white-tiled dado, executed by Messrs. Wade, of Burslem. A small low-pressure hot-water heating apparatus has been installed in each annexe by Messrs. Tagg & Co., of Newcastle, which serves both for heating purposes and the hot-water supply for bath, sink, &c.

On the first floor of each block and approached by a staircase from the hall is a large playroom for convalescent patients fitted up with cupboards for toys, &c., and heated by well-fires.

The single-bed ward of the diphtheria pavilion has been added for the reception of paying patients or for operations necessitated in critical cases, and is carried out as an annexe off one of the main wards.

The laundry and disinfecting block receives the disinfected linen and passes it into a steam disinfector, and thence to the disinfected linen-room and laundry. The receiving-room of this block is fitted with sorting bins, and the washing-room has a modern plant installed by Messrs. Manlove, Alliott & Co., Nottingham. From the washing-room and store the clothes are passed into the ironing-room, and thence to the delivery-room. The mortuary building is near to the laundry, and comprises the dead-house, *post mortem*-room, and viewing passage.

The patients as cured are passed into the discharge block, which is situated at the rear of the lodge and contains undressing, bath and dressing rooms.

The administrative block has very ample accommodation for all staff purposes and has been so designed as to meet the requirements of the hospital should extensions of the ward blocks be necessary. The existing house has been adapted and altered to the requirements of the cooking and servants' department, and a large addition has been built to the south for the matron and nurses. The night nurses occupy the second floor, which has seven bedrooms additional, store for linen in use, bath-room, &c. The third floor comprises a large box-room and tank-room, which contains the water-tanks for the whole institution.

The buildings are faced with Messrs. Boulton & Co.'s (Longport) red facing bricks, relieved by broad stretches of cement rough-cast. The roofs are of Messrs. Stanley Brothers' red-brindled tiles, and the main gables of the administrative block are carried out in half-timber. The woodwork and ironwork are painted outside in green, while inside the woodwork is stained in green and varnished. Electric lighting has been installed throughout. The whole of the ironmongery has been specially made to the architect's designs by Mr. James Gibbons, of Wolverhampton.

The drainage of the institution has received special attention, and separate systems have been laid for sewage and surface water respectively. Each block is cut off from all others by intercepting chambers and traps. The sewage is bacterially treated on the site, the effluent being turned into a ditch near by.

The general contractors were Messrs. J. H. Broadhurst & Sons, of Burslem. Messrs. Doulton and Co. supplied the hot-air stoves, and have supplied the whole of the sanitary fittings, which are of special hospital pattern. The well-fire and bedroom grates have been supplied by Messrs. Shaw & Adams, of Tunstall, and the whole of the ranges by Messrs. Pidduck & Beardmore, of Burslem.

It is expected that the total cost of the hospital, inclusive of the cost of the land, will be between £10,000 and £11,000. The architect is Mr. Reginald T. Longden, of Moorland Road, Burslem. Mr. Mark Simpson, building inspector to the Corporation, acted as clerk of works.

Correspondence.

Misrepresentations about "Velure" Paint.

To the Editor of The Builders' Journal.

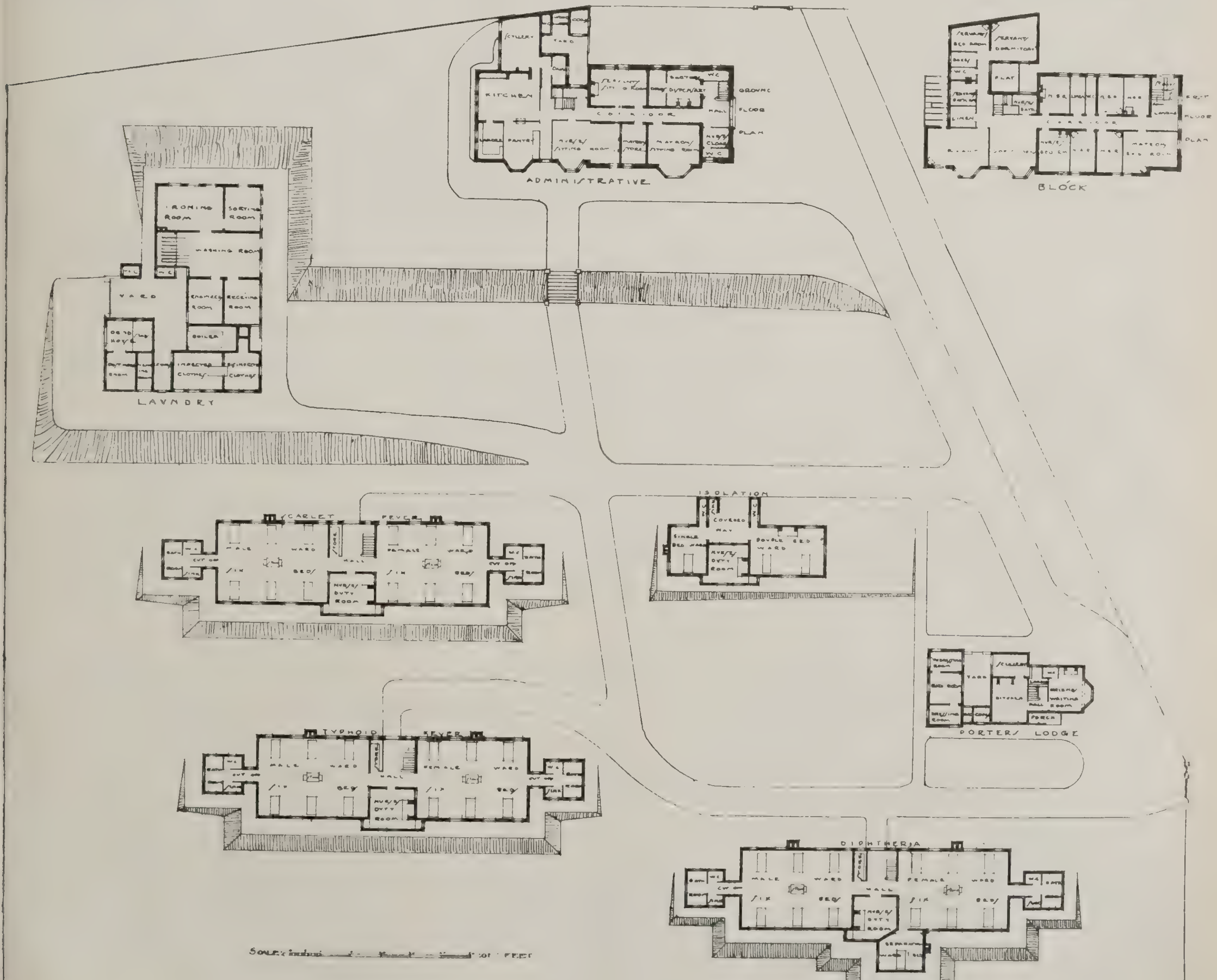
Sir,—We desire to make known certain methods which appear to be creeping into the paint business.

Some years ago we placed "Velure" on the market. It has commanded a large sale and a great reputation, with the usual result—that many articles have since been introduced claiming similar properties. For the most part competitors have been honourable firms, selling their goods, as we have done, on their own merits. But there is one whose plan has been as follows:—Knowing the reputation of "Velure," they have, wherever their representatives have found it on sale or in use, tried to persuade our customers not that their paint was as good or better, which, if they believed it, they were perfectly entitled to assert, but that theirs is *the same article* as "Velure." Of course, the statements are not straightforwardly made in such a form as to enable us to test them in a law court, but the impression has been conveyed in different ways, and, in some cases with success, to some of our clients, who have bought at a lower price an article which they thought was "Velure" under another name, and only discovered in use to their cost how inferior it was.

Only last week a customer in the Midlands informed one of our representatives that the article we refer to was "made in the same factory as 'Velure.'" On taxing the local agent with this falsehood the statement was of course denied, and our client's impression explained away on a totally different ground. The impression has been given all the same.

Another client of ours told us he understood that the proprietors of this article were the original makers of "Velure," and that they had deferred bringing out their paint until their contract for supplying "Velure" had expired, the inference being that the two articles were identical. To another the same statement was made about the medium used for making "Velure." Of course, both alike are untrue. "Velure" and its medium have always been made in the same factory, which has been repeatedly enlarged for the growing trade. They are as incapable of making "Velure" as, apparently, of making a legitimate trade for their paint on its own merits, so they use a competitor's reputation to steal that competitor's business.

For some time we have treated this illegitimate competition with contempt, but owing to the persistence of such reports and the elusive nature of the fictions, which make it impossible to bring them to the test of an action at



INFECTIOUS DISEASES HOSPITAL, STANFIELD, BURSLEM.

law, may we ask the publicity of your columns to protect our customers, many of whom read your paper, by warning them that all statements as to "Velure" being the same as any other paint are absolutely untrue.—Yours truly,

C. CHANCELLOR & CO.
13, CLERKENWELL ROAD, E.C.

Building Stone near Tavistock

To the Editor of THE BUILDERS' JOURNAL.

SIR,—I notice on p. 213 of your issue for October 31st "H. Y. M." states that "limestone from Pomphlette is suitable for window dressings, *tracery*, &c." This is wrong, as it is quite impossible to do tracery work in Plymouth limestone. The best of this stone is supplied by Messrs. Sparrow & Co. from their quarry at Radford, Hooe Lake, which is near Pomphlette, and is generally used for nobbled facings, and worked either to a quarry or tooled face. Window dressings and tracery here are worked either in Portland, Ham Hill or Doulting stone, or, if cost is not a question, in granite. The general facing for buildings around Tavistock is polyphant stone from a quarry near there: this is a soft stone when quarried, and easily worked, and it hardens with exposure.—Yours truly,

PLYMOUTH. A. W. LETHBRIDGE.

Enquiries Answered.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional, or legal matters.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Stresses from Cantilever Supporting a Gallery.

MACCLESFIELD.—X. writes: "The diagram represents a cantilever supporting seats. The distributed load on one part is 4 tons, and 6 tons on the other. What pressures do these loads cause upon the wall and column respectively?"

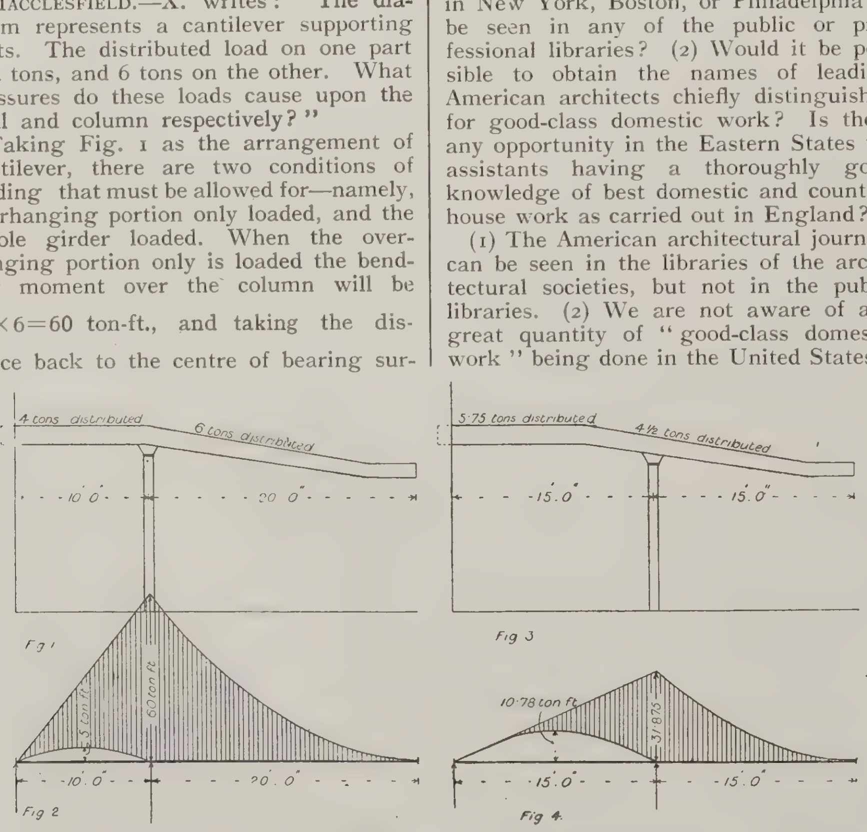
Taking Fig. 1 as the arrangement of cantilever, there are two conditions of loading that must be allowed for—namely, overhanging portion only loaded, and the whole girder loaded. When the overhanging portion only is loaded the bending moment over the column will be $\frac{20}{2}\times 6=60$ ton-ft., and taking the distance back to the centre of bearing surface in wall as 10ft. 6ins., the upward pull at wall will be $\frac{60}{10.5}=5.7$ tons, which is the measure of the anchorage required. The load on the column will then be $6+5.7=11.7$ tons. When the whole length of girder is loaded, the bending moment diagram will be as Fig. 2, the upward pull on anchorage will be $\frac{6\times 10-4\times 5}{10.5}=3.8$ tons, and the load on column $6+4+3.8=13.8$ tons. With a maximum bending moment of 60 ton-ft. a rolled steel joist with a tabular value $60\times 8=480$ will be required. This will be given by a B.S.B. 27, 16ins. by 6ins. by 62 lbs. rolled steel joist. Considerable economy may be gained by increasing the distance between wall and column from 10ft. as at present to 15ft. and making a corresponding reduction in the overhanging portion, as in Fig. 3. With this alteration the loading would approximately be $5\frac{3}{4}$ tons between column and wall, and $4\frac{1}{4}$ tons on outer end. Then the maximum upward pull at anchorage would be $4.25\times\frac{15}{2}-5.75\times\frac{15}{2}\div 10.5=-1.07$ tons, and a minus pull means a push, so that it will be a downward load on wall of, say, 1 ton. The maximum load on column will be $4.25+5.75-1.07=8.93$, say, 9 tons; and the maximum bending moment as in Fig. $4=4.25\times\frac{15}{2}=31.875$, say, 32 ton-feet; the section required to meet this would be that corresponding to the tabular value $32\times 8=256$ and given by a B.S.B. 21, 12ins. by 6ins. by 44lbs. rolled steel joist. With built-up beams the same relative advantages would appear.

HENRY ADAMS.

Architecture in the United States.

ABINGDON.—XIT writes: "(1) Are the American architectural journals published in New York, Boston, or Philadelphia to be seen in any of the public or professional libraries? (2) Would it be possible to obtain the names of leading American architects chiefly distinguished for good-class domestic work? Is there any opportunity in the Eastern States for assistants having a thoroughly good knowledge of best domestic and country-house work as carried out in England?"

(1) The American architectural journals can be seen in the libraries of the architectural societies, but not in the public libraries. (2) We are not aware of any great quantity of "good-class domestic work" being done in the United States—taking an English standard. There are, however, a few men—such as Wilson Eyre, Frank B. Wright, and Elmer Grey—who are producing excellent work. You had better look over back volumes of the American papers and form your own opinion. As to opportunities for assistants, we would refer you to the leader in our issue for October 31st.



STRESSES FROM CANTILEVER SUPPORTING A GALLERY.

Fees for Preparing Plans and Elevations for Builders.

LONDON.—SUBSCRIBER writes: "Please give a scale of charges for preparing plans and elevations of houses for builders."

See "Specification" (price 3s. 3d. post free from these offices). We think $2\frac{1}{2}$ per cent. sufficient for plans and elevations.

Building Construction Examinations.

GLASTONBURY.—F.O.J. writes: "Have the South Kensington building construction examinations any connection with those of the R.I.B.A.?"

The two examinations are entirely distinct: they have no connection with one another.

Notes and News

Mr. Reginald T. Blomfield, A.R.A., has been elected an Honorary Fellow of Exeter College, Oxford.

The R.I.B.A. Kalendar for 1906-7 has just been issued from 9, Conduit Street, W., price 2/6.

Sir A. Brumwell Thomas, included in last week's birthday honours list, was the architect of the new City Hall at Belfast and the new Town Hall at Woolwich.

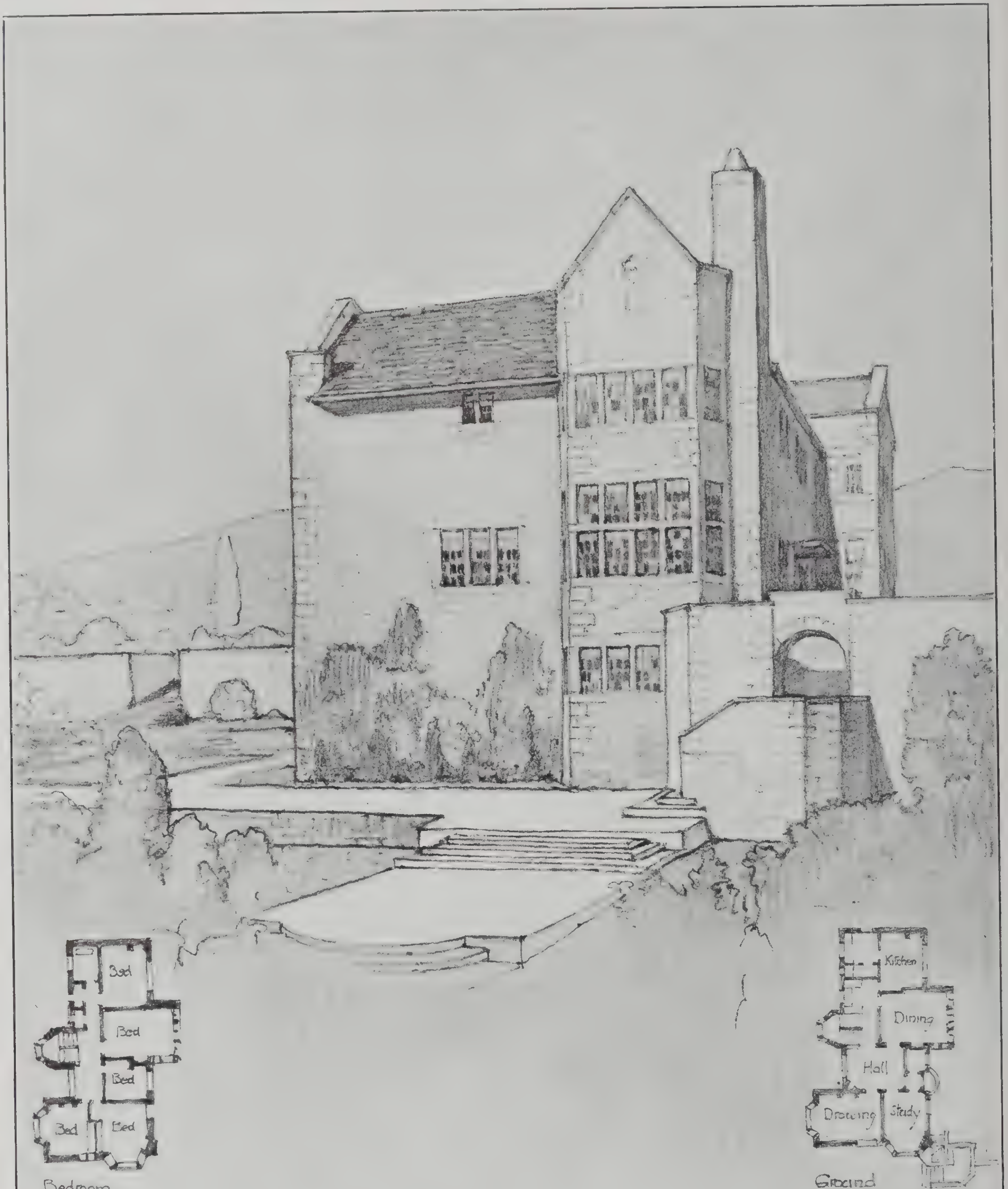
"The Byzantine Churches of Constantinople" formed the subject of a lecture delivered by Prof. Charles Gourlay, B.Sc., A.R.I.B.A., before the meeting of the Glasgow Technical College Architectural Craftsmen's Society on November 2nd.

A New Hippodrome has been erected at Putney. It accommodates 2,000 people. Messrs. Waring and Gillow have been responsible for the upholstering, while the warming and ventilation has been carried out by Messrs. Hendry and Pattisson, of Lavender Hill, S.W.

Dispute about Walsall Municipal Buildings.—Litigation is pending over the erection of the new municipal buildings at Walsall. The corporation has resolved to defend an action by Messrs. Armitage and Hodgson, contractors, Leeds, for a disputed amount of £2,846, and if necessary to sue the architect, Mr. James S. Gibson, F.R.I.B.A., for the amount and all costs for giving orders for extra works without authority.

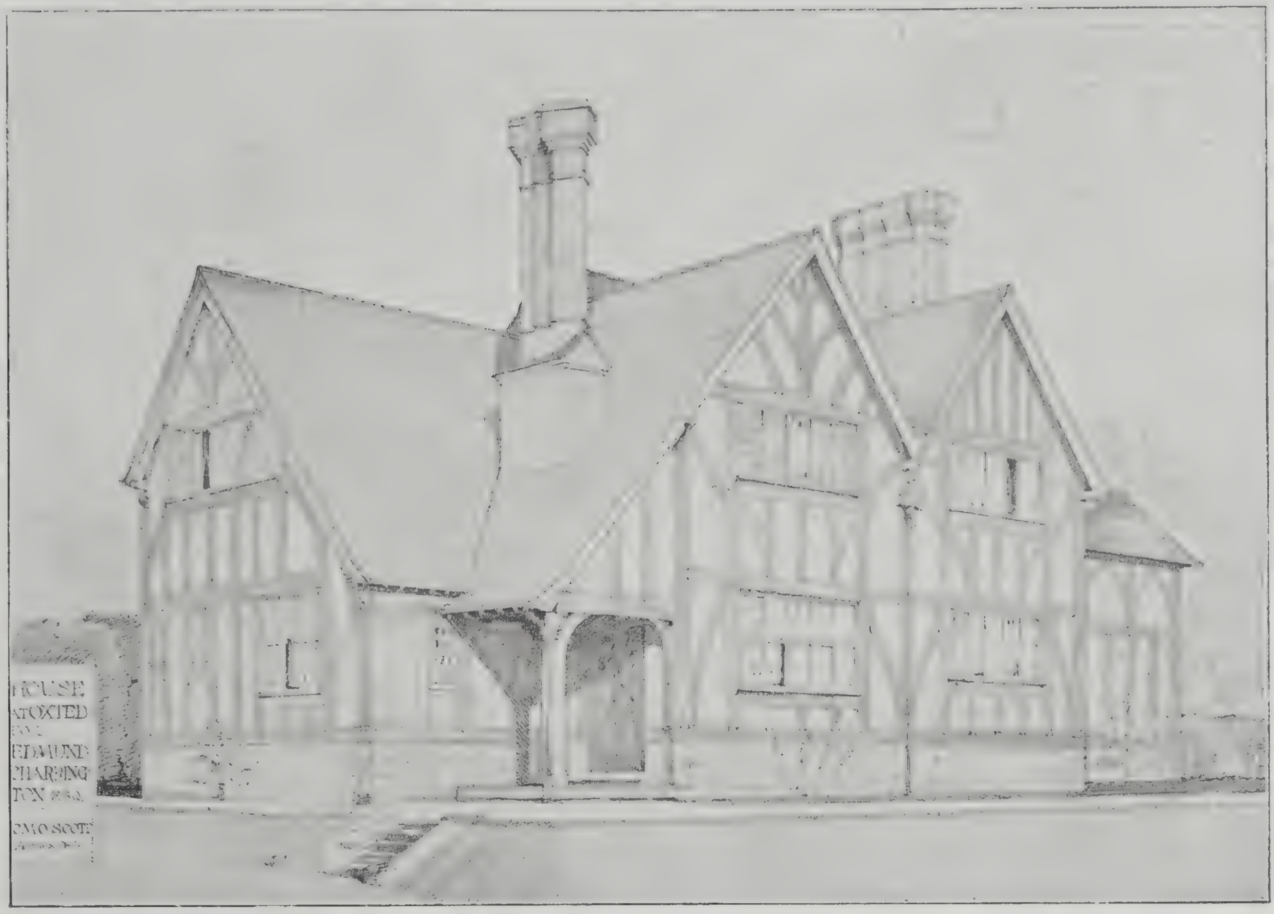
The Architectural Treatment of Stonework.—At last Thursday's meeting of the Sheffield Society of Architects and Surveyors Mr. W. J. Hale, F.R.I.B.A., delivered a lecture on "The Architectural Treatment of Stonework," being the first of a series dealing with the treatment of materials used in building. Mr. Hale laid stress on the necessity for materials to be treated according to their nature, qualities and limitations, but, quoting Ruskin that "all architecture proposes an effect on the human mind, not merely a service to the human frame," said that although a particular feature might not be capable of defence on strictly utilitarian grounds, it might still justify its existence as satisfying a man's trained artistic perceptions.

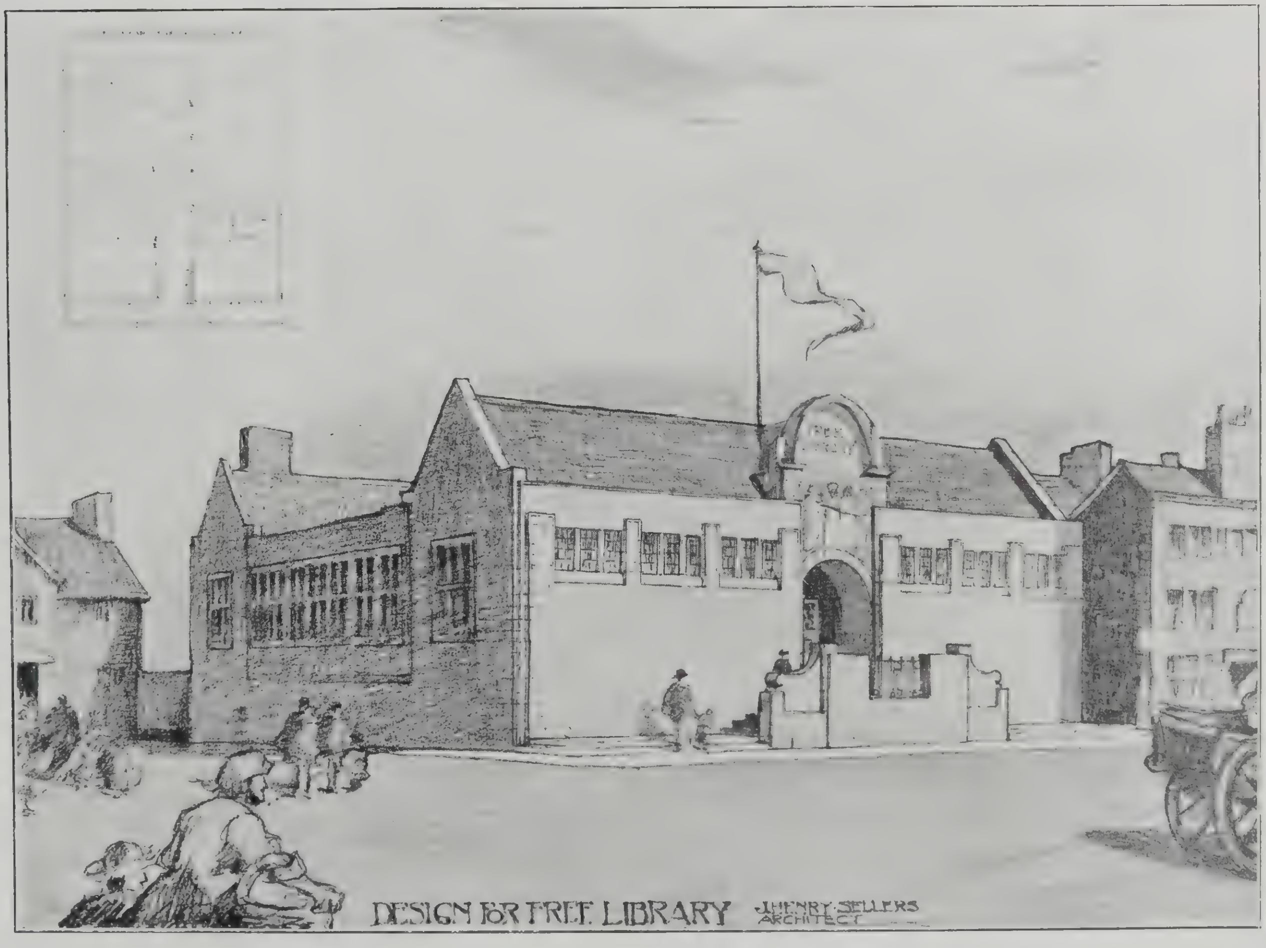
LIBRARY
OF THE
UNIVERSITY OF ILLINOIS



PARSONAGE HOUSE, THURLSTONE, NEAR PENISTONE, SHEFFIELD.
EDGAR WOOD, A.R.I.B.A., ARCHITECT.

Supplement to
THE BUILDERS' JOURNAL AND ARCHITECTURAL ENGINEER,
Wednesday, November 14th, 1906.





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Notes on Competitions

List of Competitions Open.

Deposit for conditions given where known.

DATE OF DELIVERY	COMPETITION.
Nov. 30	LIBRARY AT NEWTON-IN-MAKERFIELD.—Cost £4,000. Particulars from C. Cole, clerk to U.D.C., Town Hall, Earlestown, Lancs. No deposit.
Dec. 12	LAY-OUT OF RIDDRIE ESTATE, GLASGOW.—Premiums of £75, £50 and £25. Particulars from A. W. Myles, town clerk, City Chambers, Glasgow. No deposit.
Dec. 31	DUAL SECONDARY SCHOOL AT GOOLE.—Premiums £50 and £25. Particulars from James W. Johnson, clerk to Governors, Council Offices, Goole. Deposit £2 2s.
Dec. 31	NURSES' HOME AT GENERAL HOSPITAL, WOLVERHAMPTON.—Particulars from J. Stephen Neil, House Governor and Secretary, General Hospital, Wolverhampton. No deposit.
Dec. 31	BATHS AT ASHTON-IN-MAKERFIELD.—Limited to architects in Wigan and Leigh Poor Law Unions. Particulars from A. Sykes, clerk, Council Offices, Ashton-in-Makerfield. No deposit.
1907 Jan. 19	LIBRARY AT PLYMOUTH.—Premiums £50, £30 and £20. MUSEUM AND ART GALLERY AT PLYMOUTH. Premiums £25, £20 and £10. Limited to local architects. Particulars from Borough Librarian, Plymouth.
Feb. 1	CHILDREN'S HOSPITAL AT SUNDERLAND.—Premiums of £100, £50 and £25. Particulars from T. Robinson, secretary, Infirmary Offices, Bank Buildings, Sunderland. Deposit £1 1s.
No date.	ELEMENTARY SCHOOL AT SLOUGH, for 600 children.—Limited to local architects. Particulars from C. G. Watkins, Education Secretary, Education Offices, Aylesbury, to whom applications must be sent by Nov. 30th.

Secondary School, Goole.

When a deposit of two guineas is required for a set of conditions which neither cajoleries nor promises of immediate return are able to obtain on approval, the ardent imagination of the architect pictures nothing less than a gilt-lettered volume of particulars and instructions for an edifice to accommodate many thousand scholars. The scant pages and diminutive block plan which duly appear in exchange for the deposit are provocative of no little surprise, not only on account of their extreme meagreness, but by reason of the comparative insignificance of the building required and of the appearance of a clause in which the School Governors "do not bind themselves to carry out the erection of the proposed school, or to employ the architect who is author of the plans selected for the first prize. The selected plans, with all tracings, sections, detailed drawings, and specifications relating thereto, shall, upon payment by cheque of the first and second premiums"—£50 and £25—"immediately become the absolute property of the Governors aforesaid, and under no condition will be returnable to the competing architects who designed them." This clause must be regarded very seriously, for, as it stands, the competition may become nothing more than a contest for premiums. It may be remembered that the conditions of the Hackney library competition, last December, had a similar clause as to the promoters not binding themselves to appoint the architect placed first by the assessor, but in that case a verbal assurance was given that there was no intention of applying the condition except in extreme urgency. Unless a similar assurance can be obtained from Goole, the competition had better be left severely alone. The conditions are interesting in that they contain evidence of the progress of events. This consists of three clauses printed in red at the end of the instructions. They have obviously been added since the original conditions were issued, as is shown by the comparison of an original set with one of later date. Formerly the Governors were to determine the competition, but reserved the right to obtain an independent architect to act as assessor; now, the Governors "shall appoint an independent professional architect, who shall act as assessor, to determine the competition, whose decision shall be final and binding." Formerly there was no block plan; now, "block plan containing information in regard to the levels, drainage and gas and water supply, enclosed." A block plan, as before stated, diminutive but useful. The school is to accommodate 300 students, with provision for technical and evening classes. There is no limit of cost, but economy will receive favourable consideration. A satisfactory feature is the provision of a safety margin of fifteen per cent., an unsatisfactory one is the adoption of the old-fashioned nom-de-plume method of identification. The School Governors cannot be congratulated upon their choice of models for conditions, which has resulted in the issuing and subsequent revision of a set of instructions and particulars which are still imperfect.

Nurses' Home, Wolverhampton.

A supplementary list of instructions to architects has been issued, which is significant, even in this comparatively satisfactory competition, of an abandonment on the part of competitors of the old *laisser faire* attitude, and an attempt on their part to induce approximate perfection in conditions under which they have to work. The supplementary instructions, furthermore, read pleasantly and appear to give evidence of an intention of fair dealing on the part of the promoters. The most important clause, perhaps, is one which reads "The author of the design placed first will be employed to carry out the work at the usual fee of 5 per cent. If, however, after the working drawings have been prepared no substantial builder can be found to carry out the work within 10 per cent. of the amount stated in the instructions, the Board reserve the right to pay the architect a sum fixed by the assessor in full consideration of all services." Another most satisfactory clause is "The award will be adhered to, unless there is some unforeseen or valid objection to the employment of the author of the selected design." These conditions are particularly interesting at the present moment, for they stand in sharp contrast to those of Goole, containing, as they do, all the desirable features which are lacking in the latter.

Dutch Architects and the Palace of Peace.

The Dutch architects who took part in the competition for the Palace of Peace at the Hague have made a protest against the jury's selection of M. Cordonnier's design, the cost of which exceeds the amount available. They demand that the award shall be set aside, basing their claim on the jury's admission that the conditions of the competition had not been adhered to.

Elementary School, Blackburn.

The competition for an elementary school at Blackburn, among architects practising in the county borough, has been decided in favour of Messrs. Cheers and Smith, of Blackburn, to whom the first premium of £30 is awarded. The school is to accommodate 280 scholars and is planned with a "central hall" having classrooms arranged on the front and at the sides.

Hither Green Library.

In the competition for a branch library to be built at Hither Green by the Lewisham Borough Council, at a cost of £4,500, twelve designs were submitted by local architects, and the design of Mr. Henry Hopton, of Catford, has been selected.

Baths at Birmingham.

It is proposed to invite competitive designs for baths to be built at Nechell's Park Road, Birmingham.

IN PARLIAMENT.

(By our Press Gallery Representative.)

Fatal Accidents in Quarries.

In the House of Commons last week Mr. Ellis Davies asked the Secretary of State for the Home Department what steps, if any, had been taken in view of the statement on p. 99 of the Reports on Mines and Quarries for 1905 (Labour) that accidents by falls would be reduced if more quarries were worked in steps or galleries instead of with a vertically continuous face of great height; whether he was aware that 33 per cent. of fatal accidents in quarries were due to falls; and whether, in those circumstances, the Report had been brought to the attention of quarry owners with a view to their adopting the gallery system wherever practicable.

Mr. Gladstone, in reply, said no special steps had been taken to bring this particular remark to the notice of the quarry owners. The Report itself was widely circulated by the Home Office and was reviewed at length in the trade papers. The point was, no doubt, present to the minds of all the inspectors, but they had no power to direct the adoption of any particular method of working. Special precautions against falls were contained in Nos. 1, 2 and 3 of the code of special rules for quarries which had been established at a large number of quarries. These were enforced by the inspectors.

English Stone for Irish Buildings.

Mr. William Redmond asked the Chief Secretary to the Lord Lieutenant of Ireland if he was aware that it was proposed to build the Royal College of Science in Dublin with stone imported from England; and, if so, whether he would arrange to have the stone from Clare, Donegal, and other portions of Ireland, used in this new public building, in order to help industry in Ireland.

Mr. McKenna, who replied on behalf of the Treasury, said he was informed that the brick and stone now being used in the construction of the lower storey of the new Royal College of Science, Dublin, were exclusively Irish. The designs and specifications for the remainder of the building were not yet complete, but the architects of the building had made a special study of Irish building materials and had come to the conclusion that, subject to prices being satisfactory, large quantities of them could be used in the building. The experience since gained in the construction of the lower storey justified, he believed, the anticipation that, subject to satisfactory prices and delivery, large quantities of Irish brick and stone would be used in the superstructure.

Combinations in Cement and Other Products.

Mr. Chiozza Money asked the President of the Board of Trade whether his attention had been directed to the fact that great combinations of capital, or price rings, or both, had been formed in connection with the manufacture of iron and steel, wallpaper, cement, and other products, with the result that monopolies or quasi-monopolies had been created; and whether he would consider the advisability of introducing legislation to establish public competition with the monopolists or to secure public control of the monopolised trades.

Mr. Lloyd George, in reply, said the Board of Trade was fully alive to the importance of the matter, but he was not at present prepared to introduce legislation on the subject.

The Fair Wages Clause.

Mr. Harcourt, First Commissioner of Works, informed Mr. O'Grady that it had been the practice of his Department for years past to take such measures as were considered best to secure the observance of the fair wages resolution of the House of Commons, but he had recently caused specific clauses for that purpose to be inserted in certain contracts in which they had not been so categorically expressed before.

Our Plates

The parsonage house at Thurlstone, near Penistone, Sheffield, occupies a steep hill site and is built of local rubble walling, with stone to windows, copings, &c., and stone slates on the roof. Mr. Edgar Wood, A.R.I.B.A., of Manchester, was the architect (also the delineator of the sketch reproduced) and Messrs. J. & F. Turner were the builders.

The design for a free library by Mr. J. Henry Sellars, of Manchester, was submitted in competition some time ago; it has not been carried out.

The house at Oxted, Surrey, for E. Charrington, Esq., was completed about two years ago. The external walls are almost entirely of oak-framing, backed with brickwork. The plinth is of local rubble sandstone, and the roofs are covered with old tiles. The contractors were Messrs. J. T. Williams & Sons, of Oxted, and the architect was Mr. C. M. O. Scott, of London.

A Correction.—A typographical error occurred in an article on Electric Lifts on p. 219 of our issue for October 31st. It was there stated that "To-day about 1,200 Flohr lifts are in use all over the world." The number should have been 12,000.

Ulster Society of Architects.—At the last meeting of this Society it was decided that a committee of members in Derry and district should be formed under the auspices of the Society. Considerable discussion took place in regard to the new Labourers (Ireland) Bill so far as it affected architects, and it was decided to forward to the Local Government Board the resolution passed at the annual meeting of the Society in December last, calling attention to the undesirability of salaried officials (surveyors especially) acting as architects in competition with local practitioners.

FLOOR TESTS.

Two interesting and instructive tests on fire-resisting floors constructed on the Kleine patent system were carried out at No. 19, Irongate Wharf Road, Paddington Basin, London, W., on October 31st, under the direction of Mr. A. T. Walmisley, M.I.C.E. These tests consisted in the one case of loading to destruction and in the other of the dropping of a weight from a height in order to show the resistance of the floor-construction to impact.

The Kleine system is a reinforced floor construction, in which flat iron rods are embedded in cement mortar between hollow brick blocks near the underside to take the tensional stresses, while concrete is placed upon the upper side of the brick blocks, in order to take the compressional stresses. The concrete is done away with when there are only small spans and light loads. In short, it is reinforced brick and concrete construction.

The advantages

offered by the hollow bricks are that the centering has to remain in position only a short time, the brick soffit dries quickly, so as to be ready for plastering immediately the centering is removed, reduction of weight, and deadening of sound.

The construction of the floor in the weight test was as shown in Fig. 1, which also represents the way the load was put on—this being the scientific method adopted at Charlottenburg, whereby an evenly-distributed load is accurately applied, and no opportunity given for arching to occur, as generally happens when loads are applied by means of bricks, bags of cement, &c. The patentees deserve every credit for advocating

a rational system of loading,

instead of the usual system, which only serves to deceive the unknowing and to lead those who see through the deception to become prejudiced against forms of construction which rely upon such tests.

As shown in Fig. 1, a portion of a floor 5ft. 3½ins. in width with a 12ft. clear span was supported on steel joists, 6ins. by 3ins., held in position by ballast concrete flanching on the top of dwarf walls 13½ins. wide. The soffit of the floor was thus 2ft. 7½ins. above the ground. This slab was separated by ½in. boarding from the adjoining portions, on each side measuring 1ft. 5½ins. in width, so that the centre portion might act independently. The side portions were adopted merely to show that there was no side thrust.

The floor was constructed of hollow bricks, measuring 6ins. by 4ins. by 10ins., running in rows, alternately placed so as to be 6ins. and 4ins. deep. Iron bars about 1¾ins. by ⅙in. thick were embedded in the centre of each longitudinal joint near the underside of the floor, their ends being turned at right angles against the outside ends of the bricks. There were 10 rods, and thus the proportion of reinforcement was about .4 per cent. Concrete was placed upon the top of the hollow bricks, so as to bring the depth of the floor slab up to 12ins. The cement mortar in which the bricks were laid and the rods embedded was proportioned 3 to 1. The concrete was proportioned 4 ballast, 2 sand and 1 cement. The floor was designed to sustain a safe load of 2cwt. per ft. super., with a factor of safety of 4.

The Loading.

A layer of sand, 6ins. deep, was spread over the central area of the slab and maintained in position by planks placed on edge. This sand served to evenly distribute the load. The loading was done with pig iron carefully weighed in batches and applied from a platform built round the slab, the pig iron being piled with intervening spaces, so as to avoid the possibility of a concealed arch, and so as to ensure absence of continuity.

The deflection was observed throughout the test, and it was nil up to 5.96cwts per sq. ft. When the load had been increased uniformly to 7.4cwts. per sq. ft. the deflection was $\frac{3}{20}$in. This was increased to ⅕ of an inch when the distributed load had become 25 tons, 1cwt., 1qr., 14lbs., or 7.89cwts. per sq. ft. Five minutes after this reading was taken the floor collapsed. This shows that the factor of safety of 4 was practically obtained, and the estimated strength proved correct. The appearance of the collapsed floor is shown in Fig. 2.

The Result.

Upon examination of the floor it was seen that the tension bars had pulled through the concrete at one end, and were unbroken; from the portions of the concrete it was obvious that this was not only of very poor composition, the voids not being all filled, but had never properly set. The aggregate was not a good one, and had been improperly mixed; the aggregate had been mixed wet, and the floor had been kept very wet just after construction, and for a good many days before the test it had been kept continually wet by reason of the rainy weather. Moisture is known to deleteriously affect adhesion. Unfortunately no direct test was made to

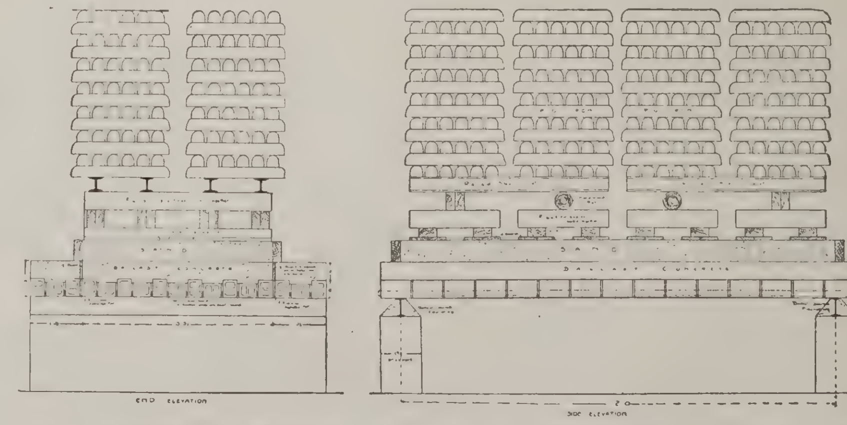

FIG. 1. SHOWING CONSTRUCTION OF FLOOR AND ARRANGEMENT OF WEIGHT TEST.

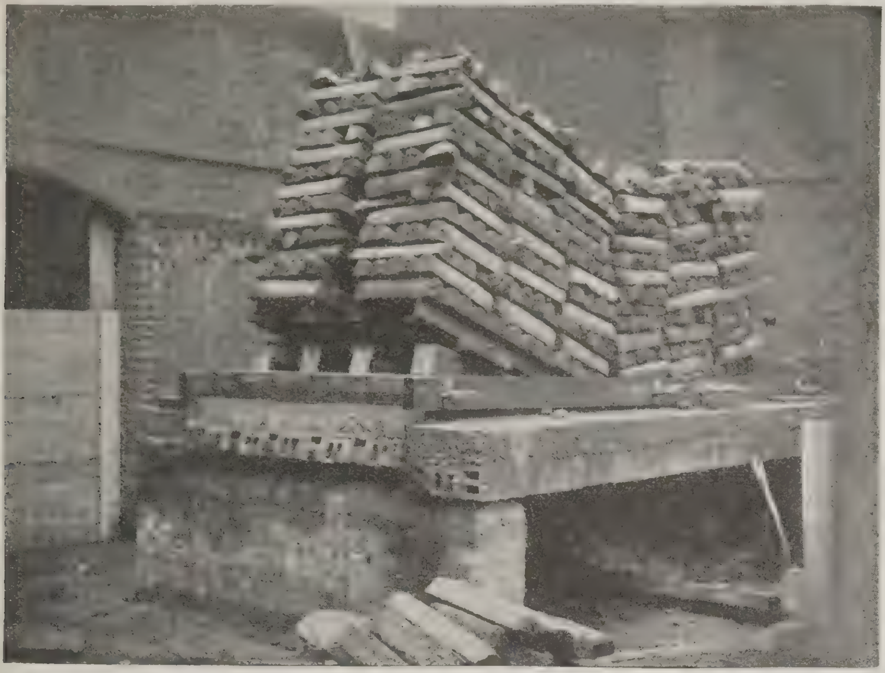

FIG. 2. THE COLLAPSED SLAB.

show the compressive strength of this concrete, and, although its weakness may easily have been the primary cause of failure, the fact of the rods having pulled through the concrete and not being ruptured would suggest that faulty adhesion was the primary cause, although the oblong section of these bars gave a large surface for adhesion, and it was probably not required to develop more than 20lbs. per sq. in. The other floor test permitted the rods to be examined, and we noticed there that the cement mortar in which the rods had been embedded had adhered very slightly to the rods in some parts. The weight test is particularly instructive in emphasising the importance of great care being taken in the proportions and choice of aggregates for reinforced concrete.

The Impact Test.

The impact test consisted in dropping a block of stone weighing 84lbs. from a height of 9ft., as shown in Fig. 3. The slab in this case had a clear span of 8ft. and was 3ft. 6ins. wide. There was no concrete on the upper surface of the hollow bricks. A uniformly distributed load of 4cwt. per sq. ft. was removed, and the weight was allowed to fall upon a 1in. layer of sand upon which the load had been standing. The result of the impact was simply an indentation of the sand. The sand was then removed and the first fall of the stone resulted in chipping the upper surface and producing a slight longitudinal crack. The second time the impact caused the bottom half of two bricks to fall off for a length of about 18ins., and the longitudinal crack to be emphasised. The third time the weight fell, a hole of about 8ins. square was made in the brick floor, but the iron bar remained intact and sustained the weight. This test was conducted in order to show that the Kleine floors are not liable to damage from falling weights while in course of construction. The longitudinal crack which occurred calls attention to the reason why reinforced concrete constructors early found the advisability of putting small transverse rods in floors liable to heavy concentrated loads. In the stronger Kleine floors, which would be necessary in such circumstances, the weight test showed that the deflection would be small and the upper surface of concrete might generally be relied upon to transmit a concentrated load far enough to avoid longitudinal cracks.

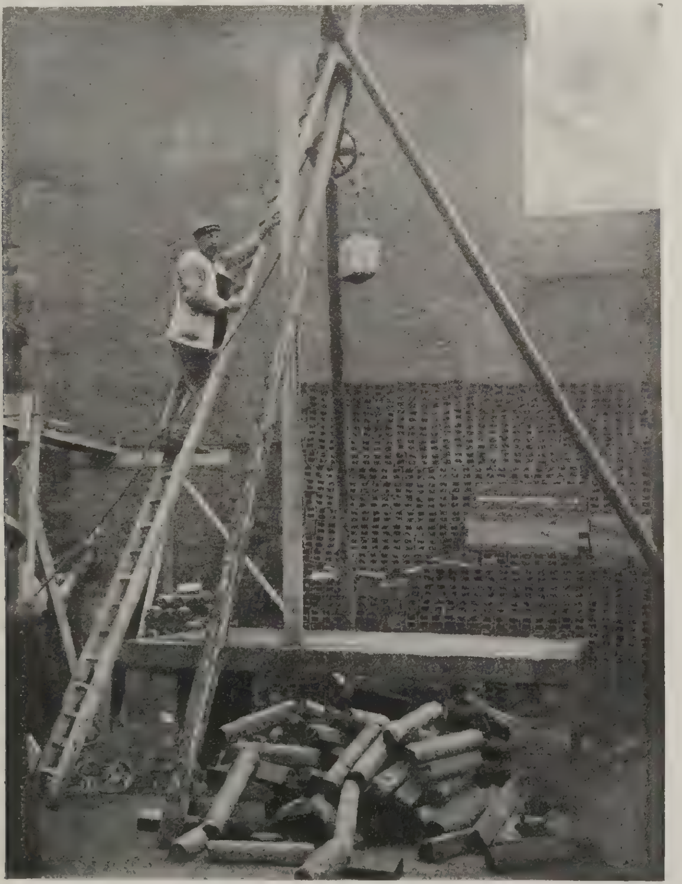

FIG. 3. IMPACT TEST.

It is obvious from these tests that the Kleine system of constructing fire-resisting floors is an excellent one and may be thoroughly relied upon if adequate precautions are taken in the placing of the tension rods and the mixing and proportioning of the concrete, and if the hollow bricks are made of porous terra-cotta. The first test for loading, if the concrete had been made to the patentees' specification, would have stood a much greater load.

We may call the attention of readers to the fact that the Kleine system of flooring is now being used throughout the Imperial Hotel, Russell Square, London, where it can be inspected by anyone interested.

Partnerships

[*The date when the partnership was dissolved is given in parenthesis where known.*]

SMYTH & DEARLE, quantity surveyors, London (June 30).

BADGER & POWER, builders and contractors, Birmingham (Oct. 16).

HARDY & KELLETT, joiners and builders, Denton (Oct. 17). Debts by J. Hardy.

J. BIRD & SON, brick manufacturers, &c., Ipswich (Oct. 1). Debts by F. Bird.

HENNELL & SON, architects and surveyors, London (Oct. 30). Debts by A. R. Hennell.

HIGGS & SPIERS, architects and surveyors, Leicester (Oct. 8). Debts by J. H. Higgs.

EBBS & BARTON, builders and contractors, etc., Norfolk (Oct. 19). Debts by W. H. Barton.

POOL & CO., builders' merchants, Wimbledon (Oct. 1). Debts by C. L. Peckham, who continues.

ROSE & ABBOTT, painters, plumbers and house decorators, Hanslope (Sept. 29). Debts by J. Rose.

JACKSON & BARKER, builders and house decorators, Hornsey (Sept. 29). Debts by A. B. Jackson.

MORTON & BAILEY, plasterers, Gorton (Oct. 11). Debts by J. Bailey, who continues in his own name.

BRAZELL & WHITTON, builders and contractors, West Hartlepool (Oct. 12). Debts by W. W. Brazell.

REPPEN & TOYNTON, plumbers, glaziers and gasfitters, Nottingham (Sept. 12). Debts by either partner.

TAYLOR & JACKSON, sanitary engineers, builders, &c., Oldham (Oct. 24). Debts by R. Jackson, who continues.

HOLT & GREAVES, painters and decorators, Leeds (Oct. 15). Debts by J. Holt, who continues in his own name.

R. H. & L. WILLCOCKS, builders and decorators, East Finchley (Oct. 11). Debts by R. H. Willcocks, who continues.

CONE & SMITH, builders and house decorators, Stamford Hill (Oct 30). Debts by W. H. Cone, who continues.

CROSS & BELL, builders and contractors, Chester (Sept. 30 as regards D. Cross). Debts by J. & D. Bell, who continue.

LIGHTHILL & CLARKE, timber merchants, Manchester (Aug. 31). Debts by L. Lighthill, who continues as L. Lighthill & Co.

S. D. ROBINS & R. WILSON, architects and surveyors, Sunderland (Oct. 1). Debts by R. Wilson, who continues in his own name.

Complete List of Contracts Open.

WITH a few exceptions, news of Contracts Open are not repeated after they have been published once in these columns, so that readers will find particulars in our previous issues of other contracts that still remain open.

Unless expressly stated to the contrary, all deposits required for bills of quantities, &c., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair-wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

Nov. 16. Newry.—*Erection of fences* at each of the nine houses at present being erected in the Rural District for the Newry No. 2 R.D.C. Persons tendering to quote at per Irish perch. Tenders to be lodged with W. R. Bell, clerk of the Council, Clerk's Office, Council Chambers, Newry, not later than 5 p.m. on Nov. 16. Specifications can be seen at the above office.

Nov. 17. Ynyshir, Rhondda.—*Erection of a minister's house* at Station Road, Ynyshir. Plans and specifications may be seen, and tenders must be sent on or before Nov. 17 to E. Thomas, 16, South Street, Ynyshir.

Nov. 17. Pengam.—*Additions and alterations* to the Council school, for the Monmouthshire Education Committee. Plans and specification may be seen either at the C.C. Offices, Newport, or with D. Phillips, Greenmeadow, Pengam. Sealed and endorsed tenders to be delivered to C. Dauncey, C.C. Offices, Newport, Mon., not later than Nov. 17.

Nov. 17. Barrow-in-Furness.—*Removal of old galleries* and erection of new ones, at Holker Street Infants' School for the Corporation. Further particulars may be obtained on application at the Borough Engineer's Office. Sealed tenders to be delivered not later than 12 noon on Nov. 17 to C. F. Preston, town clerk, Town Hall, Barrow-in-Furness.

Nov. 17. Worcester.—*Additions, &c., to the electricity generating station* in the Hylton Road, for the Electricity Committee of the Corporation. Persons desirous of submitting tenders must forward their names and addresses to the City Architect, Worcester Chambers, Pierpoint Street, Worcester, on or before Nov. 8. The plans and specifications may be inspected and other particulars obtained of H. Rowe, city architect, Worcester, where tenders (on forms to be supplied) are to be delivered on or before Nov. 17. Fair wages clause.

Nov. 17. Settle, Menwith, Conisborough.—*Alterations, &c*, Settle.—Proposed temporary secondary school (builder, joiner, plumber). Alterations to Menwith-with-Darley provided school (builder, joiner, slater, plumber, plasterer, painter). Additions to teachers' house, Conisborough.—Morley Place provided school (builder, joiner, slater, plumber, plasterer, painter), for the West Riding C.C. Plans may be seen, and quantities obtained, on application to J. Vickers-Edwards, county architect, County Hall, Wakefield. A deposit of £1 is required for the Menwith-with-Darley school only. Cheques to be sent to the West Riding Treasurer, County Hall, Wakefield. Sealed tenders, properly endorsed, to be sent to the County Architect not later than 10.30 a.m. on Nov. 17.

Nov. 19. Cardiff.—*Erection of new schools* for 448 children off Clarence Road, Cardiff, for the Rev. Gilbert Heaton, M.A., and the managers of St. Mary's National Schools, Cardiff. Plans and specifications may be seen and quantities obtained of Veall & Sant, architects, Cardiff. Sealed and endorsed tenders to be sent to them not later than Nov. 19.

Nov. 19. Pengam.—*Erection of post office* and business premises at Pengam for the Rev. Ll. Jenkins. Plans and specification can be seen and bills of quantities obtained at the architect's office, Station Road, Bargoed, on payment of £2 2s. Sealed and endorsed tenders to be sent to G. Kenshole, architect and surveyor, Bargoed not later than Nov. 19.

Nov. 19. Luing.—*Erection of shelter sheds*, including mason work, joiner work, slater work, and plumber work, at Luing Public School, and also for the mason work and erection of fence in connection with water supply for same school for Kilbrandon and Kilchattan School Board. Plans and specifications will be seen with A. Cowan, Easdale, clerk to the Board, with whom sealed offers are to be lodged on or before Nov. 19.

Nov. 19. Mexborough.—*Erection of a new police station* at Mexborough. Plans may be seen, and bills of quantities obtained. A deposit of £1 is required. Cheques to be sent to the West Riding Treasurer, County Hall, Wakefield. Sealed tenders, properly endorsed, to be sent to J. Vickers-Edwards, county architect, County Hall, Wakefield, not later than 10.30 a.m. Nov 19.

Nov. 19. Cupar.—*Contract No. 1: Construction of a storage reservoir*, the laying and jointing of 4 and 3-in. diameter cast-iron pipes, the fitting of valve, hydrants, and other relative works, for the Fife C.C. Drawings may be seen and copy of specification and schedule of quantities and form of tender obtained from Bruce, Proudfoot & Macrae, civil engineers, 67, Crossgate, Cupar, upon payment of £2 2s. Contractors will be shown over the proposed line of pipes, &c., upon giving one day's notice to the engineers. The form of tender, specification, and schedule of quantities must be delivered in a sealed cover to W. D. Patrick, district clerk, County Buildings, Cupar, marked "Kettle Contract No. 1," not later than 10 a.m. on Nov. 19.

Nov. 20. Queensbury.—*Erection of a house* at Scarlet Heights, Queensbury. Plans, &c., may be seen, and quantities obtained, at the undermentioned address. Tenders to be delivered to H. F. Sharp, P.A.S.I., architect, &c., 1, Briggs Villas, Queensbury, on or before Nov. 20, endorsed "Tender for House."

Nov. 20. Severn Tunnel.—*Construction of an engine-shed* and other works at Severn Tunnel Junction for the Great Western Railway Co. Plans and specification may be seen and forms of tender and bills of quantities obtained at the office of the engineer at Newport Station, between 10 a.m. and 4 p.m. Tenders, addressed to G. K. Mills, secretary, Paddington Station, London, and marked outside "Tender for Engine-Shed, Severn Tunnel Junction," will be received on or before Nov. 20.

Nov. 20. Bunchrew.—*Additions and alterations* to Kirkton Public School, Bunchrew. Plans and specifications to be seen with T. Munro, architect, 62, Academy Street, Inverness. Offers are to be lodged with S. Macdonald, Commercial Bank, Beauly, by Nov. 20.

Nov. 20. London, E.—*Erection of an additional furnace* in connection with the dust-screening apparatus at Marian Square, for the Council of the Metropolitan Borough of Bethnal Green. Plans and specifications can be seen, and form of tender obtained, upon application to the Borough Engineer and Surveyor at the Town Hall, Church Row, Bethnal Green, any day between the hours of 10 a.m. and 4 p.m. Fair wages clause. Tenders, sealed and endorsed "Furnace," must be delivered to R. Voss, town clerk, Town Hall, Bethnal Green, E., not later than 12 noon on Nov. 20.

Nov. 20. Cleveleys.—*Erection of new public elementary school* at Cleveleys (near Fleetwood) to accommodate 300 scholars, for the Lanchashire Education Committee. The plans may be seen and bills of quantities obtained at the offices of H. Littler, county architect, 16, Ribblesdale Place, Preston, by payment of a deposit of £2. Tenders must be delivered before 12 o'clock noon on Nov. 20, sealed and endorsed, to H. Stonestreet, Education Offices, Blakiston Street West, Fleetwood.

Nov. 20. East Ham, E.—*Erection of school buildings* to accommodate 852 children, at Storey Street, North Woolwich, and for the construction of deep foundations. Each contractor must deposit a £50 Bank of England note, or crossed cheque of equal value, with his tender. Plans and specification may be seen, and forms of tender and any other information obtained, at the office of the committee's architect, R. L. Curtis, 11 and 12, Finsbury Square, London, E.C., on any weekday except Saturday between the hours of 10 and 5. Tenders on the printed form must be delivered to H. C. Padgett, secretary, Education Office, East Ham, E., not later than 4 p.m. on Nov. 20. Fair wages clause.

Nov. 20. London, S.E.—*Erection of a mortuary*, Coroner's Court, and other buildings on a site in Baildon Street and Watson Street, Deptford, according to the drawings and specifications prepared by H. T. Bonner, A.R.I.B.A., to be seen at the Town Clerk's office, Town Hall, New Cross Road, between 10 and 4 o'clock, Saturdays between 10 and 1. Bills of quantities prepared by A. Crocker, together with the conditions of contract, may be obtained from V. Orchard, town clerk, Town Hall, New Cross Road, S.E., on payment of £2 2s. Persons desirous of tendering must send in their names to the Town Clerk on or before Nov. 17. Tenders, sealed and endorsed "Mortuary and Coroner's Court," must be delivered to the Town Clerk in accordance with the Council's regulations as to the receipt of tenders, at the Town Hall not later than 4 p.m. on Nov. 20. Fair wages clause.

Nov. 21. Liskeard.—*Erection of a new secondary school* at Liskeard. Plans and specifications may be seen at the office of J. Saneom, Architect to the Committee, Liskeard, from whom all particulars relating to the work may be obtained. Sealed endorsed tenders, on official forms, which may be had from the architect, are to be sent to F. R. Pascoe, secretary, Education Office, Truro, on or before Nov. 21.

Nov. 21. Gorphwysfa.—*Alterations to Gorphwysfa Chapel*, erection of new vestry with class-rooms above, and chapel house at Skewen, for the Building Committee. Plans and specifications may be seen and bills of quantities obtained at the offices of J. Cook Rees, architect, Neath. Sealed tenders to be sent to E. L. Davies, 10, Bethlehem Road, Skewen, on or before Nov. 21, endorsed "Tender for Alterations and Extensions."

Nov. 21. Thirsk. — *Proposed alterations to Thirsk Infants' Council School* for the Education Committee. Contractors desirous of submitting an estimate for the whole of the several works in connection with this may obtain forms of tender and inspect plans and specification at the office of C. Moore, Millgate, Thirsk, or at the County Hall, Northallerton, during ordinary office hours. Tenders to be delivered to D. Smith, secretary, County Hall, Northallerton, not later than Nov. 21, sealed and endorsed "Tender for Alterations, Thirsk Infants' School."

Nov. 21. Newcastle-upon-Tyne.—*Erection of new slaughter houses* at the Cattle Market, Scotswood Road, for the Finance Committee of the Corporation. Plans and specification may be seen, and bills of quantities and form of tender obtained at the City Property Surveyor's Department, Town Hall, on payment of £2 2s. to the City Treasurer. The successful contractor will be required to find two good and sufficient sureties, to be approved of by the Corporation, or, in lieu of finding such sureties, deposit with the Corporation a sum to be fixed by the committee, as security for the due and complete fulfilment of the contract. Sealed tenders, addressed to the "Chairman of the Markets Committee," and endorsed "Tender for New Slaughter Houses, Cattle Market," must be delivered at the Committee Clerk's Office, Town Hall, before 10 a.m. on Nov. 21.

Nov. 22.—Priestwood. — *Building of a new school* for 200 scholars at Priestwood, Easthampstead, near Bracknell, Berks Builders desirous of tendering are required to send in their names to the Secretary of the Education Committee, The Forbury, Reading, together with a deposit of £3 3s., for bills of quantities. Plans, specification, and form of contract will be open for inspection at the Education Secretary's office between the hours of 10 and 5. Tenders must be delivered at the office of the Education Secretary, on the form and in the envelope provided, not later than the first post on Nov. 22.

Nov. 22. Ackworth.—*Erection of working-men's club* institute and baths, at Ackworth. Plans and specification can be inspected, all information obtained, and assistance rendered on application to J. Heseltine, architect and surveyor, Pontefract. Sealed tenders delivered to him not later than noon on Nov. 22.

Nov. 23. Newry.—*Erection of fences* at each of the twelve houses at present being erected in the Rural District for the Newry No. 1 R.D.C. Persons tendering to quote at per Irish perch. Tenders to be lodged with W. R Bell, clerk of the Council, Clerk's Office, Council Chamber, Newry, not later than 5 p.m on Nov. 23. Specification can be seen at the Clerk's office.

Nov. 23. Aldborough.—*Erection of Aldborough proposed new school.* Builders desirous of tendering should send in their names not later than Nov. 5, to C. J. Brown, architect, Cathedral Close, Norwich, at whose office plans and specifications can be inspected and bills of quantities obtained. A deposit of £1 1s. will be required. Tenders must be delivered by 12 noon on Nov. 23, addressed to "The Secretary, Norfolk Education Committee, 57, London Street, Norwich," and endorsed "Tender for Aldborough School."

Nov. 24. Hyde.—*Erection of the Leigh Street Council School* to accommodate 1,200 children. Plans and specifications may be seen at the office of J. Lindley, architect, Town Hall Chambers, Hyde. Bills of quantities, forms of tender, &c., may be obtained from S. Ashford, secretary, Education Offices, Hyde, on a deposit of £3 3s. Sealed tenders, on the official forms and enclosed in the envelopes provided, must be delivered to the Secretary not later than Nov. 24. Fair wages clause.

Nov. 24. Barnwood.—*Erection of a new block* to accommodate about 170 female patients, at the Second County Asylum, Barnwood, near Gloucester. Bills of quantities and forms of tender can be obtained from Giles, Gough & Trollope, architects, 28, Craven Street, Charing Cross, London, W.C., on payment of £3 3s. Plans and specifications can be seen at the architects' office, 28, Craven Street, aforesaid, and at Wotton Asylum Gloucester. Sealed tenders, on forms supplied, are to be delivered to J. Thompson, clerk to the visitors, Wotton Asylum, Gloucester, on or before Nov. 24.

Nov. 27. Fulwood.—*Erection of a new public elementary school*, to accommodate 162 children, at Fulwood, near Preston, for the Lancashire Education Committee. The plans may be seen and bills of quantities obtained at the office of H. Littler, county architect, 16, Ribblesdale Place, Preston, by payment of a deposit of £2. Tenders must be delivered before twelve o'clock noon on Nov. 27, sealed and endorsed, to J. W. Lloyd, 4, Lune Street, Preston.

Nov. 27. Huncoat.—*Erection of a new public elementary school* to accommodate 300 children at Huncoat, near Accrington, for the Lancashire Education Committee. The plans may be seen and bills of quantities obtained at the office of H. Littler, county architect, 16, Ribblesdale Place, Preston, by payment of a deposit of £2. Tenders must be delivered before 12 o'clock noon on Nov. 27, sealed and endorsed, to F. Shutt, Council Offices, Mill Street, Padiham.

Nov. 28. Glanyrafonddu, near Tally.—*Erection of stone and steel bridge* at Glanyrafonddu, near Tally, Llandilo, for the Carmarthenshire C.C. Plans may be seen, at and copies of specification and quantities obtained from, the offices of C. H. Mounsey, county engineer and surveyor, County Surveyor's Offices, Carmarthen, on and after Nov. 7. Sealed tenders are to be in the hands of J. W. Nicholas, clerk of the C.C., Shire Hall, Carmarthen, on or before Nov. 28.

Nov. 29. London, W.C.—*Construction of an underground convenience* for men and women in Theobald's Road, and for additions to the existing underground convenience in Shaftesbury Avenue, in accordance with drawings and specification prepared by the Borough Surveyor for the Metropolitan Borough of Holborn. The drawings and specification may be seen at the office of the Borough Surveyor any day between the hours of 11 and 1, and quantities will be provided free of charge on application to Gardener & Theobald, 110, Great Russell Street. Tenders are to be in one sum for the whole of the works at the two conveniences, and persons tendering are requested to give the two amounts on their tenders, showing how the total tender is arrived at, accompanied with £20 in Bank of England notes. No tenders will be received that are not accompanied by such bank notes. Tenders are to be delivered to L. Walford, town clerk, Council Offices, 197, High Holborn, W.C., not later than 10 a.m. on Nov. 29.

Dec. 1. Roscrea, Co. Tipperary.—*Erection of a new bacon factory* at Roscrea, Co. Tipperary, for the directors of the Roscrea Bacon Factory, Ltd. (1) Excavations, foundation, concrete floors and walls. (2) Corrugated iron buildings or alternatively buildings with Belfast felt roofing. Plans, specifications, and forms of tender may be obtained on payment of a deposit of 40s. Tenders to be submitted by Dec. 1.

Dec. 12. Leigh-on-Sea.—*Erection of a new school* at Leigh-on-Sea, to accommodate 250 children. The tender accepted will be subject to the approval of the Essex C.C. and the Local Government Board. Contractors desirous of tendering are required to communicate with S. I. Adams, M.R.S.I., architect and surveyor, at Weston Chambers, Weston Road, Southend-on-Sea, not later than noon of Nov. 15, and to enclose cheque for £2 2s. The contractor whose tender is accepted will be required to provide a guarantee bond for an approved sum. Plans, &c., may be seen at the offices of the architect. Tenders, sealed and endorsed "Tender for Leigh School," are to be delivered to J. F. Ingram, secretary, Bank Chambers, Weston Road, Southend-on-Sea, by noon of Dec. 12.

Dec. 15. Woodford.—*Erection and completion of a new boys' school* to accommodate about 500 pupils, and for sundry alterations to the girls' and infants' schools at Churchfields, Woodford, Essex, for the Essex Educational Committee. Plans, specification, and form of contract may be inspected at the office of the architects, F. Whitmore, Chelmsford, and A. Hogwood, 33, Great Tower Street, E.C., between the hours of 10 and 5 on any working day, except Saturdays. Builders desirous of tendering must send in their names and addresses on or before Nov. 26, to E. J. Bond, clerk, Woodford Green, Essex, and 95, Leadenhall Street, London, E.C., with a deposit of £5, in return for which a copy of the bill of quantities and form of tender will be sent. The contractor will be required to give the bond of an approved guarantee society or some other approved security in the sum of £1,000, as security for the due performance of contract. Any tender accepted will be subject to the approval of the Essex C.C. and the Local Government Board. Sealed tenders, endorsed "Tenders for Woodford Churchfields Council School," must reach the Clerk not later than Dec. 15.

Dec. 22. Burnley.—*Erection of the proposed technical school* in Ormerod Road, Burnley. Drawings may be seen and specifications, bills of quantities, and forms of tender obtained at the office of the Borough Engineer, G. H. Pickles, A.M.I.C.E., on payment of £1 1s. Tenders, endorsed "Tender for Technical School," and addressed to the Chairman of the Education Committee, must be delivered at the Town Clerk's Office, Town Hall, not later than 9 a.m. on Dec. 22.

No Date. Great Houghton.—*Erection of new Wesleyan Church* and schools at Great Houghton, near Barnsley. Contractors desirous of tendering are requested to forward their names to Garside & Pennington, architects, Pontefract and Castleford, when bills of quantities and other particulars can be obtained, and will be forwarded.

ENGINEERING.

Nov. 15. Shinfield.—*Supply and laying* of about 1,776 lineal yds. of 6-in. cast-iron water-main, and about 3,666yds. of 4-in. ditto, including the supply and fixing in position of sluice valves, hydrants, bends, branches, surface boxes, &c., required in connection therewith in the Shinfield Road and Church Lane, in the parish of Shinfield, for the Wokingham R.D.C. Plans may be seen, and specification, &c., obtained of J. F. Sargeant, clerk, 8, Shute End, Wokingham, on payment of £1. Tenders to be sent to J. F. Sargeant, and endorsed "Tender for Laying Water-Mains," not later than Nov. 15.

Nov. 16. Rotherham.—*Heating the wards* and supplying domestic hot water to the wards, at the new Isolation Hospital, Badsley Moor Lane, Rotherham; and also for an extension of the heating apparatus at the Administrative Block at such hospital, for the Corporation. Further particulars and information can be obtained on application at the offices of J Platts, Corporation architect, High Street, Rotherham. Fair wages clause. Tenders, endorsed "Heating Isolation Hospital," to be sent to W. J. Board, town clerk, Town Hall, Rotherham, not later than Nov. 16.

Nov. 17. Tottenham, N.—*Heating the Parkhurst Road* and Belmont Road Schools with low pressure hot-water, for the Tottenham Education Committee. Applications for copies of specifications and quantities to be made to G. E. T. Laurence, A.R.I.B.A., architect, 22, Buckingham Street, Adelphi, W.C., before Nov. 17. Applications to be accompanied by a deposit of £2 2s. in respect of each school Fair wages clause.

Nov. 19. Basford.—*Making, delivering and fixing* a Lancashire boiler, 24ft. long and 7ft. diameter, together with injector, valves, &c., at the Basford Workhouse. Engineers desirous of tendering should apply to W. V. Betts, architect, Bank Offices, Old Basford, Nottingham, on or before Nov. 19, when specifications will be supplied to them.

Nov. 21. Lossiemouth.—*Supplying and erecting* over the river Lossie, at Lossiemouth, a foot-bridge 186ft, long, consisting of timber gangways and piers, and steel girders over three spans of 34ft., the west span having a tilting bascule. Plans and specification to be seen with, and schedules of quantities obtained from, G. Gordon & Co., civil engineers, Inverness. Tenders to be lodged on or before Nov. 21 with J. H. Glennie, town clerk, Lossiemouth, with whom copies of the plans and specification may also be seen.

Nov. 21. Hartlepool.—*Steel girder work* required for the New Coaling Staiths at Victoria Dock, Hartlepool, for the Directors of the North-Eastern Railway. Plans may be seen and specification obtained on personal application to T, M. Newell, Dock Engineer's Office, Hull. Sealed tenders, endorsed "Tender for Steel Girder Work, Hartlepool," to be delivered at the Secretary's Office, York, not later than 12 noon on Nov. 21.

Nov. 26. Alexandria.—*Three new boilers* for Atfeh Pumping Station. Tenders will be received at the office of the Inspector of Irrigation, 3rd Circle, Alexandria, up to 11 a.m. on Nov. 26. The boilers must be of some well-known type such as Galloway, Lancashire, &c., about 24ft. long by 6ft. 6ins. diameter, and will be required to generate about 150 h.p. each with a steam pressure of about 120lbs. Details should be given of length, diameter, plates, heating surface, riveting, steam pressure, tubes, &c., &c. The date by which they could be delivered in Alexandria should also be stated. Persons wishing to tender for this work and requiring further information should apply to the Inspector of Irrigation, 3rd Circle, Alexandria.

Dec. 1. Dorking.—*Providing and erecting a house refuse destructor* capable of dealing with 60 tons weekly. The U.D.C. invite firms to submit quotations, plans, and full details. Separate prices are desired for—(1) Machinery, including steam raising plant; (2) without steam-raising plant; and (3) building and roadway. Particulars as to site, &c., can be obtained on application to W. J. Hodge, clerk, 64, South Street, Dorking. Tenders, &c., marked outside "Destructor," to be deposited with him not later than Dec. 1.

Dec. 2. Melilla.—*Execution of the Port Works* at Melilla and Chafarinas. Tenders will be opened on Dec. 2 at the offices of the Port Works Board, Melilla, where plans, &c., may be inspected; these are also on view at the Ministry of "Fomento," Madrid.

Dec. 12. Belgium.— *Construction of the section* from Comblain-la-Tour to Ferrières of the Comblain-la Tour—Manhay—Melreux local railway. The estimated cost of the work is 445,260fr. (£17,810), and a deposit of 44,000fr. (£1,760) is required to qualify any tender. Tenders by registered letter will be received at the offices of the "Société national des chemins de fer Vicinaux," 14, Rue de la Science, Brussels, not later than Dec. 11. A copy of the specifications may be obtained on payment of 1fr. from M. L'Hoir, rue Edouard-Wacken, No. 10, Liége. Tenders will be opened on Dec. 12.

IRON AND STEEL.

Nov. 19. London, N.—*Supply and delivery of galvanised wrought-iron shingle bins* and cast-iron orderly bins for the Metropolitan Borough of Islington. A specification and drawing of the shingle bins and a specification and sample of the orderly bins may be seen, and a form of tender obtained, upon application to the Borough Engineer, J. Patten Barber, at the Town Hall, Upper Street, N., and payment of £1 1s. Sealed tenders, endorsed "Tender for Bins," must be received by W. F. Dewey, town clerk, Town Hall, Upper Street, N., not later than 4 p.m. on Nov. 19.

Dec. 31. Johannesburg.—*Supply and delivery* at the Central Fire Station, Johannesburg, of a turntable ladder, for the Johannesburg Municipality. Form of tender and specification may be obtained on application to the Council's agents in London, E. W. Carling & Co., St. Dunstan's Buildings, St. Dunstan's Hill, E.C. Sealed tenders, endorsed "Tender for Turntable Ladder." and addressed to the Town Clerk, Municipal Offices, Plein Square, Johannesburg, will be received by him not later than 12 noon, Dec. 31. The London agents will be pleased to furnish any information regarding the cost of delivery to tenderers on application.

PAINTING AND PLUMBING.

Nov. 15. Manchester.—*Painting the museum* and art gallery at Queen's Park for the Art Gallery Committee. Specifications may be obtained on application to the City Architect, Town Hall, Manchester. Sealed tenders, enclosed in the official envelope, to be delivered at the above office not later than 9 a.m. Nov. 15.

Nov. 16. Manchester.—*Painting the interior* of a warehouse, 57, Dickinson Street, for the Electricity Committee. Specification may be seen at the office of the City Architect, Town Hall. Sealed tenders, enclosed in the official envelope, must be delivered at the above office not later than 9 a.m. on Nov. 16.

ROADS AND CARTAGE.

Nov. 16. Bexhill.—*Supply of 412 tons* of the best imperial blue quartzite macadam. Forms of tender may be obtained on application to G. Ball, A.M.I.C.E., borough surveyor, Town Hall. Tenders to be sent in to T. E. Rogers, town clerk, Town Hall, Bexhill, not later than Nov. 16.

Nov. 17. Tottenham, N.—*Tar-paving and wood block flooring* for the Parkhurst Road and Belmont Road Schools, for the Tottenham Education Committee. Applications for copies of specifications to be made to G. E. T. Laurence, A.R.I.B.A., architect, 22, Buckingham Street, Adelphi, W.C., before Nov. 17. Fair wages clause.

Nov. 19. Plymouth.—*Making-up and completing*, under Section 150 of the Public Health Act, 1875, the following streets and lanes:—Bulmer Road, Sec. 2; Bulmer Road, Sec. 3; Knighton Road, Sec. 3; Westbourne Road Lane; Trelawney Road Lane East, No. 2. Tenders are invited for carrying out the works. Plans and specifications, and conditions upon which forms of tender will be granted, may be seen, and bills of quantities obtained, of J. Paton, borough engineer, Municipal Offices, Plymouth. Sealed tenders must be delivered at the said offices not later than 5 p.m. on Nov. 19.

Nov. 20. Wallasey.—*Supply of 150 tons of 5½ by 3¼ granite paving setts, and 150 tons of 4 by 4 by 4 setts*, for the U.D.C. Form of tender and further information may be obtained on application to W. H. Travers, engineer and surveyor, Public Offices, Egremont, Cheshire. Tenders in sealed envelopes, endorsed "Tender for setts," to reach H. W. Cook, clerk to the Council, Public Offices, Egremont, Cheshire, not later than Nov. 20.

Dec. 4. Ealing.—*Making up of various back alleys* on the Drayton Estate, West Ealing, for the Town Council. The drawings and specifications may be seen, and forms of tender, together with schedule of quantities and other particulars, obtained from C. Jones, M.I.C.E., borough engineer, Town Hall, Ealing, W., any day during office hours, upon payment of a deposit of £2 2s. Sealed tenders, in the envelopes provided, endorsed "Tender for Making-up ——," must be delivered to G. E. Brydges, town clerk, Town Clerk's Offices, Town Hall, Ealing, W., not later than 9.30 a.m. on Dec. 4.

Dec. 15. Maidstone.—*Supply of the following materials* to be delivered between April 1, 1907, and March 3, 1908, as follows:—72,000 tons (more or less) of broken stone and chippings, such as: 1. Rhenish basalt; 2. Guernsey granite; 3. Clee Hill basalt; 4. Leicestershire granites; 5. Penlee, St. Keverne, or other Cornish granites; 6. Penmaenmawr, or other North Wales granites; 7. Quartzite; 8. Norway granite; 9. Quenast; 10. Or other equally durable material. Also the following local materials: 3,000yds. (more or less) of Sevenoaks rock, unbroken; 16,000yds. (more or less) of surface-picked or grubbed flints; 2,500yds. of Kent rag, for the Bridges and Roads Committee of the Kent C.C. Specification and forms of tender can be obtained upon application to the County Surreyor, Maidstone. Sealed tenders, endorsed "Tender for Road Metalling." must be sent to W. B. Prosser, clerk to the Council, Sessions House, Maidstone (upon the prescribed form), not later than 12 noon on Dec. 15.

SANITARY.

Nov. 15. Conon.—*Construction of new drainage system* for the village of Conon. Plans and specification may be seen with, and copies of schedule obtained from, D. J. eid, civil engineer, York House, Church Street, Inverness, with whom offers are to be lodged on or before Nov. 15.

Nov. 17. Fulwood.—*Contract No. 6. Supply and laying of about 429 lin. yds.* of the best 12-in. earthenware socketted pipes, 166 lin. yds. being in tunnel and 263 lin. yds. in open cutting; also 51 lin. yds 9-in. E. S. pipes, together with manhole and ventilators, situate in Garstang Road and Highgate Avenue, Fulwood, for the U.D.C. Plans may be seen, and specification, bill of quantities obtained, on application to the engineer and surveyor, E. H. Naylor, Council Offices, Fulwood, upon payment of £1. Sealed tenders, on the form supplied, endorsed "Tender for Sewering," must be delivered to A. Brierley, clerk to the Council, Council Offices, Fulwood, Lancs, not later than Nov. 17.

Nov. 19. Penrith,—*Construction of sewage-disposal works* at Whinfell Holme, Penrith, and laying of stoneware and iron pipe sewers, for the U.D.C. General conditions, specifications, bills of quantities, and forms of tender may be obtained, and drawings inspected, at the Town Hall, upon receipt of a deposit of £5 5s. Full particulars may be obtained from Brierley, Holt, and Co., engineers, Blackburn and Blackpool, or from J. J. Knewstubb, resident engineer, Town Hall, Penrith. Sealed tenders, endorsed "Penrith Sewerage and Sewage Disposal Works—Contract No. 2," must be delivered to G. Wainwright, clerk of the Council, Town Hall, Penrith, not later than 12 noon, on Nov. 19.

Nov. 19. Southgate.—*Construction of a sewer* of a length of about 1,600yds. in and near to Green Dragon Lane, Winchmore Hill. Plans may be seen on application to C. G. Lawson, Council's surveyor, from whom copies of the specification and forms of tender may be obtained on depositing £2 in cash. Tenders, endorsed "Sewer," must reach W. M. Ellenor, clerk to the Council, Council Offices, Palmer's Green, N., not later than Nov. 19.

Nov. 20. Nuneaton.—*Construction of about 1,410 lineal yards* of 9-in. earthenware and cast iron-pipe sewers in Heath End Road, with the necessary manholes, flushing chambers, and other works apurtenant thereto, for the Nuneaton and Chilvers Coton U.D.C. Plans may be seen, and copies of specification, bill of quantities and form of tender obtained, on application to F. C. Cook, engineer and surveyor, Council Offices, Nuneaton, on deposit of the sum of £2 2s. Tenders, endorsed "Tender for Heath End Road Sewers," must be delivered to the Engineer and Surveyor not later than 12 noon on Nov. 20.

Nov. 22. Winchcomb.—*Construction of about 5,070 yards of stoneware pipe sewers*, together with sewerage disposal works, including liquefying tank, bacteria beds, and other works at the Cleeve Hill Sewerage, in accordance with the plans, detail drawings, and specification prepared by the engineer. Plans and specification may be seen, and form of tender and bills of quantities obtained, of J. Villar, engineer, 5, Essex Place, Cheltenham, on payment of a deposit of £3 3s. Sealed tenders, on form supplied, and endorsed "Cleeve Hill Sewerage," must be delivered to H. W. Stevens, clerk to the Council, Winchcomb, not later than 12 noon on Nov. 22.

Dec. 4. London.—*Supply of 23,800 tons of lime* to the Barking and Crossness main drainage outfall works, for the County of London. Tenders, which must be upon the printed form to be obtained upon application to the Council's chief engineer, at the County Hall, London, S.W., must reach the Clerk of the Council not later than 10 a.m. on Dec. 4, must be marked "Tender for Lime," Full particulars of the Council's requirements as to this and other tenders are published in the "London County Council Gazette," which can be obtained from King & Son, 2 and 4, Great Smith Street, S.W., price 1½d. an issue, or, for the year, a prepaid subscription of 6s. 6d.

MISCELLANEOUS.

Nov. 17. London, E.C.—*Supply of materials and stores*, including wrought iron and steel, rivets, bolts, nuts, &c., nails, spikes and ironmongery, paints and varnishes, oils, &c., Portland cement, for the Conservators of the River Thames, to be delivered as required at the Conservancy Works, Port of London Wharf, Millwall; Strand-on-the-Green, Chiswick; Shepperton Lock, Shepperton, Middlesex; Caver ham Yard, Reading; or Osney Yard, Oxford. Specification and forms of tender may be obtained at the Conservators' Offices, Victoria Embankment, E.C. Tenders must be sent in to R. Philipson, secretary, Thames Conservancy Offices, Victoria Embankment, London, E.C., not later than 10 a.m. on Nov. 17.

Nov. 19 Bristol.—*Supply during the year 1907* the following tools and stores:—*Castings, *ironmongery, cement, drain pipes, paints, *oils and candles, for the Sanitary and Improvement Committee of the Corporation. Specifications and forms of tender may be obtained at the offices of the City Engineer, 63, Queen Square, on payment of 10s. Local tenders only will be accepted for those marked *. Tenders must be sent in the envelopes provided to 63, Queen Square not later than 1 p.m. on Nov. 19.

Nov. 21. Dublin.—*Supply of the following stores* for 12 months to Dec. 31, 1907, for the Directors of the Great Southern and Western Railway (Ireland):—Castings, mall. iron, cement, files and tool steel, fishbolts (steel), galvanised roof sheets, buckets, &c., iron tubes and fittings, iron and steel wire, nails, railway fastenings (iron), rain-water pipes and gutters, sewer pipes, plaster of Paris, &c., varnishes. Forms of tender can be obtained on payment of 6d. each from the Company's storekeeper, at the General Stores, Inchicore, Dublin. Patterns may be inspected at the same place between 10 a.m. and 4 p.m. (except Saturdays). The tenders to be sent in, endorsed "Tender for Stores," and addressed to F. B. Ormsby, secretary, Kingsbridge Terminus, Dublin, so as to be with him before 10 a.m. on Nov. 21.

TOO LATE FOR CLASSIFICATION.

Nov. 15. Kendal.—*Erection of a residence* at Helsington Laithes, Kendal, for Mrs. Dixon. Plans may be seen and quantities and specifications obtained of J. F. Curwen, F.S.A,, F.R.I.B.A., architect and sanitary engineer, 26, Highgate, Kendal, up to Nov. 15, upon which date all tenders are to be sent (under cover) to him before noon.

Nov. 15. Sheffield.—*Extension of Nurses' Home.* Contractors wishing to tender for addition to the Nurses' Home at the Sheffield Union Hospital, Firvale, are requested to send their names to Potter & Sandford, architects, 16, St. James's Row, Sheffield, not later than Nov. 15.

Nov. 17. Saunderton.—*Alterations at the Union House* at Saunderton, for the Guardians of the Wycombe Union. Plan and specifications can be seen at the Union House on application to the Master. Tenders to be sent to B. L. Reynolds, clerk to the Guardians, 12, Easton Street, High Wycombe, on or before Nov. 17, endorsed "Tender for Alterations."

Nov. 19. Windermere.—*Erection of a villa residence* at Heathwaite, Windermere, for Miss M. Thirkell Cox. Plans and specifications may be seen at the office of J. Pattinson, architect, Windermere. Tenders to be sent in not later than Nov. 19.

Nov. 20. Hunslet.—*Alterations and additions* required at the Hunslet Union Offices, according to the plans and specifications prepared by the architect, W. E. Richardson, Rothwell, Leeds. Such plans and specifications may be seen, and bills of quantities and forms of tender obtained, on application to the architect. Tenders must be endorsed "Tender—Alterations," and be delivered to F. W. Mee, clerk to the Guardians, by 10 a.m. on Nov. 20.

Nov. 20. Salford.—*Sewering, paving, flagging,* and completing of five streets. The plans and specifications may be seen and forms of tender obtained at the Borough Engineer's Office, Town Hall, Salford. Tenders, endorsed "Street Paving," addressed to the Chairman of the Highway Committee, must be delivered to L. C. Evans, town clerk, Town Hall, Salford, not later than 10 a.m. on Nov. 20.

Nov. 21. Stanley, R.S.O.—*Erection of 12 dwelling houses* (stone) at Shield Row, Stanley, R.S.O., for S. D. Shafto, Esq., of Beamish Park, Beamish, R.S.O. Terms and specifications may be seen and particulars obtained on application to T. E. Crossling, architect and surveyor, Stanley, R.S.O., County Durham. Sealed tenders, endorsed "Twelve Houses, Shield Row," to be received not later than 6 p.m. on Nov. 21.

Nov. 22. Manchester.—*Painting and repairs* at various public underground lavatories and urinals. Specification and form of tender may be obtained on application at the City Surveyor's Office, Town Hall, Manchester, on payment to the City Treasurer of £1 1s. All cheques or postal orders to be made payable to the order of "The Corporatton of Manchester." Tenders, enclosed in the official envelope and addressed to the Chairman of the Sanitary Committee, to be delivered at the City Surveyor's Office not later than 10 a.m. on Nov. 22.

Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, *Great New Street, Fetter Lane, E.C.*

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Bagworth.—For the enlargement of Council school, together with out-offices, drainage and other works, for the Education Committee of the Leicestershire C.C. Mr. J. Frank J. Goodacre, architect, Berridge Street Chambers, Berridge Street, Leicester :—

W. Crane & Son, Ibstock	£1,617	12	0
S Chaplin, Stoke Golding	1,566	0	0
W. Corah & Son, Loughborough	1,565	0	0
E. Orton, Coalville	1,526	0	0
G. Toone & Sons, Anstey	1,459	16	0
A. Faulks, Loughborough	1,447	0	0
A. B. Moss, Coalville	1,414	7	0
T. Herbert, Leicester	1,386	0	0
W. H. Beck & Son, Market Bosworth	1,357	10	0
B. Shipman,* Ratby	1,351	9	0
Scurr, Jowett & Co.,† Barrow-on-Soar	1,266	0	0

* Accepted. † Withdrawn.

Barry.—For alterations and additions to High Street Old Boys' and Infants' Schools, for the Barry U.D.C. Mr. G. A. Birkenhead, architect, Caledonian Chambers, St. Mary Street, Cardiff, and 21, Park Avenue, Barry :—

G. Hallett, Cardiff	£7,820	0	0
A. Richards, Barry Dock	7,289	0	0
J. Allan & Sons, Cardiff	7,016	0	0
J. H. Maggs & Co., Cardiff	6,901	0	0
D. Davies, Cardiff	6,600	0	0
S. Shail, Llandaff	6,528	17	5
D. W. Davies, Cardiff	6,388	0	0
Lloyd & Tape, Barry Dock	6,313	0	0
W. Britton,* Barry Dock	6,308	0	0

* Accepted.

Bournemouth.—Accepted for the construction of sea-wall, undercliff drive, and other works in connection therewith, for the T.C. Mr. F. W. Lacey, M.I.C.E., borough engineer :—

S. W. Harrison & Co., 13, Temple Row, Birmingham	£16,900

Connah's Quay (Flints).—For the erection of proposed new infants' school, Golftyn, for the Flintshire Education Committee. Mr. S. Evans, county architect, Mold :—

J. T. Jones, Ruabon	£3,690	0	0
W. E. Peel, Connah's Quay	3,596	0	0
E. O. Probert, Hope Village	3,543	0	0
Davies Bros., Wrexham	3,537	11	0
R. Jones, Holywell	3,504	8	0
A. Emmott, Colwyn Bay	3,409	0	0
Hughes & Stirling, Bootle	3,395	10	11
J. Salt, Buxton	3,310	0	0
J. Bellis, Liscard	3,297	0	0
T. J. Reney, Connah's Quay	3,282	0	0
H. Smith, Kidderminster	3,195	0	0
J. H. Simmons, Wrexham	3,183	12	3
Dryland & Preston, Manchester	3,143	12	6
R. Evans, Colwyn Bay	3,134	0	0
G. Wright & Sons, Hawarden	3,108	0	0
R. Williams, Brymbo	3,076	0	0
G. L. Desoer, Liverpool	3,038	0	0
A. B. Lloyd, Flint	3,034	0	0
E. Blane, Connah's Quay	3,028	0	0
Wood & Co., Colwyn Bay	3,020	0	0
D. Gill & Son, Doncaster	2,994	5	7
M. S. Rogers, Flint	2,980	10	4
P. Williams, *Overton	2,913	0	0

* Accepted

Connah's Quay (Flints).—For the erection of proposed new infants' school in Custom House Lane, for the Flintshire Education Committee. Mr. S. Evans, county architect, Mold :—

J. Salt, Buxton	£4,300	0	0
E. Emmott, Colwyn Bay	4,275	0	0
Davies Bros., Wrexham	4,236	19	2
R. Jones, Holywell	4,186	7	0
J. T. Jones, Ruabon	4,176	0	0
E. O. Probert, Hope Village	4,111	15	0
Hughes & Stirling, Bootle	4,056	7	2
T. L. Davies, Rhos	3,997	4	11
R. Evans, Colwyn Bay	3,944	0	0
T. J. Reney, Connah's Quay	3,920	0	0
J. Bellis, Liscard	3,898	0	0
H. Smith, Kidderminster	3,887	0	0
A. B. Lloyd, Flint	3,850	0	0
Dryland & Preston, Manchester	3,815	0	4
G. L. Desoer, Liverpool	3,714	0	0
M. S. Rogers, Flint	3,710	0	0
Wood & Co., Colwyn Bay	3,706	0	0
G. Wright & Sons, Hawarden	3,695	0	0
E. Blane, Connah's Quay	3,579	0	0
R. Williams, Brymbo	3,573	15	10
P. Williams,* Overton	3,544	0	0
D. Gill & Son, Doncaster	3,517	0	0

* Accepted.

London, N.—For the erection of a new factory and connecting bridges at Wood Green, for Messrs. Barratt & Co. Mr. Fras. L. Pither, architect. Quantities by Messrs. Westmoreland & Horder :—

W. J. Edwards, Palmer's Green	£7,242	15	0
L. H. and R. Roberts, Islington	7,197	0	0
W. M. Bu chers, East Barnet	7,052	0	0
Allen & Sons, Kilburn	6,990	0	0
Ford & Walton, Kilburn	6,800	0	0
J. Carmichael,* Wandsworth	6,593	0	0

* Accepted.

London, N.—For the erection of a manual training centre to accommodate 40 boys, in connection with the Shap Street school, Haggerston, for the L.C.C. :—

Marchant & Hirst, 136, Highgate Road	£2,000	0	0
McCormick & Sons, Essex Road	1,899	0	0
Stevens & Sons, Seven Sisters' Road	1,798	0	0
Perry & Co., Bow	1,792	0	0
W. H. Lascelles & Co., Bunhill Row	1 769	19	8
W. M. Dabbs & Son, Clapton	1,706	0	0
G. Godson & Sons, Kilburn	1,704	0	0
J. Grover & Son, Islington	1,659	0	0
E. Lawrance & Sons, City Road	1,617	0	0
A. E. Symes,* Stratford	1,592	0	0

* Recommended for acceptance.
(Education architect's estimate, £1,778.)

London, S.W.—For alterations and extensions at the workhouse laundry, Swaffield Road, Wandsworth, for the Guardians :—

E. L. Ellis & Co., Balham	£3,004
H. King & Son, Peckham, S.E.	2,963
H. T. Bishop, Clapham Park	2,946
R. Ronald, sen., Wandsworth	2,860
S. E. Moss & Co., Southend-on-Sea	2,800
H. Dakin & Co., Putney	2,758
J. Shelbourne & Co., Wandsworth	2,690
Thames Electrical Joinery Co., Fulham	2,650
H. H. Hollingsworth, Peckham	2,642
R. A. Jewell, Wandsworth	2,624
Perry Bros., 21 Whitecross Street, E.C.	2,597
W. Wallis, Balham	2,590
A. Leather, Wandsworth, S.W.	2,590
F. Webster & Son, Peckham Rye	2,521
Myall & Upson, Ilford	2,500
J. Parsons, Waterloo Road, S.E.	2,493
F. & E. Davey, Southend on-Sea	2,479
Spencer, Santo, & Co., Kensington	2,470
E. Triggs, Clapham	2,428
B. E. Nightingale, Albert Embankment, S.W.	2,428
W. J. Renshaw, Putney	2,427
Fitch & Cox, Enfield	2,411
E. Wall, Tooting	2,410
F. & G. Foster, Norwood Junction	2,369
E. B. Tucker, Battersea	2,364
Hyde & Co.,* Clifford Road, Norwood Junction, S.E.	2,184

* Accepted.

Manchester.—For supplying and erecting boilers, mountings, &c., at the Royal Infirmary. Messrs. Edwin T. Hall, F.R.I.B.A., and John Brooke, A.R.I.B.A., architects :—

Galloways, Ltd.	£1,518
T. Beeley & Son	1,445
D. Adamson & Co.	1,435
Tinker, Shenton & Co.	1,431
J. Adamson & Co.	1,430
Yates & Thom	1,396
Tinkers, Ltd.	1,390
Oldham Boiler Co.	1,370
E. Heaton & Son	1,343
STEAM PIPES, PUMPS, &C.	
Tinkers, Ltd.	1,625
D. Adamson & Co.	1,298
Yates & Thom	1,297
Brightside Foundry Co.	1,255
Dargue, Griffiths & Co.	1,235

Ross.—For water supply, &c., at a new house near Ross, Herefordshire. Messrs. Groome & Bettington, architects and surveyors, Palace Chambers, Hereford. Quantities by architects :—

Smith & Watson, Ross	£126	0	0
E. W. Wilks, Hereford	109	0	0
J. C. M. Vaughan,* Hereford	105	1	9

* Accepted.

St. Helens.—Accepted for the erection of new schools at Parr, for the St. Helen's County Borough Council. Mr. Frank S. Biram, architect, Hardshaw Street, St. Helens :—

J. Rothwell & Sons, Knowsley Road	£15,330

Skewen (Neath).—For the erection of a Congregational chapel. Messrs. Lloyd & Martyn, architects, Dynevor Post Office, Skewen :—

D. Davies & Sons	£3,300
Price Brothers	2,861
D. Ogley,* Skewen, Neath	2,445

* Accepted subject to modifications.

Continued on page xx.

Guaranteed Door Springs.

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Electrical Notes.

Birmingham's New Power Station.

Like the London County Council, Birmingham is in a spending humour just now in the matter of electrical energy. Having brought its water from Wales at a cost of several millions, it has lately been turning its attention to the provision of municipal tramways and the extension on a great scale of its electric power and lighting department. This has necessitated the erection in Summer Lane of one of the biggest power stations in the Kingdom: it has cost £200,000. The entire scheme has been designed by the city electrical manager and engineer, Mr. R. A. Chattock, M.I.E.E. The new generating station was opened recently, and everything must be in order for the supply of electricity on January 1st next, when the whole of the tramways come into possession of the city. The new generating station comprises three large buildings, each 275ft. long—namely, the engine-house, the boiler-house, and the economiser-house, the largest of these being the engine-house, which is 100ft. wide. There are two chimney stacks, the larger being 230ft. high, with an inside diameter of 15ft. The engines have been built by the local firm of Messrs. Bellis and Morcom: each engine is of 3,000 h.p., the total power being about 20,000 h.p. In the boiler-house there is accommodation for 24 boilers, though at present only 10 are installed. The architects of the building (which is built of bricks, with terra-cotta dressings) were Messrs. Ewen Harper & Brother, of Birmingham. The building contract was carried out by Messrs. William Sapcote & Sons, of Birmingham.

"Commercial Electrical Assistants."

There seems to be a growing opportunity for the "commercial engineer"—the man possessing a fair degree of technical training and experience, combined with plenty of business push and ability. We have reached that stage, says the "Standard," where it is becoming recognised by those in authority that the selling of electricity, whether for lighting or power purposes, must be pushed with greater energy. But this cannot be done efficiently by the ordinary cânvasser or commercial traveller, for in calling upon the consumer many points of a more or less technical nature are sure to arise for his attention. Hence the need for the canvasser with a certain amount of electrical training. Good presence, attractive speech and abundant energy seem to be the main qualifications, but they cannot stand without a fair electrical knowledge. Several corporations and light and power companies have within the past year been making appointments such as those indicated—"commercial electrical assistants" being the correct title—and there is no doubt a great deal will be done in this direction in the future.

Improvements in the Accumulator.

In the course of a paper on "Recent Storage Battery Improvements," which he read before the Society of Engineers last week, Mr. Sherard Cowper-Coles, A.M.I.C.E., M.I.M.E., M.I.E.E., gave an historical sketch of the accumulator. He divided the cells under the following four heads:—(1) The solid cell, in which access to electrolyte is not provided for; (2) cells of the "multiple-unit" pasted-plate type, in which an attempt is made to deal with the electrolyte difficulty; (3) cells without plates of the solid network type, in which the solidity of the cell and access of active matter to electrolyte are both dealt with; (4) cells without plates of the solid network type, in which the electrodes consist of non-conducting networks covered with a film only of active matter. His conclusion was that immediate future developments would be in the direction of electrodes which contain the electrolyte within themselves.

The Age Limit.

There has been an increasing tendency, when advertising for engineers for municipal undertakings, to impose an age limit, says the "Electrical Engineer." The usual age is 40. Many councillors are imbued with the belief that all work and industry should be municipally controlled. Our contemporary, however, has little hesitation in stating that the majority of committeemen are totally unable to judge as to the fitness of an engineer for his post. Testimonials play far too great a part in their decisions, and the testimonials to which they pay most attention are not those which testify to a candidate's technical experience or to his commercial ability, but those from mere aldermen, councillors, chairmen of committees, *et hoc genus omne*. Moreover, only too often municipal appointments are decided neither by merit and ability nor by testimonials from protecting councillors, but by influence exerted by the friends and connections of a favoured candidate.

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NOTE.

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EDISWAN LAMPS.—In connection with the independent tests just concluded by the Westminster Electrical Testing Laboratory, York Street, Westminster, we understand that the "Royal Ediswan" Lamp comes out at the top of the list. The mean results of all the lamps tested show that this well-known lamp gives the best results under all headings, such as regularity of manufacture, life, and last, but not least, economy in watts per candle-power.

Tenders—continued from page xviii.

Surbiton.—For the construction of main drainage works, for the U.D.C. Mr. Nicholson Lailey, M.I.C.E., engineer, 53, Victoria Street, Westminster:—

W. Jones & Sons, Neath...	£70,400	0	0
Pethick Bros., Plymouth...	68,575	0	0
Pedrette Bros., Finsbury	62,479	13	7
C. B. Yewen, Croydon	61,822	16	6
Hay & Co., Westminster	60,570	10	0
E. Iles, Wimbledon ...	59,528	0	0
J. Dickson, St. Albans	57,527	18	11
Neal & Co., Plymouth	57,076	6	3
J. Riley, Cheltenham	56,373	19	9
J. Manders, Southampton	55,892	10	9
Moran & Co., Westminster	55,555	0	0
J. Jackson, Plaistow...	55,146	16	3
Stephens & Sons, Exeter	55,146	0	0
Cooke & Co., Battersea ...	55,129	0	0
W. H. Wheeler, Blackfriars ...	55,085	9	6
F. Osenton, Staines ...	£55,078	0	0
Wright & Co., Leicester ...	54,683	3	11
F. Osman, Southampton...	54,462	16	0
McAlpine & Sons, Glasgow	54,253	17	5
F. Trimm, Dorking ...	52,628	0	0
Johnson & Langley, Leicester	52,063	0	0
W. Cunliffe, Birmingham	51,295	0	0
Johnson Bros., Hereford	50,750	0	0
Braithwaite & Co., Leeds	49,913	11	6
S. Kavanagh,* Tolworth...	48,810	16	0
D. Jackson, Barking...	47,399	4	6
Smith & Co., Westminster	44,714	5	3

POWER STATION.

J. H. Allwork	1,386	17	0
Bull & Esdaile	1,386	0	0
Gaze & Sons ...	1,370	0	0
T. Johnson	1,311	18	4
F. Hawkey	1,309	0	0
McDonald Bros.*	1,293	11	0

COTTAGE.

J. H. Allwork	£413	17	0
Gaze & Sons	398	0	0
Bull & Esdaile	372	0	0
F. Hawkey ...	350	0	0
McDonald Bros....	330	0	0
T. Johnson *	319	8	10

* Accepted. [Rest of Surbiton.]

Woolwich.—For the erection of a new women's dining hall at the union house, High Street, Plumstead, for the Guardians. Mr. J. O. Cook, architect, 1A, Eleanor Road, Woolwich:—

E. Mills, Greenwich	£1,410
E. T. Selby, Leytonstone	1,405
W. F. Blay, Dartford	1,350
Friday & Long, Erith	1,340
W. Harris, North Woolwich	1,219
J. Lonsdale, Swanley Junction ...	1,212
J. Scott Fenn, Woolwich	1,167
Loasby & Salmon, Hither Green	1,167
E. Proctor, Plumstead ...	1,150
H. Sandford & Co., Woolwich ...	1,120
J. W. Jerram, East Ham	1,119
A. J. Ware, Plumstead ...	1,117
Thomas & Edge, Woolwich...	1,093
Crisp & Jones, Walthamstow	1,080
H. Kent, Hither Green ...	1,050
J. F. Shorters, Greenwich	1,046
Steadman & Co., Forest Gate	1,045
Pasterfield & King, Peckham	1,034
R. & E. Evans, Peckham	1,009
W. H. Hyde,* Norwood Junction	894

* Accepted.

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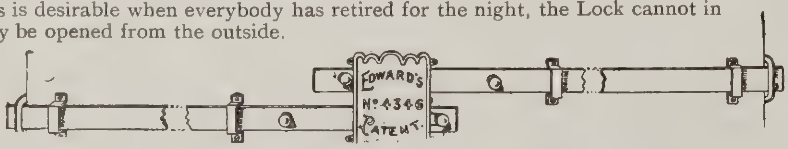

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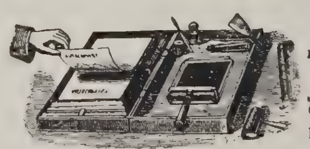

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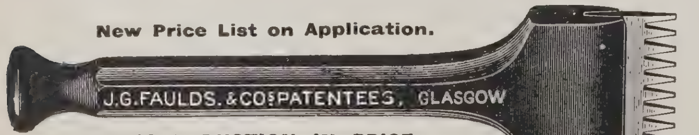

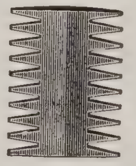

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Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—adjudication.]

During the week ending Nov. 9th twenty-six failures in the building trades in England and Wales were gazetted.

C. Gradden, builder, Sutton. R.O., Oct. 30.

W. J. Wyatt, builder, Gravesend. R.O., Nov. 1.

T. P. Williams, builder, Norton-on-Tees. R.O., Oct. 31.

Chapman & Son, plumbers, Uppingham. R.O., Nov. 2.

A. Cooper, contractor, Birmingham. R.O., Oct. 30.

J. Hadley, brick manufacturer, Rowley Regis. R.O., Nov. 1.

F. Whitehouse, builder and contractor, Ipswich. Adj., Oct. 31.

T. Horner, joiner and builder, New Cleethorpes. R.O., Oct. 30.

H. Burgess, builder, Ealing. Liabilities, £108; deficiency, £38.

S. Clarke, wallpaper, oil, colour and glass merchant, Swansea. Adj., Nov. 1.

J. H. Snelling, builder, Yarmouth. Liabilities, £4,165; estimated surplus, £1,106.

G. W. Baster, builder and contractor, Southsea. Gross liabilities, £1,018; deficiency, £645.

W. Beaton, builder, Portsmouth. P.E., Portsmouth C.C., Nov. 26, at 11. R.O., Oct. 30.

F. W. Applegate, brickmaker, Blickling and Baningham. P.E., Shire Hall, Norwich, Nov. 21, at 11. R.O., Oct 31.

W. Squires, architect, Leeds. Gross liabilities £50,765; £1,375 expected to rank; estimated surplus over liabilities, £1,535.

A. Hancock, painter and house decorator, Aberdare. P.E., Temperance Hall, Aberdare, Dec. 3, at 10.30. R.O., Oct. 29.

H. C. Goss, builder, Torquay. First meeting, O.R.'s, Exeter, Nov. 15, at 10.30. P.E., The Castle, Exeter, same day, at 11.30.

G. E. Moulds, joiner, Leeds. First meeting, O.R.'s, Leeds, Nov. 14, at 11. P.E., Leeds C.C., Nov. 27, at 11. R.O., Oct. 27.

W. Savage, engineer, King's Lynn. First meeting, C.C., King's Lynn, Nov. 15, at 10.15. P.E., same day at 11. Adj., Oct. 29.

T. May, contractor, Plymouth. First meeting, O.R.'s, Plymouth, Nov. 15, at 11. P.E., Town Hall, East Stonehouse, Nov. 27, at 12.

P. Mounter, builder, Brixton. First meeting, London Bankruptcy Court, Nov. 20, at 12. P.E., same, Dec. 21, at 11.30. R.O., Oct. 30.

Wilkinson Bros., builders, Palmers Green. First meeting, 14, Bedford Row, W.C., Nov. 15, at 12. P.E., Edmonton C.C., Dec. 3, at 11 30.

J. G. Moore & Co., contractors, West Hartlepool. First meeting, Bankruptcy Court, Nov. 19, at 2.30. P.E., same, Dec. 7, at 11.30. R.O., Oct. 30.

A. E. A. Bennett, builder, Bristol. First meeting, O.R.'s, Bristol, Nov. 14, at 12.15. P.E., Guildhall, Bristol, Nov. 30, at 12. R.O., Oct. 31.

H. G. Heywood, builder, Hammersmith. First meeting, London Bankruptcy Court, Nov. 14, at 2.30. P.E., same, Dec. 6, at 11.30. R.O., Nov. 2.

E. A. Sparksman, builder, Hammersmith. First meeting, London Bankruptcy Court, Nov. 14, at 2.30. P.E., same, Dec. 11, at 11.30. R.O., Nov. 2.

P. Walsh & Son, plumbers and sanitary engineers, Blackburn. First meeting, O.R.'s, Preston, Nov. 14, at 11.30. P.E., Blackburn C.C., Dec. 5, at 9.45.

W. J. White & Co., tile and brick merchants, London. First meeting, London Bankruptcy Court, Nov. 14, at 12. P.E., same, Dec. 4, at 11.30. R.O., Oct. 31.

Coming Events.

Wednesday, November 14.

Edinburgh Architectural Association.—Opening meeting, at 8 p.m. Presidential address by Mr. Hippolyte J. Blanc, R.S.A.

Thursday, November 15.

Chemical Society.—Meeting at Burlington House, at 8.30 p.m.

Society of Architects.—Opening Meeting. Presidential Address by Mr. A. E. Pridmore, at 8 p.m

Friday, November 16.

Glasgow Technical College Architectural Craftsmen's Society.—Discussion on "The Ideal Specification," at 8 p.m.

Institution of Mechanical Engineers.—Mr. T. Clarkson on "Steam as a Motive Power for Public Service Vehicles," at 8 p.m.

Incorporated Association of Municipal and County Engineers.—Mr. T. C. Horsfall on "The Planning and Control of Town Extensions in Germany," Institution of Civil Engineers, at 7 p.m.

Art Workers' Guild.—"The Architectural Treatment of Windows," Clifford's Inn Hall, at 8 p.m.

Wednesday, November 21.

Northern Architectural Association.—Presidential address by Mr. J. T. Cackett, F.R.I.B.A.

Thursday. November 22.

Architectural Association (Discussion Section).—Mr. H. G. Iberson on "Do Architects Justify their Existence?" at 7.30 p.m.

Builders' Benevolent Institution.—Banquet at the Hotel Metropole.

Educational.

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Tenders, endorsed "Tender for Technical School," and addressed to the Chairman of the Education Committee, must be delivered at the Town Clerk's Office, Town Hall, not later than 9 a.m. on Saturday, the 22nd day of December, 1906.

The lowest or any tender will not necessarily be accepted, and persons tendering must do so at their own expense.

E. JONES,
Clerk to the Education Committee.

Town Hall, Burnley,
November 6, 1906.

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By Order of the Board,
R. T. KINGHAM,
Secretary.

6, Finsbury Square, London,
October 24, 1906.

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SEE PAGES XXIII AND XXIV FOR EMPLOYMENT REGISTER.

THE BUILDERS' JOURNAL
AND ARCHITECTURAL ENGINEER.
November 14, 1906.
CONTRACTORS' SUPPLEMENT (MONTHLY).

CRANES FOR CONTRACTORS.

One of the London morning papers, reporting recently on the unemployment in some of the leading trades, mentioned an interview with a scaffolder, who attributed the want of employment to the "Scotchman." This did not refer to workmen from the north of the Tweed, but to the derrick cranes which are now so largely used in building operations, and which have so greatly saved the cost of scaffolding and reduced the amount of labour in the erection of high buildings.

These cranes are so largely employed now that they are a matter of general interest to contractors. In the earlier stages, when the size and height of buildings were more limited, these derrick cranes were at first mainly operated by

Hand Power

and the pioneers in this line of business were Messrs. Butters Bros., of Glasgow, which accounts for the name of "Scotchman" being given to this class of crane.

These cranes were cheaply constructed with post and back stays of timber and timber jib, and worked by spur wheel and pinion gearing, with a derricking motion by which the radius of the jib could be altered by raising the head of the jib, so that materials could be picked up with the jib at its full radius and lifted up on to the building, and deposited in the position in which they were required by reducing the radius of the jib. The construction of this type of crane made it very suitable for fixing on a scaffold and afforded an exceedingly cheap and simple method of raising the material, it being possible to fix the crane at any height to suit the character of the building.

They were made to take loads up to about 3 or 4 tons with jibs up to about 30ft. to 40ft.; when the length became increased steel jibs were added up to about 50ft.

As, however, the height and size of buildings increased and the quantity of material to be raised correspondingly increased, manual labour became too slow, and

Steam Power

was very largely used.

Steam derrick cranes were built to raise a load of 3 to 4 tons and the radius of the jib with this arrangement increased to 75ft. or even 100ft. long; the jibs in this case being strongly built of lattice steelwork, and the load being raised by means of winding gear with steam engine and boiler. An arrangement of this kind, of course, very greatly facilitated the handling of goods and saved a very great amount of time and labour.

These cranes are fixed on stagings consisting of three towers, the front supporting the weight of the crane itself and the two rear towers taking the stays to which the mast is tied back.

The disadvantage of this class of crane, of course, consists in the fact that with a steam boiler the whole of the machinery has to be hoisted up to the top of the structure, and the fuel for maintaining the steam also has to be hoisted up; and with a boiler working on a wooden structure there is always a certain amount of risk of fire.

The next step in the development was the employment of

Hydraulic Power

for operating cranes of this type, and large hydraulic cranes were fitted up which were worked from the mains of the London Hydraulic Power Company, to which connection was very easily made by means of iron piping; such cranes were built by the Hydraulic Engineering Company, of Chester, to raise a load of 25 cwts. or 3 tons with proportionate consumption of water. The jib was arranged to luff in or out between 50ft. maximum and 16ft. minimum rakes, and to slew through about three-quarters of a circle. The lifting and luffing cylinders were placed vertically in the structure below the crane mast and the slewing cylinders at the back of the mast. These cranes consume about 100 gallons per operation lifting the full load of 3 tons a height of 120ft.; 26 gallons for luffing in through the whole range, and 3½ gallons to slew three-quarters of a revolution. The controlling valves are placed in convenient position of the platform and operated by a separate lever, so that the motions can be made separately or together as may be required.

In the latest development, however, of this type of crane

Electric Power

is being very largely used, as the current is obtained very cheaply and the power can be laid with great convenience to the crane gear, which is all fixed on to the body of the crane itself. The great advantage of electrical power is that the power consumed is in proportion to the load actually lifted, and as these cranes, which are constructed to take heavy maximum loads, are very frequently used to raise quite light materials, the economy in working cost is very great.

An electric derrick-crane with a 75ft. steel jib would lift one ton 70ft. high 12 times for one unit of current.

An electric motor and gear are fixed at the foot of the mast; the motor is usually

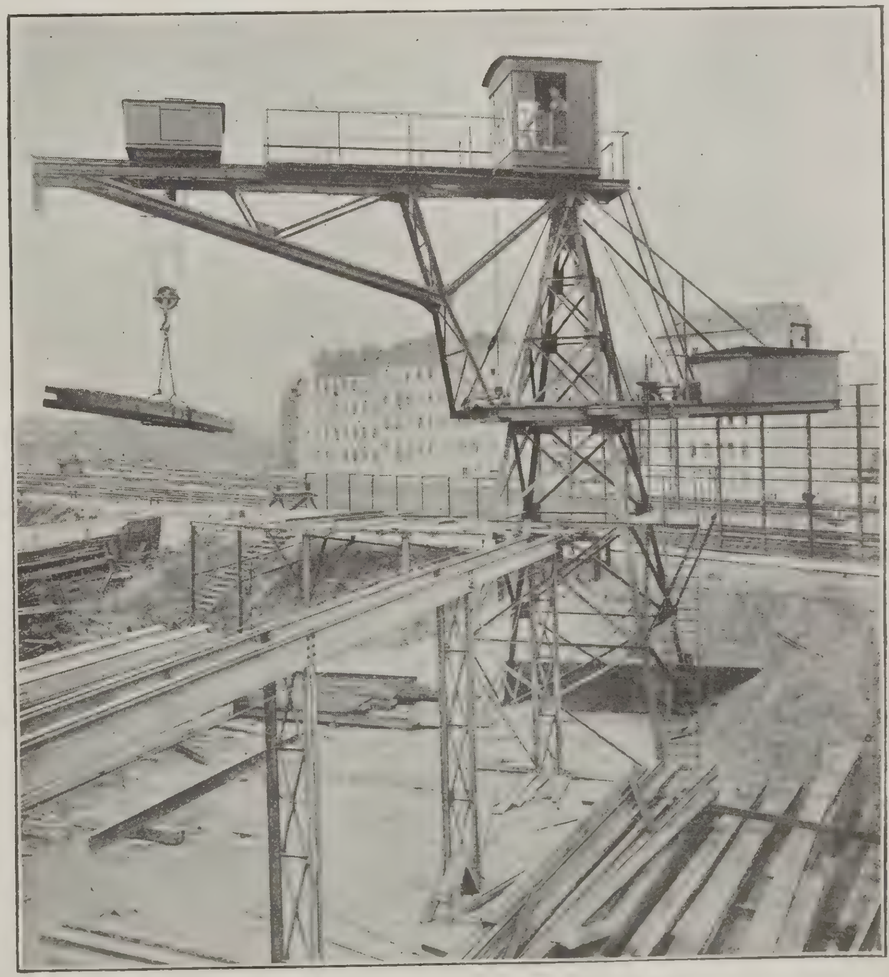

FIG. 1: A GERMAN ELECTRIC TURRET CRANE.

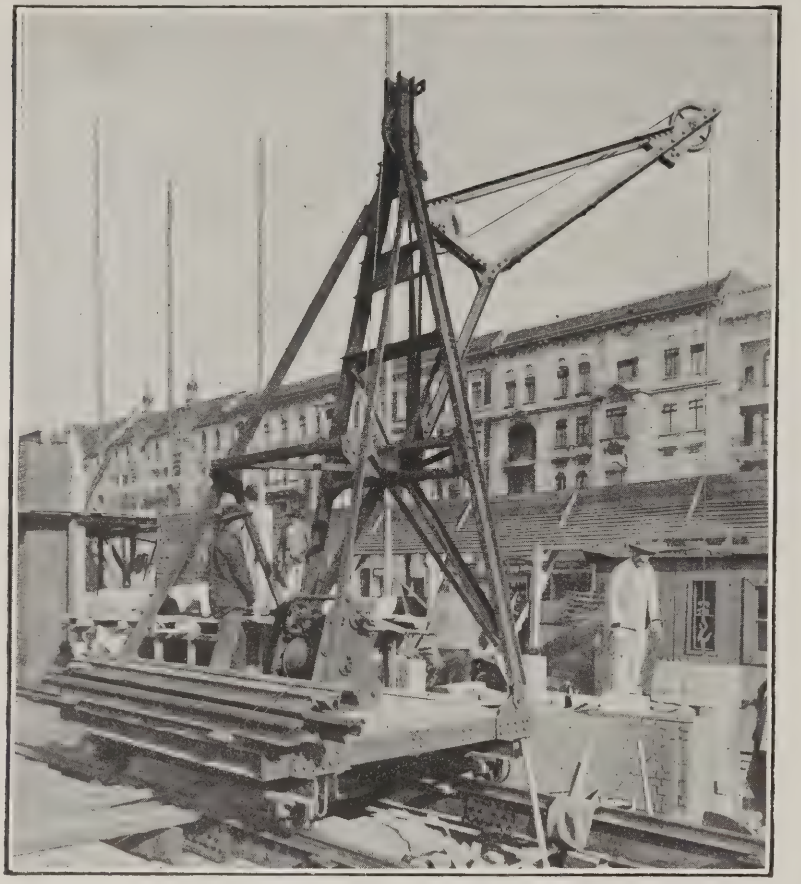

FIG. 2. GERMAN HAND-POWER CRANE.

series wound and completely enclosed, and drives through machine-cut spur gearing to lifting barrel, which is adapted for rope or chain, but wire rope is usually preferred as it runs more smoothly than a chain. Derricking gear is also attached to the mast and connected by steel wire rope to the head of jib. The crane can also be slewed to the right or left. The operation may be either by one motor for all movements or by separate motors for each movement, so that the lifting and slewing can be carried on simultaneously.

The crane is, of course, fitted with a powerful electric brake, and mechanical brake by which the load when lowering can be most exactly adjusted, so that blocks of stone or steel joists can be carefully placed in the exact position where required without shock or jerk.

Where required, electric cranes can easily be made to travel on rails, like those used in the widening of London Bridge. These cranes were designed to lift a maximum of 3 tons at a speed of 75ft. per minute, the radius of the jib being capable of luffing from 12ft. to 18ft. The cranes were also provided with travelling movement controlled by electric current. They could be slewed in either direction when stopping or reversing the motor.

The current is collected by shoes from copper conductors laid between the rails and conveyed to the motor through rubbing contacts.

For lighter work required on buildings, such as hoisting barrows of bricks and other materials,

electrically operated hoists

are also very conveniently arranged, and a very handy hoist of this description, Fig. 3, is constructed by Messrs. R. Waygood & Co., Ltd., of London, the hoist in this case being driven by motor connected through spur gearing to winding drum and controlled by reversing switch for driving in both directions. The lifting ropes can be led in any convenient direction by means of sheaves and the hoist can be moved to various positions as required, and may be mounted on wheeled carriage if desired. One of these hoists is in operation at the new London County Council Fire Station, which is being built in Watling Street.

In many large buildings cage hoists are now employed for raising bricks and other material (Fig. 4); these are frequently operated by

Friction Gear

as shown in Fig. 5. In this arrangement the load is raised by motor power and lowered by the brake, which is satisfactory for carrying goods, but if workmen are allowed to ride in the hoist, then a worm and wheel winding gear, as used for ordinary lifts, should be adopted, as with this form of gear the cage is driven down as well as up at a regulated speed, and cannot run down. With a lift of this kind carrying half a ton a height of 70ft., about twenty complete journeys up and down would be made with one unit of current, costing a penny or twopence, according to the local charges.

In many cases electrical power would hardly be economical in comparison with hand power for the hoisting of materials

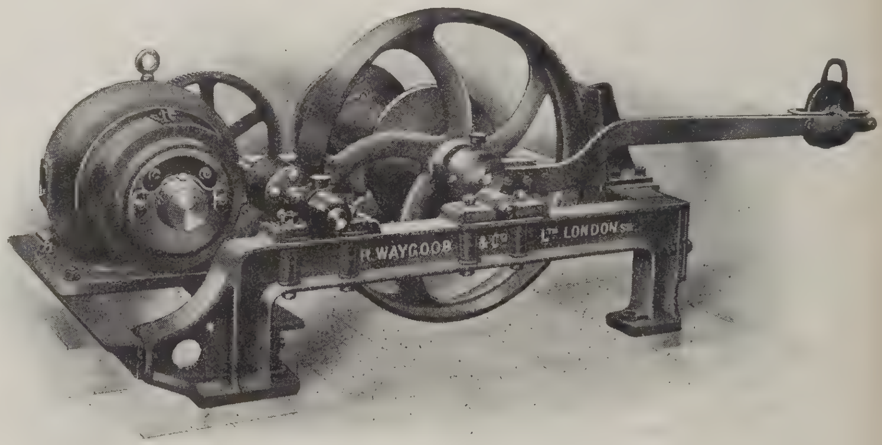

FIG. 5. FRICTION GEAR.

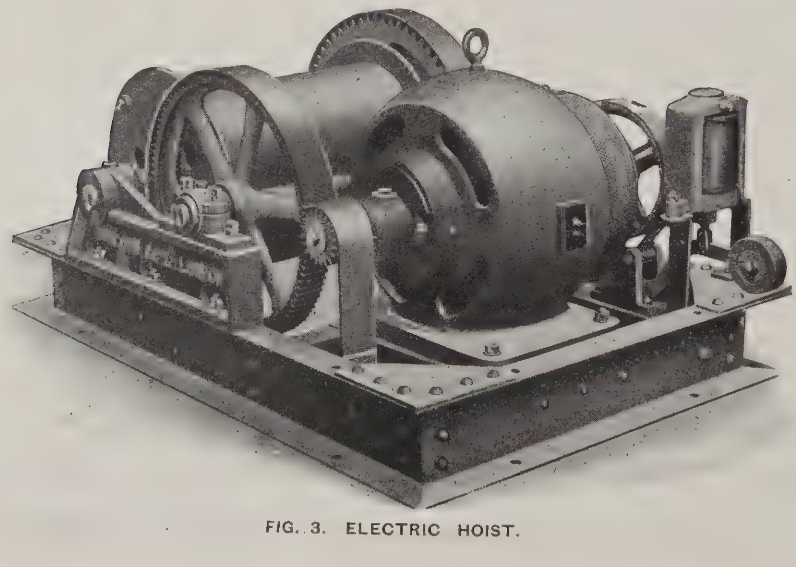

FIG. 3. ELECTRIC HOIST.

on jobs. We do not, however, refer to the old inefficient form of hand power consisting of hauling a rope over a pulley in order to raise a bucket or basket. The most up-to-date form is a patent winch, made by Messrs. G. Stacey & Co., of 66, Lorrimore Road, Walworth, London, S.E. This winch is fitted with two fenced and sprocketed wheels, and strong pitched chain, with 30in. heavy cast iron fly wheel and cased handle, and can be supplied with or without a brake, as required. The bearings of the driving spindle are made moveable, and can be adjusted by two set screw bolts, in the iron frame of the winch, for regulating the pitch chain. The winch only requires one man to work the gear attached to the drum, as shown in Fig. 6. This particular view relates to a job in Charles Street, Kensington, W.

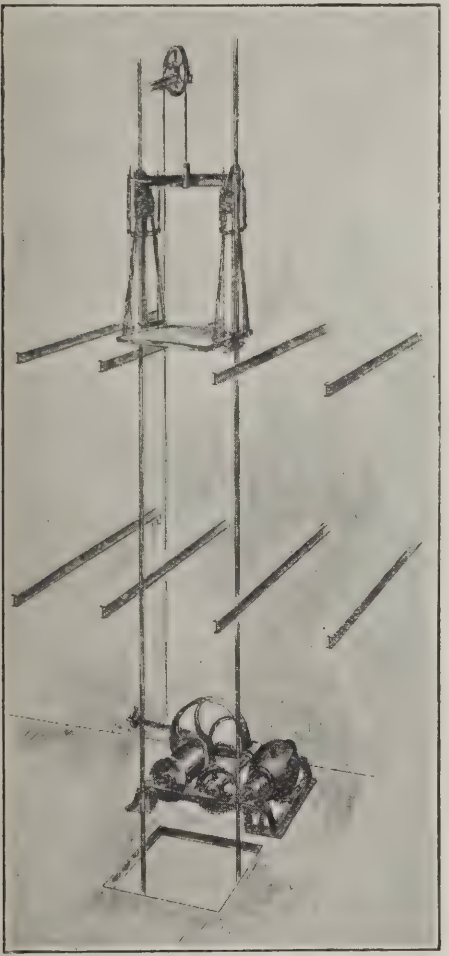

FIG. 4. AN ELECTRICALLY OPERATED CAGE HOIST FOR MATERIALS.

In our "Concrete and Steel" supplement for October 10th we published an article on a new printing works at Aylesbury, which was run up in a remarkably speedy way. The whole of the fireproof flooring and materials on that job were raised by Stacey's patent winch.

Overhead travellers are largely used in contractors' works and can be very economically operated by electric power, being made to lift and traverse by power, but these are not so convenient for use in building operations, and form a separate class by themselves.

In some cases endless hoists, consisting of a series of cages or platforms, suspended on pitch chains, are used for carrying materials from one level to another, where continuous delivery is required, and where a steam or other engine is running continuously on the building; but this arrangement is not economical unless in constant use, and as it can only deliver between fixed points loses many of the advantages of the electric hoist.

We also reproduce two illustrations (Figs. 1 and 2) showing contractors' cranes of two types which are frequently used in Germany. The hand-power crane can be moved along rails and the jib slewed round so as to place materials in a required position, but the jib is immovable vertically. The steel framework, it will be noticed, is designed simply so that it can be economically constructed. The electric crane can turn a complete circle and is provided with a travelling carriage, which runs along the jib, so that the loads can be easily and accurately deposited where required. The end of jib is supported from the staging by a powerful strut and is counterbalanced by a water tank. These cranes are made by Messrs. Carl Flohr, who have recently opened an office at 73a, Queen Victoria Street.

BRITISH TRADE WITH BELGIUM.

The following remarks with reference to the best methods of tendering for contracts and supplying British goods in Belgium, are extracted from the recent report of our Consul-General at Antwerp:—"I have on frequent occasions called attention to the absolute impartiality of the Belgian authorities in according the carrying out of public contracts to firms of any nationality, provided that the tender for the work or construction is sufficiently low to favourably compare with the offers of firms situated in this country. Of the considerable number of notices applying for tenders placed before the British manufacturing public by the Commercial Intelligence Branch of the Board of Trade, on only one occasion has it come to my knowledge that a British firm has competed for the work. . . . In view of the difficulties which have to be overcome in the carrying out of contracts in Belgium by British firms, it would be better, perhaps, for such firms to devote their attention to the companies of Belgian nationality who have been awarded the contract, and endeavour to supply them with the necessary material required in the execution of the works. For instance, most of the large towns in Belgium offer, from time to time, contracts for the supply and laying of paving stones for the streets and footpaths. There would, in such cases, appear to be an opening for British trade in the supplying of the stone or granite for the work, and the endeavour of British firms should be to get into touch with, and supply material to, local firms to which contracts have been awarded."

The New Edition of the "Canadian Trade Index" has just been issued by the Canadian Manufacturers' Association. This contains alphabetical and tabulated lists of many of the leading industrial enterprises in the Dominion. Copies can be obtained free from the Canadian Government, City Trade Branch, 73, Basinghall Street, London, E.C.

Manchester Plumbers' Lock-out. — The claim of the plumbers of Manchester and Salford for a reduction of working hours without a reduction of wages is being sternly resisted by the masters. The men have been practically "locked out" for some time, but as the winter has arrived the necessity for their being at work is emphasised. The masters' case is that the men are paid $8\frac{1}{2}$d. an hour, and that they cannot afford to pay more.

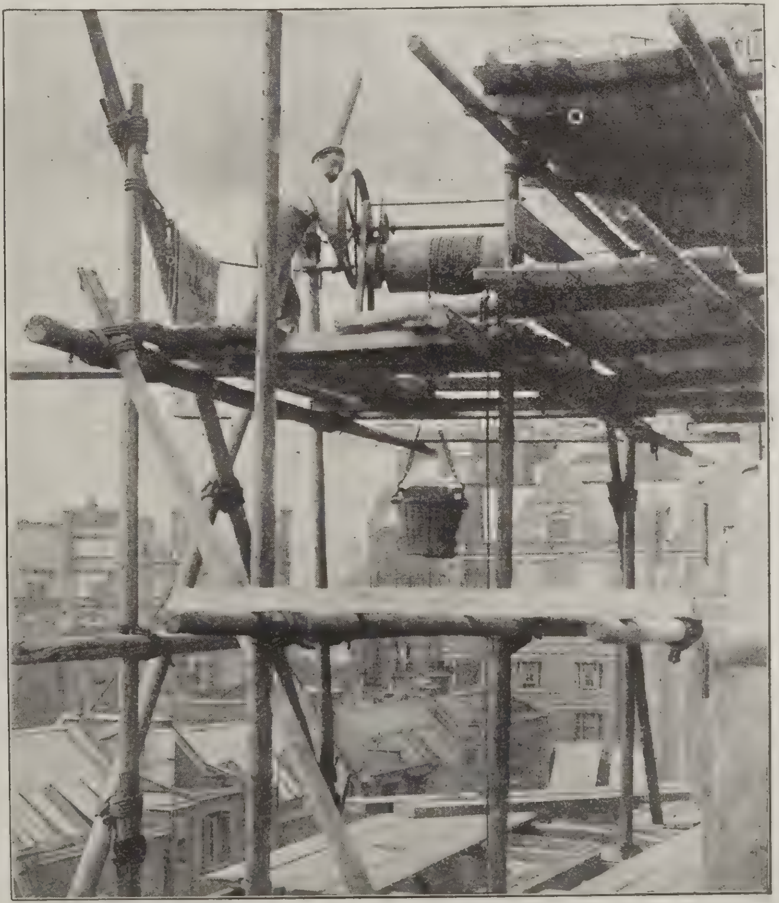

FIG. 6. STACEY'S HAND-POWER WINCH.

The Month's Trade

Reports by our Special Correspondents.

THE CLAYWORKING INDUSTRY.

In the brick and tile trades the improvement, we are glad to be able to report, continues. Some few places have fallen back, but not so materially when we consider the time of year; the retrograde movement will in all probability not continue for long. We are able to state that employment in the clayworking yards of Oldham and South Wales has continued good during the past month, and that it has been fairly good in Devonshire, Suffolk and Essex. This is, of course, only what would be expected in the general improvement of trade in these districts, which we have before referred to, and to this same reason may be traced the fact that the trade in this branch of the building industry has been fair in South Staffordshire, North Wales and the Tees district. At Bradford things have been somewhat slack, while, unfortunately, Nottingham and Peterborough have not yet awakened into life. Indeed, at both of these places trade is reported to have been worse than a month ago. Nothwithstanding the fact that large contracts have been secured in Birmingham, trade has continued bad there. However, the prospects are good, and early next year there should be a welcome revival.

THE STONE, GRANITE AND MARBLE TRADES.

Considering the time of year the state of trade in these branches is fair, and nothing has arisen to suggest that the improvement which has been noticeable in the past few months will not continue. The check is only a seasonable one, and, compared with a year ago, things are better.

In the limestone quarries in Cumberland, Weardale, and South Durham employment was good in the past month, and fair in North Wales and Buxton. Employment in the blue lias quarries in Somersetshire has been dull.

The sandstone quarries in North Wales have been fairly well employed. The Rowsley sandstone quarries have been moderately employed, with an improvement on previous months, and the Gateshead quarries have been moderately employed also. In the Bath stone quarries employment has continued dull, and in the Forest of Dean it was slack. The Pennant stone quarries in the Bristol district have been badly employed. At Barnsley the trade has been slack, and in Forfarshire it has continued bad.

Important stone quarry developments are being carried out at Springwell, a mining village some four miles south of Gateshead. A Northern stone firm has secured 900 acres of land, and much of it is said to contain a rich bed of stone. Five miles of railway are being laid in order to quarry the stone and convey it to the Pontop and Jarrow Railway, which is in close proximity. A powerful steam navvy has been erected, and will shortly be used to convey earth and clay from the surface of the rock. Some old houses, known as the Red Row, have been purchased, and will be pulled down in order that stone-dressing machines may be erected on the site. The whole of the machinery will be worked by an electric plant of 1,100 horse-power. The firm also intends to erect 300 dwelling houses on some waste land near the quarries.

As regards the granite trade, employment has been fair in Aberdeen, and an improvement has been shown on previous months, but trade is not so good as a year ago. In Leicestershire trade has been only fair. In North Wales it has continued good, and in Devon and Cornwall, although there is a slight improvement noticeable, employment has been very quiet.

In regard to settmaking, employment has been fair in Aberdeenshire, and good at Airdrie and Glasgow. At Aberdeenshire it has continued bad, and worse than a year ago. In North Wales employment was fairly good generally. The Cleehill road-making material quarries have been only fairly employed.

The returns for imports of stones, slabs and marble, rough, hewn and manufactured, for the month of October, as compared with the same month in 1904 and 1905, are as follows :—

Tons.			Value.		
1904.	1905.	1906.	1904.	1905.	1906.
117,578	92,590	95,282	£121,425	£105,080	£100,629

THE SLATE TRADE.

We are not yet able to report any advance in this branch of the building trades, which does not seem to have shared in the general improvement. In the North Wales quarries on the whole the slate trade has been stagnant and has continued slack. Certain districts of Carnarvonshire have been fairly employed, and the only suggestion of any upward movement is that a slight improvement on a year ago is reported in the Festiniog district. The Ballachulish (Argyllshire) quarries still remain quiet.

We are informed that the minimum thickness, above which slabs of slate will be dutiable as roofing slates under No. 233 of the German Tariff at the rate of 65 pfg. per 100 kilogs., has been reduced from five to four millimetres, and that the same duty will be applicable to slabs of a thickness of four millimetres or less which are naturally of a blue-grey colour and are richly sprinkled with iron pyrites.

THE PORTLAND CEMENT TRADE

There has been but little change in the market position of Portland cement since our last report. With the advent of winter, manufacturers are expecting some falling off in the demand, although, so far, deliveries appear to be well up to output, stocks consequently remaining at a very low point for the time of year; in fact, we know of quite a number of concerns which are delivering their product into craft straight from the grinding mills. The course of business will be governed, to some extent, during the next few months by the export demand, but there is every indication that this will keep active throughout the winter months. Another factor for consideration is the position of manufacturers on the continent, and with regard to this our information leads us to form an opinion decidedly against any retrogression of price, for not only is the domestic demand better than it has been for a great many years past, but they appear to be extremely busy with export orders, and in many cases it is impossible to get quotations for delivery during the next few months. This state of things has naturally influenced the price of Portland cement on the continent, and for all the reputable brands of artificial cement good prices are being secured, and, indeed, the range of prices on the continent for genuine cement—apart from the natural product—is for the first time for many years past above the prices which are being secured by manufacturers in this country. The imports of natural cement to the United Kingdom continue to diminish, which is satisfactory from every point of view, while, as will be seen below, the exports from the United Kingdom last month again showed a substantial increase on the corresponding month of last year.

With regard to the home position, although the building trade continues dull, there are quite a number of substantial contracts on the point of being placed which will require large quantities of cement. With regard to London, the amended Building Act, which comes into operation on January 1st next, will result in a big demand for material, and we understand that in the first list of "thrust out" shops which have been scheduled for new concrete roofs no fewer than 14,000 shops have been included, and this is considered only a commencement of the shop schedules, while the total number already scheduled for alterations of various kinds reaches something like 100,000 buildings. On the whole, therefore, prices for the commodity are not likely to recede, and buyers should bear in mind that the advanced level now reached barely covers the manufacturer for his increased cost of manufacture.

The returns of imports and exports of cement for building and engineering purposes for October, as compared with the same month in 1904 and 1905, are as follows :—

IMPORTS.

	1904.	1905.	1906.
Tons	24,463	18,798	16,373
Value	£33,698	22,839	21,949

EXPORTS.

	1904.	1905.	1906.
Tons	31,438	41,436	60,225
Value	£52,541	64,255	96,664

Our Consul-general at San Francisco reports that after five months have elapsed since the earthquake there is very little sign of any permanent construction. Speculative trading after the disaster has caused further losses. It was at once seen, for instance, that cement would be required in large quantities. Several ships were chartered to bring it over, and the first arrivals were sold at good prices. But everybody ordered cement, and the market is overstocked, and there is no place to store it. The cash for these orders was, as a rule, advanced by the banks against the bills of lading. The banks lose, temporarily at any rate, the advance made, and the consignees are still more deeply burdened with debt.

The customs' tariff decision has been come to that Keene's and Parian cement imported into the South African Customs Union shall be classed as "goods unenumerated" and subjected to a duty of 15 per cent. *ad valorem*. A 3 per cent. rebate is allowed upon the produce of the United Kingdom and reciprocating colonies.

The Universal Portland Cement Company, a new subsidiary company of the United States Steel Corporation, has taken over the plants and business of the cement department of the Illinois Steel Company, Chicago, and will continue the manufacture of Universal Portland cement of the same high quality as heretofore.

The present output of 6,500 barrels a day of Portland cement at South Chicago, Ill., and Buffington, Ind., is being increased by a new plant at Buffington, with a capacity of 6,000 barrels a day, and a plant at Universal, Pa., near Pittsburgh, to have a capacity of 4,500 barrels a day. When the new plants are in operation in the summer of 1907 the total output will be 17,000 barrels a day. The cement manufactured in the new mills, as well as the old, will be made from slag and limestone by the same special process that has been employed by the Illinois Steel Company since May, 1900. In the manufacture of Universal Portland cement the two raw materials, crushed limestone and chilled blast furnace slag, are first dried, then thoroughly ground together in proper proportions, and burned to a clinker in rotary kilns. This clinker is afterwards finely ground.

This is a true Portland cement although made from slag, and should not be confused with so-called "slag cements," which are simply mechanical mixtures of slag and slaked lime ground together without burning, the latter being suitable only for use under ground and in moist situations. When the new mills are in operation the output of the Universal Portland Cement Company will exceed 10 per cent. of that of the entire country. Both the new plants will be driven entirely by electric power, from generators connected to gas engines using blast furnace gas. The power will be transmitted 10 miles to Buffington from the South Works of the Illinois Steel Company at South Chicago, from which point the supply of slag will be obtained. For the plant at Universal, Pa., near North Bessemer, the power will be transmitted 7 miles from the Carrie Furnaces, Homestead Works of the Carnegie Steel Company, which furnaces will also supply the slag. The cost of the two new plants will be $3,000,000. Contracts have been placed for 21 rotary kilns 7ft. 6ins. in diameter and 120ft. long, and 47 tube mills. The buildings at each of these cement plants, consisting of raw material bins, dryer building, raw material mill, burner building, finishing mill, stock houses and miscellaneous buildings, such as machine shop, transformer station, office and laboratory, are being built entirely of steel and concrete.

THE IRON AND STEEL TRADES.

The past month has shown no disquieting features. In the manufactured branches of the iron and steel trades prices have been maintained, notwithstanding the decrease in orders received by makers, for they are well supplied at present and have to work full time, while there is every prospect of the demand shortly looking up, so as to offer them a continuance of work as soon as they have fulfilled standing orders. In fact, it is already reported from several quarters that good orders have been received. The strike in the shipbuilding trades on the Clyde naturally restricts the demand for structural steelwork, and there are also fewer orders for ships being given out, probably because of the large amount of tonnage just, or nearly, completed, which is bound to lower freights shortly, but the cheaper rate at which yards are now prepared to accept orders has led new contracts to be placed. In any case it does not appear as if prices will fall, as the increased rates for raw material should prevent it—if anything, they are likely to rise.

In regard to the pig iron market, the shortage in supplies in the United States, as has been expected for some time, has at last resulted in considerable buying from this quarter. It was at first thought that the buying might be speculative, but it now appears to be legitimate, and cargoes have shipped. The result is that prices have advanced. The decrease in the stocks of the public stores is very considerable, and prospects are excellent. As regards Lancashire, though the demand for pig iron is somewhat slow, the market is firm, in view of the large shipments to America and Germany. In the manufactured iron branch makers are hardly able to cope with the demand.

In South Staffordshire pig iron prices have advanced, and manufactured iron and steel are also in strong demand.

As regards the North of England market, the American demand has been chiefly received, and raw material is strong. The manufactured iron and steel market in the Middlesbrough district is a little troubled by the shipbuilding labour troubles, but as yet the mills are kept in full swing.

In Scotland the labour troubles have restricted business somewhat.

As regards the Foreign market, America is unable to cope with the home trade. Germany and Belgium are both busy, although the international selling price of structural steel remains unchanged.

A decision has just been reached by the United States Steel Corporation to build three or four new blast furnaces in the Pittsburg district. The additions will be chiefly at the Duquesne plant, though it is probable that one furnace will be built at Dorona. The open hearth steel capacity of the corporation will be increased at the same time by the building of 30 50-ton furnaces. These latter additions will be made chiefly at Pittsburg district plants, but it is probable that some of the new open-hearth capacity will be erected in the Cleveland district at the works of the American Steel and Wire Company.

The returns for imports and exports in certain branches of manufactured iron and steel for the month of October, as compared with the same month in 1904 and 1905 are as follows :—

		Imports.			Exports.	
	1904.	1905.	1906.	1904.	1905.	1906.
Puddled Iron - tons	8,768	9,965	10,962	67,095	95,740	153,294
Wrought iron, in bars, angles, rods and sections	7,325	10,418	8,469	11,431	13,446	15,551
Rails	2,542	1,497	534	25,627	50,158	40,248
STEEL :—Girders, beams, joists and pillars from Belgium	6,929	8,280	4,998	3,601	5,255	8,033
" " " " other countries	2,008	2,055	4,435			
Ingots, blooms, billets, slabs, sheet bars, tin plate bars, or similar partly manufactured	41,744	57,431	32,834	413	314	1,741
Bars, angles, rods and shapes or sections	11,323	2 847	3,830	13,885	14,121	19,609
Galvanized sheets (flat or corrugated)	—	—	—	34,059	34,964	37,925

OTHER METALS.

The Copper market has managed to check the extraordinary speculative advance for the moment, but a famine in the metal still threatens, and the position is so strong intrinsically that prices are bound to be high and almost certain to advance.

Tin has been in almost as much demand as copper, but prices should now remain stationary, as the busiest season is now approaching its close.

Lead also continues strong, and the stock in the market is reduced.

THE IRONMONGERY TRADES.

Employment in the lock and latch trades at Wolverhampton has been bad, and worse than a month ago. With makers of hollow-ware trade has continued good, and with hurdle and fence makers it has been fair. Employment with hollow-ware stampers has continued slack at Sheffield.

Employment has continued quiet in the stove, grate, &c., trades at Rotherham. At Leeds it has continued slack, with short time; at Glasgow it has been bad, and worse than a month ago; and at Falkirk it has continued fair. At Bolton and Bury it has been good.

With nut and bolt makers at Winlaton employment has continued good; and at Dudley and Darlaston it has been good, and better than a month ago. At Birmingham it has been fair and improving with wire nail makers, fair with cut nail makers, and moderate with rivet makers. At Blackheath it has continued quiet with rivet makers, and fair with wrought nail makers.

Employment has continued good with wire makers, but at Glasgow it has been dull with wire weavers.

The returns for imports and exports for October, as compared with the same month in 1904 and 1905, are as follows :—

		Tons.			Value.	
Imports.	1904.	1905.	1906.	1904.	1905.	1906.
Wire nails	2,452	3,002	3,303	£25,092	30,618	37,489
Nails (other than wire nails), screws and rivets	950	1,439	780	15,952	21,554	12,680
Bolts and nuts	288	420	333	4,359	5,949	5,959
Exports.						
Nails, screws and rivets	1,938	2,317	2,068	39,747	43,345	37,870
Bolts and nuts	1,312	1,708	1,622	23,139	30,530	28,334

THE WALLPAPER TRADE.

The wallpaper trade shows little or no movement. The Board of Trade returns of exports and imports for the ten months of this year ending September 30th show that the importation of paper-hangings is nearly 21 per cent. greater than last year; the exports have improved less—namely, about 5·5 per cent. better than last year, and about 4 per cent. better than 1904.

The following is the return of paper-hangings for October, issued by the Board of Trade :—

	1904.	1905.	1906.
Imports.			
Cwts.	—	3,563	4,302
Value	—	£9,371	11,408
Exports.	1904.	1905.	1906.
Cwts.	5,200	4,951	4,768
Value	£13,725	12,514	11,362

THE PAINT TRADES.

The paint trades continue fair. As regards materials, the returns for imports and exports for October, 1906, as compared with the same month in 1904 and 1905, are as follows:—

		Quantity.			Value.		
IMPORTS.		1904.	1905.	1906.	1904.	1905.	1906.
White lead	Cwts.	24,028	27,976	22,073	£18,941	23,477	20,984
Zinc oxide		126,365	24,510	24,407	75,319	22,956	27,427
Other colours and pigments			109,154	135,559		55,493	70,242
Turpentine		11,701	52,303	45,452	21,495	121,446	99,135
Lac-dye, seedlac, shellac and sticklac		11,392	9,104	5,813	99,655	71,245	57,640
Linseed oil	Tons	171	589	972	3,791	9,434	18,226
EXPORTS.							
White lead	Cwts.	24,029	31,138	37,063	23,039	30,976	40,337
Zinc oxide		116,429	5,603	11,664	132,349	6,497	15,127
Other colours and pigments			130,393	126,143		155,897	155,982
Linseed oil	Tons	2,451	2,094	2,582	44,199	41,176	59,057

THE GLASS TRADE.

The glass trade continues fair. Employment with sheet glassmakers and flatteners in South Lancashire has been good in the past month. With glassblowers in London a slight decline was shown.

The returns for imports and exports of glass for the month of October, 1906, as compared with the same month in 1904 and 1905, are as follows:—

	Cwts.			Value.		
IMPORTS.	1904.	1905.	1906.	1904.	1905.	1906.
Window and German Sheet, including shades and cylinders	75,554	141,435	123,317	£45,845	81,543	67,543
Plate	32,573	34,157	36,850	38,220	42,818	51,237
EXPORTS.						
Plate	7,330	11,346	12,758	12,049	16,642	18,885

THE TIMBER TRADE.

London Market in October.

October has been a month of very large importation, of dear money, and of dropping prices on the London wood market. It has also been a month of considerable trade, as, although the dock deliveries are 1,100 standards short of those of the same month last year, the overside deliveries are 3,100 standards greater, leaving a credit balance of 2,000 standards in favour of the month just ended. Nevertheless, Messrs. Churchill & Sim point out that the dock stock has accumulated freely, and is now about 5,000 standards larger than it was last year. In the meantime Swedish shippers have paid no attention whatever to any weakness here, but have cleared off the balance of their available supplies at the fullest rates of the season to country and continental markets. Russian shippers have made concessions only for goods already chartered for to London, which have mostly been sold at very moderate cost freight and insurance prices. There is every indication that shippers will ask and obtain for next year the highest rates current this season and upwards, so that stock in London should be good holding in the meantime, although the great scarcity and the high price of money makes this difficult. The position is that, at the rates to which the London market has now fallen, wood can be bought at well under the cost of anything that is at all likely to be brought in either this year or next.

Messrs. Denny, Mott & Dickson's report is as follows:—Business during October has been quiet. The steadily improving tone of the previous two months doubtless received a check by the disturbance to ordinary business caused by the almost dramatic suddenness of the Bank Rate being put up to 6 per cent., causing a check in general business facilities and some apprehension as to "a squeeze in money" sufficient to threaten a disastrous strain on weak traders, and to clip the already keenly cut profits of the strongest. The legitimate trader has to largely bear the penalty of undue advances to mere speculators both at home and abroad. It is, however, to be hoped that "the squeeze" will pass and home trade not be handicapped by a higher Bank Rate than 5 per cent. after the turn of the year. Meantime caution is very necessary.

The abstract of dock stock, consumption, &c., for October, published by Messrs. Foy, Morgan & Co., is given in the table at the foot of this page.

Dock Stock.

The stock of wood in the public docks on October 31st was:—

	Pieces.
Foreign deals and ends	2,355,000
Do. battens	3,280,000
Pine deals and battens	751,000
Spruce do. do.	932,000
Boards, rough	4,685,000
Do. prepared	6,931,000

totalling 18,934,000 pieces, as against 17,715,000 in 1905, 20,195,000 in 1904, and 22,280,000 in 1903.

In other kinds the stock was as follows:—

Foreign wainscot logs	268 pieces.
Do. oak timber	1,028 loads.
Do. fir timber	3,571 do.
Do. Oregon pine, &c., spars and masts	4,140 do.
Colonial oak timber	1,098 do.
Do. birch timber and planks	9,119 do.
Do. elm and ash timber	1,010 do.
Do. yellow pine	690 do.
Do. red pine	32 do.
United States pitch-pine timber	20,259 do.
Do. do. deals	69,000 pieces.
East India teak	7,247 loads.

Deliveries.

The deliveries have been—

	First ten months. Pieces.	October. Pieces.
Foreign deals and ends	2,606,000	283,000
Do. battens	4,014,000	353,000
Pine deals and battens	812,000	79,000
Spruce do. do.	902,000	92,000
Boards, rough	4,028,000	409,000
Do. prepared	11,150,000	1,124,000
Total	203,512,000	2,340,000

The deliveries direct from ship to craft have been—

	First ten months. P.s.h.	Cctober. P.s.h.
Deals and battens	108,812	14,436
Boards	20,451	2,234
Total	129,263	16,670

Soft Woods.

Swedish Deals, Battens and Boards.—Arrivals during October were very large, quite swamping all comparison with those of last year. The market has not been able to bear this strain, and prices for all three have fallen rather heavily from the level current in the summer. Prepared boards have perhaps suffered most, but they are showing signs of recovery. Battens are down from 5s. to 10s. per standard from the summer prices, while deals come nearest to holding their own, partly because they have never been very high in this market at any time of the year.

Norwegian Boards.—The arrivals of prepared boards from Norway were also large during October: nearly double those of October, 1905. Prices fell away steadily during the first three weeks of the month, but a lack of pressure to sell, and an improving demand, have brought about the beginning of a change for the better.

Russian Deals and Boards.—The supply of deals during October was about double, and of boards about three times that of October, 1905, while battens are also in excess. This supply has been brought in cheaply, the shippers bearing the brunt of the fall in prices, so that the importing merchants should reap a corresponding advantage.

Finnish Battens.—Even from Finland the arrivals of small battens during October were largely in excess of those of October last year, and, the market being unprepared for this, prices have dropped away freely. At the reduced rates, however, the demand is proving very satisfactory.

Prussian Timber.—The quantity of fir timber imported during October was only half that of October last year, and with a fairly good undertone to the market quotations for suitable wood have shown a tendency to improve. For oak also the demand has been much more satisfactory, and the dock stock is reducing quite rapidly at fairly remunerative prices.

Canadian Timber.—The importation of pine deals during October was quite small, and prices have begun to move ahead again. The demand is, of course,

ABSTRACT OF STOCK, CONSUMPTION, &C., IN LONDON DOCKS, FOR OCTOBER.

All Docks.	Deals (Fir).	Battens (Fir).	Pine.	Spruce.	Pitch-pine Deals.	Deals and Battens in Aggregate.	Rough Boards (All Countries).	Flooring.	Floated Timber.
	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Loads.
Public dock stock	1,998,041	3,568,592	752,455	932,601	68,753	7,320,442	4,685,263	6,931,495	29,000
Monthly public dock consumption	229,619	383,257	75,117	90,354	16,424	794,771	421,977	1,095,449	3,050
Overside stock	1,012,620	1,690,163	331,266	398,461	—	3,432,510	1,860,919	646,315	—
Overside consumption (estimated of dock):—									
98 per cent. Sawn 63 ,, Planed	225,027	375,592	73,615	88,547	—	762,781	413,537	690,133	—
Duration of supply at same rate of consumption	6.62 months.	6.93 months.	7.29months.	7.44 months.	4.19 months.	6.90 months.	7.83 months.	4.24 months.	9.51 months.

still very restricted, and must be so at the present level of cost. Spruce deals have arrived in about normal quantities from the St. Lawrence, but are short from New Brunswick. Of oak, elm and ash timber there is no superfluity on the London market, and retail business is possible at improving prices. There was a considerable importation of sawn timber during the month, which has brought up the dock stock again.

Hard Woods.

Teak.—The landings in the docks in London during October consisted of 284 loads of logs and 271 loads of planks and scantlings, or a total of 555 loads, as against 837 loads for the corresponding month of last year. The deliveries into consumption were 614 loads of logs and 389 loads of planks and scantlings—together 1,003 loads, as against 612 loads for October, 1905. The consumption shown for the month is fairly satisfactory, but the bareness of the stock of logs becomes very accentuated. Of 4,672 loads, a full third came from Java, and consumers have not yet learned to freely use this description of teak. Prices naturally continue to harden, more especially as no large supplies are in sight, and the reports from the shipping ports as to the new season's supplies continue to be of a discouraging nature.

Mahogany.—Business in this market has been restricted owing to the light supplies. Tobasco and African descriptions are very bare, and fresh supplies would be welcomed. The condition of the market does not tend to easier prices, but the demand for consumption is too quiet to cause any radical stiffening, and a steady market for some time to come is probable.

MISCELLANEOUS.

The Customs Tariff decision has been come to that asbestos sheets for roofing imported into the South African Customs Union from foreign countries will be classed as "substances for building purposes" and subjected to a duty of 3 per cent. *ad val.* If manufactured in the United Kingdom or Colonies they will be admitted free.

San Francisco.—Our Consul-General at San Francisco, reporting on September 13th last, says: Five months have now elapsed since the earthquake, and there is very little sign of any permanent construction. The mass of debris, millions of tons of it, remains more or less where it was. The amount removed is barely noticeable, although in the aggregate it is large. Some of the principal streets are cleared sufficiently to allow of the passage of electric cars and wheeled traffic, but except in some of the main streets the pavements are still more or less obstructed. Business is active, but the wholesale and retail trade is much hampered for want of warehouses and depôts for storing stocks. The volume of trade has probably not much decreased, but the nature of the goods sold is not what it was before the disaster. Everything is of a cheaper kind. Had things otherwise been normal, had the insurance money been paid up well, and had not labour troubles come in an acute form on top of a disordered commerce, things might have righted themselves more quickly. But insurances in many cases have not been paid. If the earthquake made outside capitalists cautious as to investments in San Francisco, the labour question, now so acute, has frightened them still more. Even before the earthquake and the advance in wages a building could be put up in Los Angeles, where Labour Unions are not supreme, for 30 per cent. less than in San Francisco. Now the cost of building is almost prohibitive, and a man will think carefully before he puts up, at enormous cost, a building which can hardly make any return on the capital invested.

Builders' Notes.

Messrs. Patman & Fotheringham, Ltd., of 100 and 102, Theobald's Road, W.C., have secured the contracts for Messrs. Hunter & Hyland's large new warehouse, offices and showrooms in High Holborn, W.C. (Mr. Henry Smith, architect), and the New Hospital, Vincent Square, Westminster (Messrs. Read & Macdonald, architects).

Evils of the Speculative Building Trade.—The Building Material Trades' Association of Liverpool and the Manchester and District Builders' Merchants' Association have issued a joint letter on the evils existing in the speculative building trade, together with a paper on the land-jobber and the speculative builder, read recently before a conference of the members of the two associations by Mr. W. H. Dowler. Mr. Dowler said: "It is all very well to suggest that the only way to deal with the so-called speculative jerry-builder is to stop giving him credit. But is this seriously meant, and does it in any case deal with the legal question? Besides, where is credit to begin, and where is it to end? What we want is something giving suppliers of materials, and creditors generally, an equal legal charge with the landowner on any assets, which no private contract entered into previously between a landowner and builder can make void." Mr. Dowler finds his remedy in what is known as the Mechanics' Law of Baltimore, which provides for liens upon buildings in progress or completed, but not paid for.

The Claims of Piece-Work.—In giving the toast of "The Federation" at the recent annual dinner of the Lancaster and District Master-Builders' Association, Mr. T. Till said it seemed that the building trade suffered more than others, because their work was chiefly contract time-work and they had to pay men a standard wage, whether they were worth it or not. On this account the building trade had become the most speculative trade in existence. Many of the associations were feeling that matters should be put on a new footing. It would be advantageous to the trade if they could adopt a system of piece-work, and have a guarantee that they were getting value for their money. The advantage would not be altogether on the masters' side, but very much on the side of the best men. The standard wage system was not fair to the best men. Some men were worth more and others less, and, therefore, the best men suffered at the expense of the inexperienced. He knew this was in antagonism to the views of trades-unionists, but he did not think the present system conduced to clever workmanship. They would not encourage men of ability until piece method was applied to the building trade. As to the condition of trade in Lancaster, he did not think there had ever been such a bad time experienced as during the last two or three years. They could not expect much improvement when the principal jobs were going out of the town.

The Labour Market

Board of Trade Returns for September.

Employment in the month of September continued dull, and was not so good as in August, but was slightly better than in September last year.

In London

employment showed, on the whole, a decline as compared with August last and September, 1905. Returns received by the Board of Trade from 51 London employers showed that in the last week of September 10,359 workpeople were paid wages, as compared with 10,525 in August, 1906, and 12,136 in September, 1905.

From Trade Union returns relating to carpenters and joiners it appears that the percentage of unemployed in London at the end of September was 6.5, as compared with 5.5 in August, and 7.1 in September, 1905. With plumbers the percentage for September was 9.2, for August 7.5, and for September, 1905, 9.9, the improvement shown in August not having been maintained. With painters and builders' labourers a considerable decline was shown. There was little change with bricklayers, but with plasterers and masons a slight improvement was shown.

The Provinces.

Returns received from 69 employers' associations in towns outside London show that in these towns employment continued slack generally, and showed little change compared with a year ago.

The Trade Unions report:—Employment with bricklayers continued to decline; with stonemasons it improved slightly. With carpenters and joiners it continued slack, showing a slight decline on August, but it was better than in September, 1905. With plasterers the improvement shown in August was maintained; with slaters, painters and with builders' labourers a slight decline was shown.

In the Northern Counties

employment was quiet generally, showing little change. In the Wear district it continued bad with plasterers.

In Yorkshire.

employment was quiet and not so good as in August.

In Lancashire and Cheshire

employment on the whole was fair, but showed a slight decline on August.

In the Midlands and Eastern Counties

employment in the Leicester district showed a slight improvement with masons and labourers. It was moderate, on the whole, in the Potteries. At Birmingham it was slack, at Coventry it was fairly good. In Norfolk it continued to decline.

As regards the Southern and South-Western Counties,

employment in the Plymouth district was moderate with bricklayers. In the South Wales district it was good with painters and fair with plumbers.

Scotland.

Employment in the West of Scotland was fair with bricklayers and slaters. At Edinburgh it was good with masons and fair with joiners; at Dundee it improved with masons and plasterers. At Aberdeen all branches are slack.

Ireland.

At Belfast it was fair with plasterers and moderate with bricklayers. At Dublin it continued dull.

Current Rates of Wages in Large Centres.

Towns.	Masons.	Bricklayers.	Carpenters and Joiners.	Plasterers.	Slaters.	Plumbers.	Painters.	Labourers.
	d.	d.	d.	d.	d.	d.	d.	d.
Aberdeen	8	—	8	8	8	8	8	4½–5
Accrington	9	9	8½	9	7½	8½	—	5–5½
Ashton-under-Lyne	9½	10	9	10	8¼	9	8½	5½–6½
Barnsley	9	9	8½	9	8½	8	8	6½
Barrow-in-Furness	9	9	8¾	9	9	8¼	8¼	6–6½
Bath	7½	7½	7½	7½	7½	6½ 7½	6½	5–5½
Belfast	8½	8½	8½	8¾	8	8½	8½	19s. wk
Birkenhead	9½–10	9½	9½	9½	9	—	8½	5–6½
Birmingham	10–10¾	9½	9½	10	9	9½	8½	6½–7
Blackburn	9½	10	9	9	9	9	8	5½–6½
Blackpool	9¾	9½	8½	9½	8½	9	8½	5½–6
Bolton	9½	10	9½	10	9	9	8½	6–7
Bournemouth	8	8	8	8	8	8	7½	5½
Bradord	9	9	8½	8½	9	9	8	6–6½
Brighton	9	8	8	8	8	9	7	5½
Bristol	9	9	9	9	9	9	8½	6
Burnley	—	—	8½	—	—	—	—	—
Burton-on-Trent	8½	8½	8½	—	—	—	—	5¾–6
Bury	9½	10	9½	9	9	9	8½	5–6½
Cambridge	8½	8	8	8½	8	8½	6½	5–5½
Cardiff	9	9	9	9	9	9	8⅓	5½
Carlisle	8½	8½	8	8	9	8	8	5–5½
Chatham	8	9	8½	9	9	8½	7	5½
Cheltenham	8–8½	8	8	7¾	—	8	7½	5
Chester	9	9	8½	9	9	8½	7½	5–5¾
Coatbridge and Airdrie	9½	9½	9	9½	9	8½	9	6
Colchester	8	8	8	9	8	9	6 6½	5–5½
Cork	7⅔	7⅔	7⅔	7⅔	7⅔	8	8	3⅝
Coventry	9½	8¾	9	9	9	9	8	6
Crewe	8½	8	7	9	8	8	7	5–6
Darlington	9	9	8½	9	9½	8	7½	6
Darwen	9½	9½	9	9	9	9	8¼	6
Derby	9	9	8½	9	9	8½	7½	5½–6
Dublin	8–8½	8½	8–8½	8	8	8½	7½	4¼–4½
Dudley	8½	8	8	8½	8	8	7	5½
Dundee	8½–9	10	9	8½	8½	9	8½	5¼–5½
Eastbourne	8½	8	8	9	pce.	8	7½	5½
Edinburgh	8½	9½	9	—	—	9	—	—
Exeter	8	8	7½	7½	7½	7½	6½	5
Glasgow	—	9½	10	9½	9	9	9	5½–6
Gloucester	7½	8	8	7½	7½	8	7½	5
Greenock	9½	10	9	9½	9½	9	9	5½
Grimsby	—	9	8	9	pce.	—	7½	6–7
Halifax	9	9	8¼	8½	8½	8½	7½	6
Hartlepools	9½	9	9½	9½	—	—	—	6½–7½
Hastings and St. Leonards.	8½	8	8	8½	—	8	7	5½–6
Huddersfield	9	9	8½	8½	9	7½ 8	7½	6
Hull	9¼–9¾	9	9	9	9	9	8	6½–7
Ipswich	8	8	8	9	9	8	6½	5½
Keighley	8½	8½	8	7½	8½	7½	7½	6
Lancaster	9½	10	8½	9	9	8½	8½	5½–6
Leeds	9½	9½	9	9½	9	9	8	6½–7
Leicester	9	9	9	10	9	9	8	6½–7
Leigh	9½	9½	9½	9	8½	9	8	6–6½
Lincoln	8½	8	8	9	8	8	7	5–6
Liverpool	9½–10	9½	9½	9½	9½	9½	8½	5–6
London	10½	10½	10½	11	—	11	—	—
Londonderry	7	7	7	7	6½	7	7½	15s. wk.
Macclesfield	8	8	8	7¾	6½	7½	7½	5
Manchester	9½–10	10	9½	10	9	9½	8¾	5½–7
Merthyr Tydfil	8½	8½	8	8½	8½	8	7½	5½
Middlesbrough	9	9½	9¼	9½	9½	9	8	6¼–6¾
Newcastle	9½	9	9½	9½	9½	9	8½	6¼
Newport (Mon.)	8½	8½	8½	8½	8½	8½	7½	5½
Northampton	8½	8½	8½	8½	—	8½	7½ 8	5½
North Shields	9½	9½	9½	9½	9½	9	9	6¼–6½
Norwich	9	9	8½	9	9	8½	7½	5–6
Nottingham	9½	9	9	10	9	9	8½	6½
Oldham	9½	10	9½	9	8½	9	8½	5½–7
Oxford	8½	8	8	8	8	9	7	5½
Paisley	9	9½	9	9½	9	9½	9	6
Perth	8	10	8	8	8	8	7½	5½–6
Plymouth	8	8	8	8	8	8	7	5
Portsmouth	8½	8½	8	8½	pce.	7½	6½ 7	6
Preston	9½	10	9	8½	8½	8½	8½	5½–6
Rochdale	9½	10	9	9	8¼	9	8½	5½–6½
Rotherham	9½	9½	8½	8½	8	8½	7½	6
St. Helens	9	9	9	9	9	8½	8¼	5½–6
Scarborough	8½	8½	8	8½	30s. wk.	8	7½	6
Sheffield	9½	9½	9	9	9	9	7½	5½–6½
Southampton	7½	8	8	8	pce.	8	7	5
Southport	9	9	8¾	9	9	9	8½	6
South Shields	9½	9½	9½	9	9½	8¾	8½	6¼
Stockport	9½	9½	9	10	9	9	—	6–7
Stockton-on-Tees	9	9½	9¼	9½	9½	9	8	6¼–6½
Sunderland	9½	9½	9¼	9½	9½	37s. wk.	9	6¼
Swansea	8½	—	8½	8½	—	8½	7½	5½
Torquay	7	7	7½	7	7	7	7	4½–5
Wakefield	9	8½	8	8½	8	7½	7½	6
Walsall	9	8½	8½	8½	8½	8½	7¼	5¾–6½
Warrington	8¾	9¼	9¼	9½	8½	9¼	—	6–6½
West Bromwich	9½–10	9	8½	9	pce.	8½	7	6–6½
Wigan	9½	10	9	9	8½	9	8½	5½–7
Wlverhampton	9	9	9	8½	8½	9	7½	6–6½
Worcester	8½	8½	8½	8½	8½	8½	7	5½
Yarmouth	7½	7½	7½	A	7½	7½	6	4½

A. Done by bricklayer.

Current Market Prices.

FORAGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	10	0	1	12	0
Clover, best...	per load	4	7	0	4	17	6
Hay, good	do.	4	0	0	4	5	0
Sainfoin mixture	do.	4	0	0	4	7	6
Straw...	do.	1	8	0	1	14	0

MISCELLANEOUS.

		£	s.	d.	£	s.	d.
Bricks Stocks, d/d to job	per 1,000	1	15	0		—	
Do. Flettons on rail ...	do.	1	5	0		—	
Do. Pressed Wire Cuts, d/d to job ...	do.	1	17	0		—	
Do. Blue brindled wire cuts	do.	1	2	0		—	
Do. do. wire cuts ...	do.	1	6	0		—	
Do. do. pressed facings	do.	1	17	6		—	
Coke Breeze, into carts at gasworks ...	per load	0	2	0		—	
Do. d/d to job	do.	0	4	0		—	
Sand	per yard	0	7	6		—	
Ballast	do.	0	6	6		—	
Granite Chippings ...	do.	0	10	6		—	
Do. do. ¼in. ...	do.	0	11	6		—	
Do. Broken, 1½in. ...	do.	0	15	6		—	
Do. do. 2in. ...	do.	0	15	0		—	
Do. do. 2½in. ...	do.	0	14	6		—	
Cement	per ton	1	12	0		—	
Lime	do.	1	4	0			
Glass, English Sheet, in crates of stock sizes, 15oz., 2nds	per sq. ft.	0	0	3½		—	
Do. do. do. do. 3rds.	do.	0	0	2½		—	
Do. do. do. 21oz., 2nds.	do.	0	0	5		—	
Do. do. do. do. 3rds	do.	0	0	3½		—	
Do. do. do. 26oz., 2nds	do.	0	0	6		—	
Do. do. do. do. 3rds	do.	0	0	4¼		—	
Do. do. do. 32oz., 2nds	do.	0	0	8		—	
Do. do. do do. 3rds	do.	0	0	6		—	
Do. English patent plain rolled plate in stock crates ⅛	do.	0	0	2		—	
Do. do. do. 3/16	do.	0	0	2¼		—	
Do. do. do. ¼	do.	0	0	2½		—	
Castor Oil, French ...	per cwt.	1	9	0		—	
Colza Oil, English ...	do.	1	13	6		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	15	0	2	17	0
Lead, white, ground, carbonate	per ton	16	0	0		—	
Do. red	do.	15	0	0	19	0	0
Linseed Oil, barrels ...	per cwt.	1	1	7½		—	
Petroleum, American ...	per gal.	0	0	6⅛	0	0	6¼
Do. Russian ...	do.	0	0	5⅝	0	0	5⅞
Pitch	per barrel	0	9	0		—	
Shellac, orange	per cwt.	10	12	0		—	
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Town	per cwt.	1	14	6	1	15	6
Tar, Stockholm	per barrel	1	5	0		—	
Turpentine	per cwt.	2	8	9		—	

METALS.

		£	s.	d.	£	s.	d.
Standard Copper	per ton	98	10	0	99	0	0
Do. Strong sheets ...	do.	113	0	0	113	10	0
Lead, soft foreign	do.	19	10	0	20	0	0
Do. English	do.	20	0	0	20	10	0
Do. pipes...	do.	21	10	0	22	0	0
Do. sheets	do.	21	0	0	21	10	0
Galvanised Corrugated sheets	do.	13	5	0	13	10	0
Spelter G.M.	do.	27	10	0	28	0	0
Angles, Scotland	do.	6	15	0	6	17	6
Bars, do.	do.	7	15	0	8	0	0
Marked bars, Staffs. ...	do.	8	7	6	8	10	0
Common bars, do. ...	do.	6	17	6	7	0	0
Angles, M'boro.	do.	6	10	0	6	12	6
Joists, M'boro	do.	6	5	0	6	10	0
Angles, Midlands	do.	6	15	0	6	17	6
Joists do.	do.	6	17	6	7	0	0
Girder plates, Midlands ...	do.	7	10	0	7	12	6
Angles, Foreign, c.i.f. Thames	do.	6	17	6	7	0	0
Tees do. do. do.	do.	7	0	0	7	2	6
Joists, do. do. do.	do.	6	5	0	6	7	6
Channels do. do. do.	do.	6	10	6	6	12	6
Plates do. do. do.	do.	7	5	0	7	7	6
Tin, Foreign	do.	194	0	0	194	10	0
Do. English ingots ...	do.	194	0	0	195	0	0
Zinc, sheets, Silesian, f.o.b.	do.	32	0	0	32	5	0
Do. do. V.M. do.	do.	32	5	0	32	10	0

TIMBER.

Soft Woods.

		£	s.	d.	£	s.	d.
Fir, Dantzic and Memel	per load	3	10	0	4	17	6
Pine, Quebec, Yellow ...	do.	3	12	6	6	10	0
Do. Pitch, American ...	do.	3	16	0	6	0	0
Laths, log, Dantzic	per cu. fath.	4	0	0	6	0	0
Deals, Archangel, Yellow, 3rd, 4×9	per std.	10	5	0	10	10	0
Do. do. do. do. 3×9	do.	10	5	0	10	10	0
Do. do. do. 4th, 3×9	do.	9	0	0		—	
Do. Blankaholm, Yellow, 1st, 4×9	do.	10	5	0		—	
Do. do. White, 1st, 3×9	do.	8	15	0		—	
Do. do. do. 2nd, 3×9	do.	8	5	0		—	
Do. Borgo, Yellow, unsorted, 2½×7	do.	9	5	0		—	
Do. Gam eby. White, unsorted, 3×11	do.	9	0	0		—	
Deals Hudikswall, Yellow, 5th, 2½×7	per std.	9	5	0	9	10	0
Do. Karlskrona, White, unsorted, 3×7	do.	8	0	0		—	
Do. do. do. do. 3×8	do.	8	5	0		—	
Do. Kaunissaari, Yellow, unsorted, 2½×7	do.	9	0	0		—	
Do. Lulea, Yellow, 2nd, 3×9	do.	9	5	0		—	
Do. Langror, Yellow, 4th, 3×7	do.	10	5	0		—	
Do. do. do. do 2½×7	do.	10	0	0	10	5	0
Do. Narva, Yellow, 1st, 2½×7	do.	8	15	0		—	
Do. Onega, Yellow, 5th, 3×9	do.	8	0	0		—	
Do. Quebec, Spruce, 2nd, 3×9	do.	9	5	0	10	0	0
Do. do. do. 3rd, 3×7	do.	8	0	0	8	5	0
Do. Riga, White, 1st & 2nd, 3×11	do.	10	0	0		—	
Do. St. Petersburg, Yellow, 3rd, 3×11	do.	7	10	0		—	
Do. do. do. do. 3×7	do.	8	5	0		—	
Do. do. do. unsorted, 2½×7	do.	8	15	0		—	
Do. Soderhamn, Yellow, 1st, 2½×7	do.	11	0	0		—	
Do. Umba (WhiteSea) Yellow, 4th, 3×11	do.	8	15	0		—	
Do. do. do. do. 3×9	do.	5	5	0		—	
Battens, Abo, Yellow, 1st & 2nd, 2×4	do.	9	5	0		—	
Do. Borga, Yellow, unsorted, 2×4	do.	9	10	0		—	
Do. Fredrikshamn, Yellow, 1st & 2nd, 2×4	do.	9	5	0	9	10	0
Do. do. do. do. 2×3½	do.	8	15	0		—	
Do. do. do. do. 2×3	do.	9	0	0		—	
Do. do. White, do. 2×4	do.	8	10	0		—	
Do. Fredriksstad, Yellow, unsorted, 2×4	do.	8	5	0		—	
Do, Gamleby, Yellow. unsorted, 2×5	do.	8	5	0		—	
Do. Kotka, do. do. 2×9	do.	9	0	0		—	
Do. do. do do. 2×5½	do.	8	0	0		—	
Do. Kaunissaari, Yellow, unsorted, 2×4½	do.	8	5	0		—	
Do. Karlskrona, Yellow, unsorted, 2×4	do.	8	10	0		—	
Do. Norrkoping, Yellow, 1½×8	do.	5	5	0		—	
Do. do. do. & White, 1×9	do.	7	10	0		—	
Do. Oscarshamn, Yellow, 1st & 2nd, 2×4	do.	8	0	0		—	
Do. Sorn s, Yellow, unsorted, 2×5	do.	8	10	0		—	
Do. St. Petersburg, Yellow, 3rd. 1½×6	do.	7	15	0		—	
Do. do. do. unsorted, 1×7	do.	9	0	0		—	
Do. do. White, 3rd, 1×4½	do.	7	10	0		—	
Do. do. do. do. 1×7	do.	8	10	0		—	
Do. Umba (White Sea) Yellow, 4th, 1½×7	do.	9	0	0		—	
Do. do. do. do. 1¼×7	do.	9	0	0		—	
Do. do. do. do. 1¼×6	do.	8	10	0	8	15	0
Do. do. do. do. 1×7	do.	9	15	0		—	
Do. do. do. 3rd, 1×7	do.	10	15	0		—	
Flooring Boards, Dram, Yellow, unsorted, ⅞×6½	do.	0	8	3		—	
Do. Fredriksstad, Yellow, 2nd. 1¼×7	do.	0	13	9		—	
Do. do. do. do. 1×7	do.	0	11	9		—	
Do. do. do. 3rd, 1¼×7	do.	0	11	9		—	
Do. do. do. do. 1×7	do.	0	10	6		—	
Do. do. do. do. ⅞×7	do.	0	8	9		—	
Do. do. do. do. ⅞×6½	do.	0	8	6		—	
Do. do do. unsorted, 1×7	do.	0	10	3		—	
Do. do. do. do. 1×6	do.	0	9	9		—	
Do. do. do. do. 1×5½	do.	0	9	6		—	
Do. do. do. do. ⅞×7	do.	0	9	0		—	
Do. do. do, do. ⅞×6	do.	0	8	9		—	
Do. do. Mixed White ⅞×6	do.	0	8	6		—	
Do. Fredrikshald, White, 3rd, ⅞×5½	do.	0	8	0		—	
Do. do. Mixed White, ⅞×5½	do.	0	8	3		—	
Do. Holmsund, Yellow, 3rd, ¾×7	do.	0	8	3		—	
Do. Skutskav, Yellow, 2nd, 1×6½	do.	0	10	6	0	11	0
Do. Swartwik, Yellow, 1st, 1×6½	do.	0	12	3		—	

Hard Woods.

		£	s.	d.	£	s.	d.
Ash, Quebec	per load	4	5	0	7	7	6
Birch, New Brunswick ...	do.	2	0	0	4	10	0
Do. Quebec	do.	2	0	0	4	10	0
Box, Turkey	per ton	6	0	0	20	0	0
Cedar, Cuba	per ft. sup.	0	0	4½	0	0	6
Do. Honduras	do.	0	0	4	0	0	5½
Do. Tobasco	do.	0	0	5⅝		—	
Elm, Quebee	per load	4	0	0	8	5	0
Jarrah, planks	per ft. cu.	0	2	6	0	3	0
Mahogany, Average Price for Cargo, Honduras	per ft. sup.	0	0	4½	0	0	5½
Do. Tobasco ...	do.	0	0	4	0	0	5½
Do. Cuba ...	do.	0	0	4½	0	0	5½
Do. African ...	do.	0	0	3½	0	0	5½
Do. Lagos ...	do.	0	0	3½	0	0	5½
Oak, Wainscot	per log	2	5	0	6	0	0
Teak, In ian, logs ...	per load	9	5	0	19	10	0
Do. do. planks ...	do.	13	15	0	20	10	0
Whitewood, American, logs	per ft. cu.	0	1	3	0	1	6
Do. do. planks and boards ...	do.	0	1	3	0	3	6

THE BUILDERS' JOURNAL
AND ARCHITECTURAL ENGINEER.

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In our issue for November 28th we shall publish a special article on

NEW BUILDINGS IN GLASGOW,

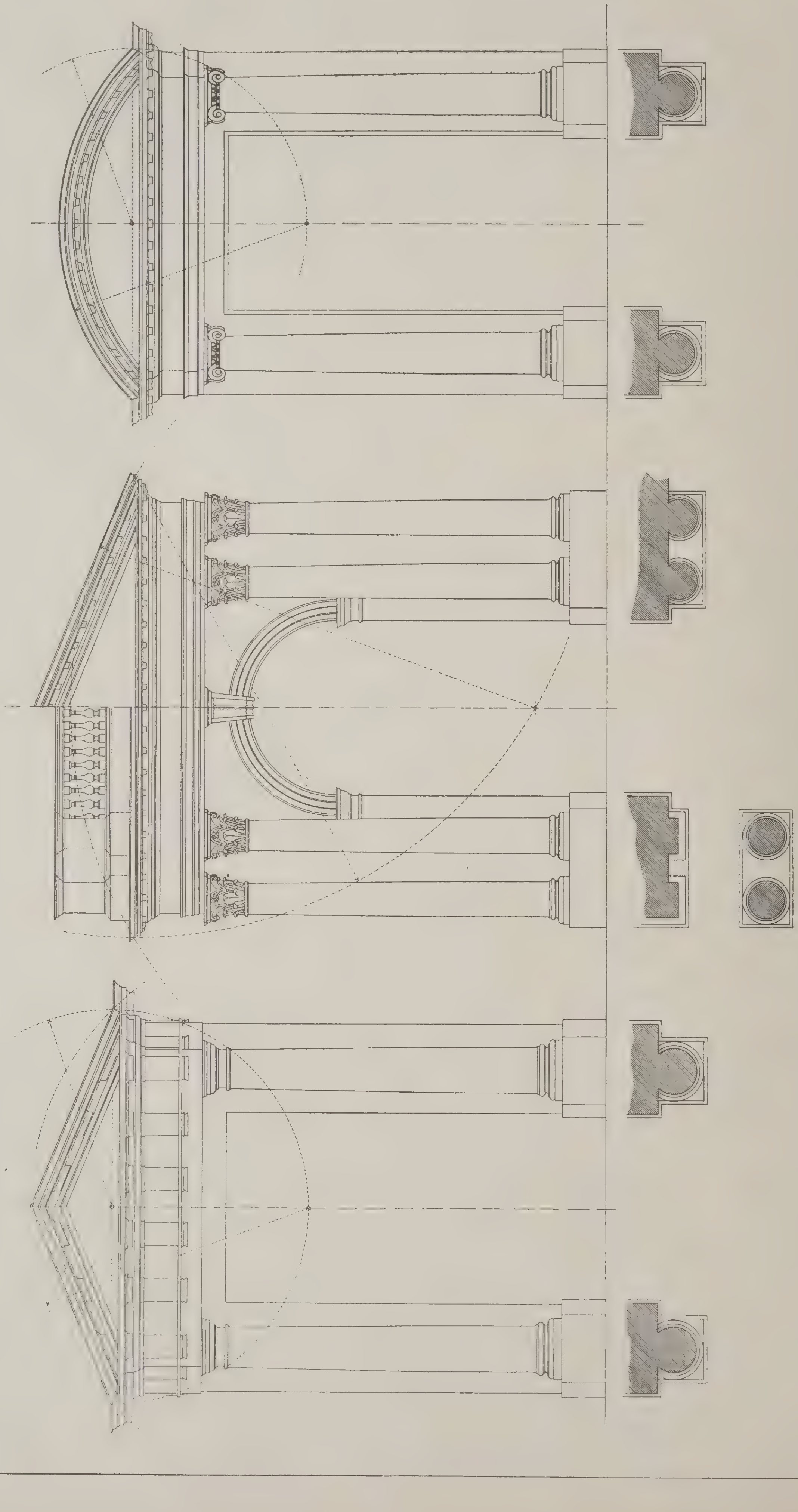
which will be illustrated by a large number of photographs and drawings.

No Hope in the Strand. NOBODY can say that a determined effort has not been made to get an alteration effected in the northern frontage of the Strand between Wellington Street and St. Clement Danes. Mr. Thornycroft first took up the matter three years ago, and he has been strongly supported by the Further Strand Improvement Committee, the Royal Institute of British Architects, the Royal Academy, the Surveyors' Institution, and a host of distinguished memorialists. But the Improvements Committee of the London County Council has not budged from the position which it took up at the start. It assures us that it has given "most anxious consideration" to the matter, and "the fullest weight" to the views of the distinguished memorialists, but it comes back always to the financial argument. It has had a number of calculations worked out as to what the Council would stand to lose if the proposal were carried out, and these figures of course show a very large loss of revenue. The broader aspect of the question—namely, the great civic improvement to be effected—seems to have no appeal to the Committee, which is all for cutting down expenses. In this connection it is rather amusing to compare the present parsimony in respect of a great street improvement with the wanton extravagance on steamboats, for instance. The memorialists, of course, want a piece cut off the island site in order to gain a finer architectural vista, but the Improvements Committee assure us that even if a strip 6ft. wide were taken off from Aldwych, tapering away for 255ft., the cost of altering the Strand frontage would be about £35,000 in respect of land alone. The Committee's argument is, that the width of the Strand at this point is now 100ft., while Fleet Street as widened at the eastern end by the City Corporation is only 60ft., and the widened portion of the Strand by the Hotel Cecil only 80ft., and this fact urges the Committee to take still greater refuge in its financial opinion. Moreover, it is not convinced that the architectural effect in the Strand would be improved if the proposal were carried out, and it therefore does not feel justified in recommending the Council to adopt the proposal. Doggedly asserting its original opinion, we suppose now nothing further will be done.

Refinements and Irregularities in Architecture. THE researches which Prof. Goodyear has made in connection with irregularities in medieval churches and cathedrals has led to a revival of interest in the subject, which is certainly of importance to architects. If we dismiss the conclusions arrived at by Prof. Goodyear, on the ground that many of the variations from mathematical exactitude in setting-out and detailing may have been caused by settlement or inability in the workmanship, there remain other examples of deliberate intention (such as Ruskin pointed out in "The Seven Lamps of Architecture") and these cannot be ascribed to any such causes: the only reason we can give for them is that they were refinements introduced by the designer in order to please his sense of fitness. Whether or not he succeeded in effecting an improvement is open to much doubt; indeed, medieval design does not show any strong evidences of success in this direction likely to help modern designers. It is true some of these accidental or intentional irregularities may give an interest to parts of a building, but the modern designer would not care to adopt such methods as those indicated. The argument for the introduction of refinements must be based chiefly upon examples of Classic architecture. In the Renaissance, mathematical exactitude seems generally to have been desired if not obtained. Roman work seems to be regarded as ruder, and unlikely to contain refinements, although Vitruvius makes some remarks abcut curves in horizontal lines in buildings. The exponents of the theory of refinements in ancient architecture lay chief emphasis on Grecian work. It is unquestionable that Greek builders were able to work with very great exactitude, and, reasoning from this, Cockerell, Pennethorne, Penrose and others concluded that the refinements they discovered were the result of some mysterious ingenuity. Regarding them, however, in the light of later knowledge and from a common-sense appreciation of ordinary building operations, it seems fairly plain that any refinements introduced were the result on the one hand of what might be called freehand drawing or modelling in the round, and on the other of traditional methods. Admitting that the Greeks introduced refinements, it is very doubtful whether these were all such decided improvements in the architectural appearance, because the remains of their buildings are so incomplete and have suffered so much from the effects of time that their beauty depends more upon accidental than upon designed effects. If we could see these Greek buildings in their newness they would probably strike us as rather hard and garish. Some of these refinements, such as the convexity of steps and entablatures and other long horizontal lines, undoubtedly correct the optical illusion of sagging, while the entasis on the column may partially have the same effect. The theory of visual correction is, however, insufficient to account for the considerable curvature which was given to the entasis of columns and to horizontal lines. This can easily be overdone, as we often see in modern buildings. The Greek architect undoubtedly looked upon his building with the eye of a sculptor, and his refinements were the result of a difference in the system of designing, whereby he worked in the solid materials rather than upon paper, as we do.

DOORWAYS AND PEDIMENTS

PLATE 7.



THE ORDERS AND THEIR APPLICATION. BY ALFRED W. S. CROSS, M.A., F.R.I.B.A., AND ALAN E. MUNBY, M.A.

PRACTICAL NOTES FOR ARCHITECTURAL DRAUGHTSMEN.

By Alfred W. S. Cross, M.A., F.R.I.B.A. and Alan E. Munby, M.A,

THE ORDERS AND THEIR APPLICATION.

(Continued from p. 223, No. 613.)

Plate VII.

Doorways.

In considering the application of the Orders to doorways, the foregoing general principles regarding proportion must be retained. The scale of the embellishment employed, however, must always be subservient to that of the main composition, otherwise the continuity of the latter will be lost and confusion will result.

The height of the door aperture should never be less than twice its width, and generally a little more. In simple doorways, without columns, the area of the surrounding treatment may be about two-thirds the area of the opening; but where columns are used the former generally considerably exceeds the latter.

An inspection of the plate will show that with single columns the combined width of the two columns and their backing is about equal to the width of the aperture.

Where doors occur in colonnades, the top of the door cornice should range, if possible, with the top of the impost of the arch (if any).

If the columns are brought forward and flanked by pilasters to form a portico, as shown on the left hand of the centre illustration, a more massive treatment is generally advisable than that employed when the columns are engaged.

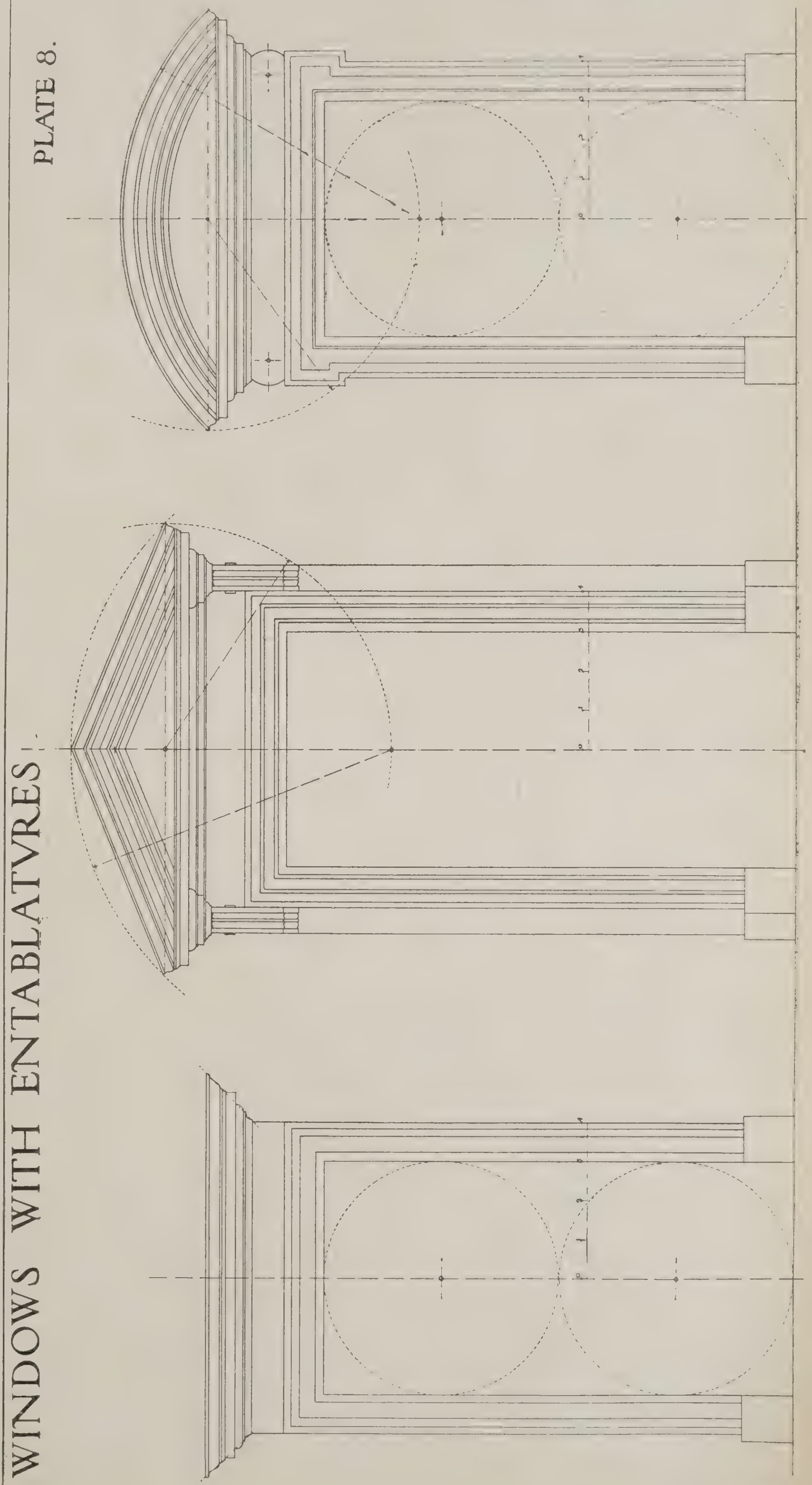
The doorway may be crowned by an entablature terminating in a horizontal cornice, or by a balustrade or pediment, as shown.

As pediments have not been previously referred to, the rules concerning their setting out may be here enumerated.

Rules for Setting Out Pediments.

When a pediment is used, the horizontal members of the entablature above the fillet of the corona are always omitted, except on the horizontal continuation of the cornice beyond the sides of the pediment. As the projection of the cyma is more marked on pediments than on a horizontal cornice it is desirable to use one with a moderate projection where these architectural features are employed. The cyma of the pediment should start from the horizontal fillet above the corona, the termination of which is found in the ordinary course of setting up the Order. All the members of the cornice should be repeated in the pediment, set out normally to the ratio or segment. Modillions and dentils should be set out vertically over those in the horizontal cornice, and their sides should be vertical, and not at right angles to the slope of the pediment. Similarly, the projection of the splay or moulding running round the modillions should be drawn vertically over those in the cornice below, and the rake or segment over each modillion found by connecting the points so obtained with the top of the modillion sides in the pediment. Some distortion of the mouldings at the base of the pediment is unavoidable, but usually, owing to the diminutive nature of the features affected, it is unimportant.

The pediment should be either an unbroken triangle or the segment of a circle. Its height must be correctly proportioned to the span of the composition. The rule for obtaining this height, as given by Gibbs, is shown upon the right and left-hand examples on this plate. A line through the centre of the doorway, at the height of the top of the horizontal cornice, is taken as a centre from which a circle is described, having a radius equal to the distance of the commencement of the rake of the top member of the pediment (as judged). The point at which this circle cuts the centre line of the doorway becomes the new centre from



which a radius, taken to the same point as before, gives an arc the summit of which is the top of the pediment.

Since this rule involves the use of a point which, strictly speaking, cannot be obtained until the rake of the pediment is known, the method given by Chambers seems to be preferable, as being less empiric while it is certainly equally simple. This is shown upon the centre example on the plate. With the whole length of the fillet over the corona as radius, and one end as centre, strike an arc to cut the centre line of the composition. With this point of intersection as the centre, and its distance to one of the extremities of the same fillet as the radius, draw an arc through the pediment. The point at which this arc cuts the centre line is the point of intersection of the *lowest* member of the pediment cornice.

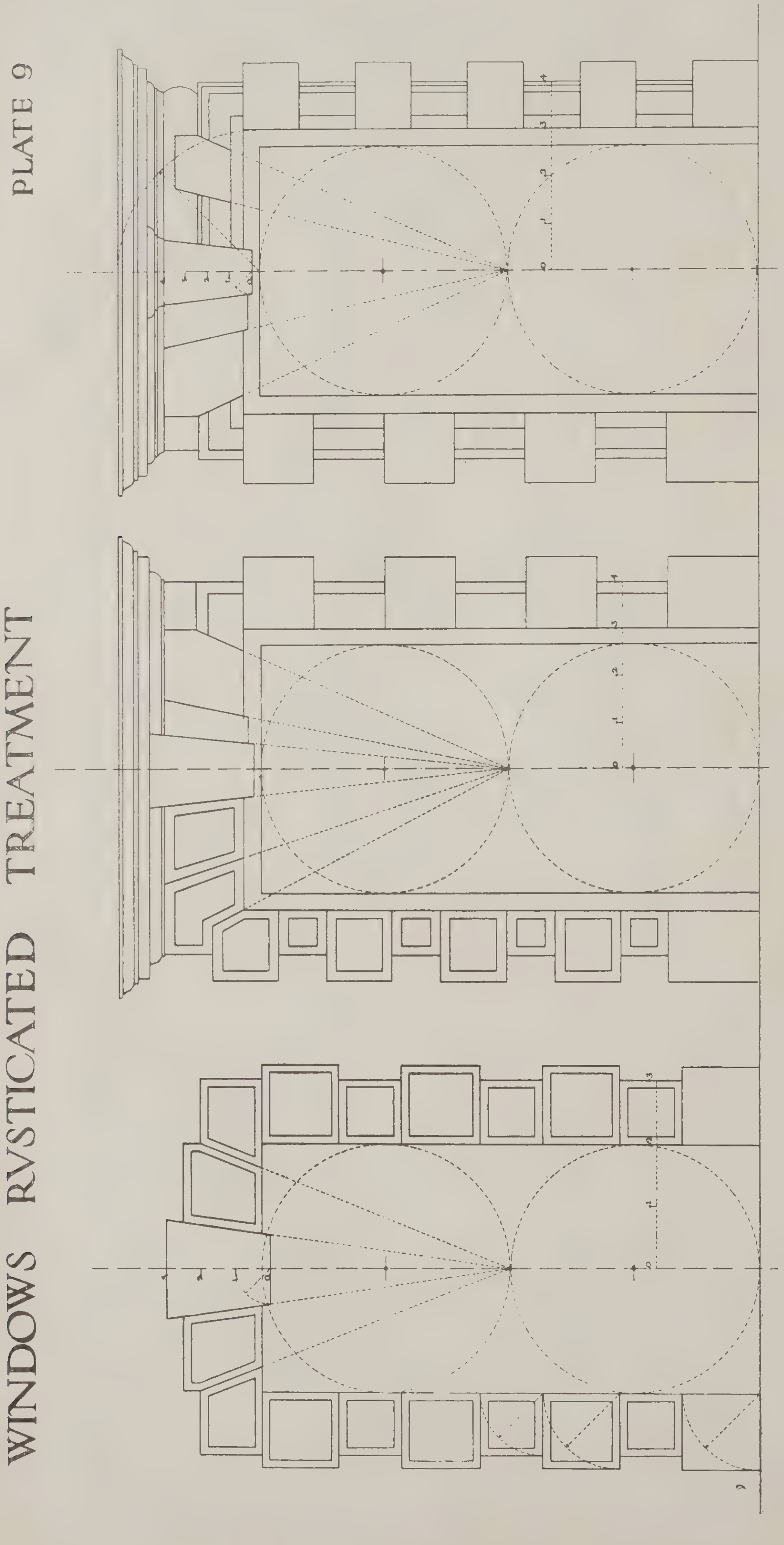


Plate VIII.

Windows and Recesses.

The general remarks made upon doorways apply equally to windows and recesses which may be similarly treated. In the windows shown upon this plate the height of the aperture is twice its width, which gives a good proportion. When an entablature is used its height should be about half, and the architrave one-sixth the width of the aperture. If consoles support the entablature their width should be one-quarter to one-third of their height, and they appear to the best advantage when placed in the positions shown, and in immediate contact with the outer edge of an unbroken architrave. If, owing to circumstances, a window is required of much greater height than twice its width, columns placed on either side will naturally assist in retaining a good proportion and preventing the entablature from appearing too short.

As regards window treatment in general, the centre lines of the openings in successive storeys must, of course, be made to coincide and the same character of dressings maintained throughout any horizontal range of a façade. The distance between the windows should be about 1½ times the width of their apertures, but it may be greater at the angles of the building so as to give strength to the composition. Nothing is so destructive of dignity and repose as excessive variation in the treatment of the fenestration of a building. The study of a few good examples is alone necessary to show the large amount of successful repetition that can be effected in a well-conceived design for one vertical bay of the whole elevation.

Plate IX.

When rustic blocks are used, in place of an architrave, the width of the lower ones should be the same as that of the architrave (about one-sixth the aperture) if an entablature crown the opening. If there be no entablature, as in one of the examples shown upon the drawing, the blocks may be somewhat wider.

The splayed stones at the head of the window have a common centre, as shown upon the plate, and the key block and blocks on either side often project beyond the general face of the dressings. These blocks may further slope forward from the bottom to the top, and can be terminated, with or without mouldings, under the corona of the entablature or above the general line of the horizontal dressings.

Plate X.

This plate shows various window treatments of a simpler character, the ratio of the height to the width of the aperture decreasing until these dimensions are equal, such decrease being generally necessary and often desirable for upper and attic storeys. These windows are often most successful in design when the architrave is broken round them in the manner shown. In this case when an entablature is used the termination of the frieze follows the general line of the architrave.

In the centre of the plate a Venetian window with an arched centre light is shown. The centre opening should be at least twice the width of the side opening, while the breadth of the archivolt should equal the upper diameter of the columns.

Windows of this character are suitable for use as central or occasional features, but they must not occur too frequently in the same façade.

(To be continued.)

INFLUENCE OF MATERIALS ON ARCHITECTURE.

Mr. G. Hartley Goldsmith read a paper on this subject before the students' section of the Manchester Society of Architects last week. Mr. Goldsmith began by pointing out the origin of the Egyptian style from the primitive uses of reed and mud construction. Then, turning to the Greek Doric style, he showed the wooden origin of the entablature and also of the Ionic and Corinthian styles. The Roman style he described as breaking away from trabeated Greek work and developing a new style by means of arch construction combined with the use of concrete. This was carried further in Byzantine times by means of the pendentive dome. The lecturer gave reasons for the origin of the stone vaults which appeared in South France in the Romanesque period, and described how the use of small stones laid in mortar was directly responsible for the development of the Gothic style. Renaissance work he criticised severely, as not being true to the material it used. Modern architecture the lecturer considered to be in a transition stage, architects not realising as yet the full possibilities of steel construction.

Prof. Capper occupied the chair, and afterwards offered some suggestions on points on which the lecturer was rather uncertain.

THE NEW WAR OFFICE.

The Press had an opportunity last week of inspecting the new War Office which has been erected in Whitehall. The building occupies a huge site, and is one of the most important Government buildings completed in London in recent years. The design was originally prepared by the late Mr. William Young in 1899, but it will be recollected that he died before the work was proceeded with very far—before even the foundations were finished. The task of carrying his building to completion was entrusted to Mr. Clyde Young, his son, in conjunction with Sir John Taylor, of H.M. Office of Works.

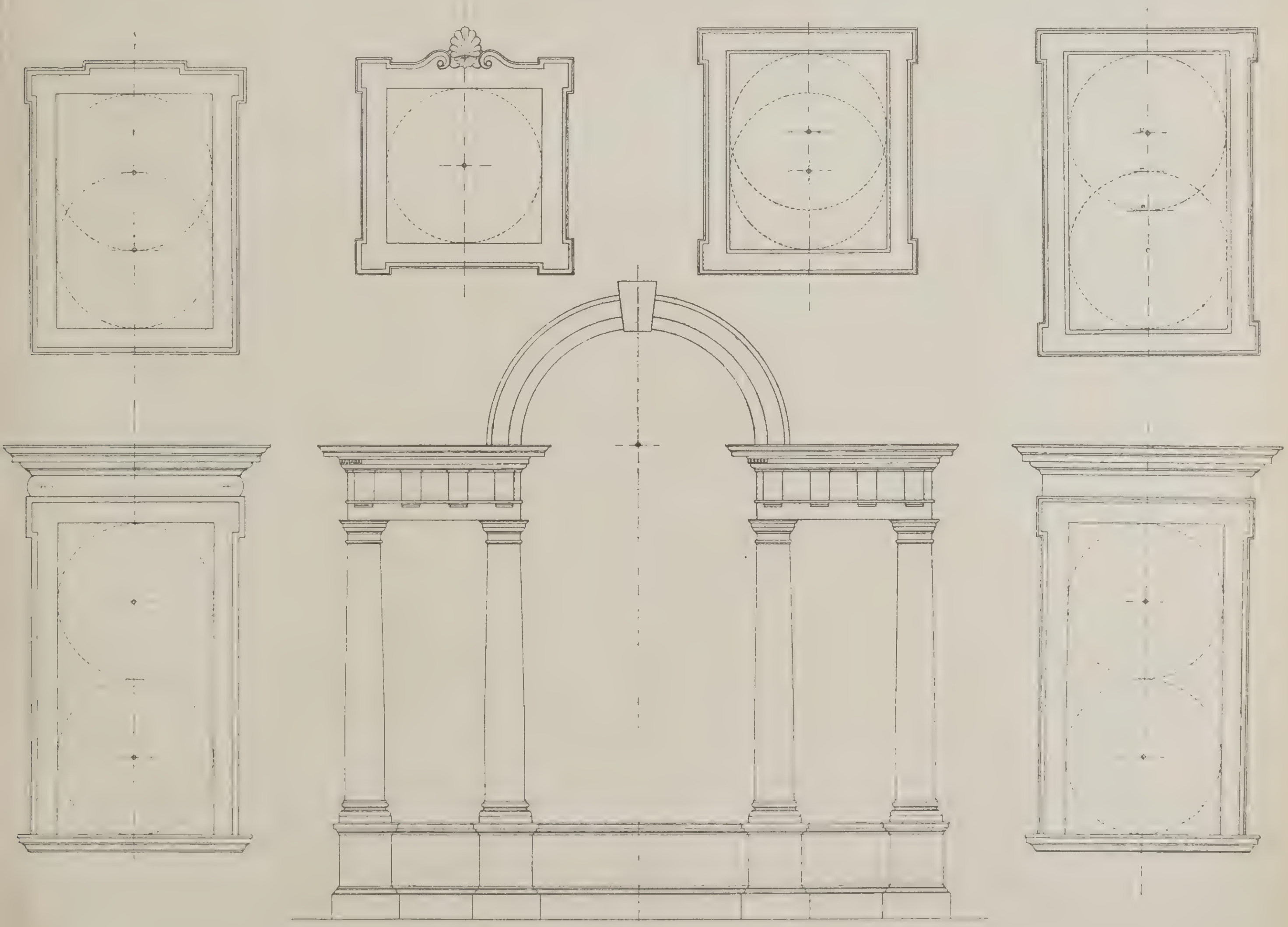
So far as the exterior of the building is concerned, the finest portion in our opinion is the centre portion facing Whitehall, with its colonnade, but we do not care for much of the detail, and it does not strike us that the corner towers are particularly happy in their arrangement. On the curved pediments are sculptured groups by Mr. Alfred Drury, A.R.A., representing Peace, War, Truth and Justice, Fame and Victory.

As regards the interior, undoubtedly the main staircase is the most impressive feature. We publish two views of it as centre plates this week. The general scheme of this staircase, with the main entrance hall, is exceedingly good. The hall is laid with large squares of black and white marble, and on either side are roomy stone fireplaces. The staircase consists of a straight flight leading to a landing, with flights branching right and left to the first floor, where a balustrade and arcading extends around the space. The walls, arches and pilasters are of Painswick stone, with alabaster imposts and balusters, Piastraccia marble steps, and Brescia capping; while at the foot of the stairs are two fine Brescia columns. This staircase has a noble appearance, and the effect is heightened by the manner of lighting with electric lights concealed behind the cornice.

An amazing number of departmental rooms are provided in the building, but they are quite plain and do not call for comment, excepting the rooms on the first floor allotted to the Secretary of State, the Permanent Secretary, the Council of War, &c., which rooms are panelled out in wainscot oak, with enriched plaster ceilings, and fine carved fireplaces embellished with some magnificent marble mantelpieces from the old War Office.

The foundations of the buildings were commenced in 1899 and completed in 1901, being carried down 30ft. below the roadway. The entire site was excavated, and a bed of concrete 6ft. thick laid on the bottom, with side walls of concrete varying from 3ft. to 7ft. in thickness. The erection of the superstructure was

VENETIAN & OTHER WINDOWS PLATE 10.



THE ORDERS AND THEIR APPLICATION. BY ALFRED W. S. CROSS, M.A., F.R.I.B.A., AND ALAN E. MUNBY, M.A.

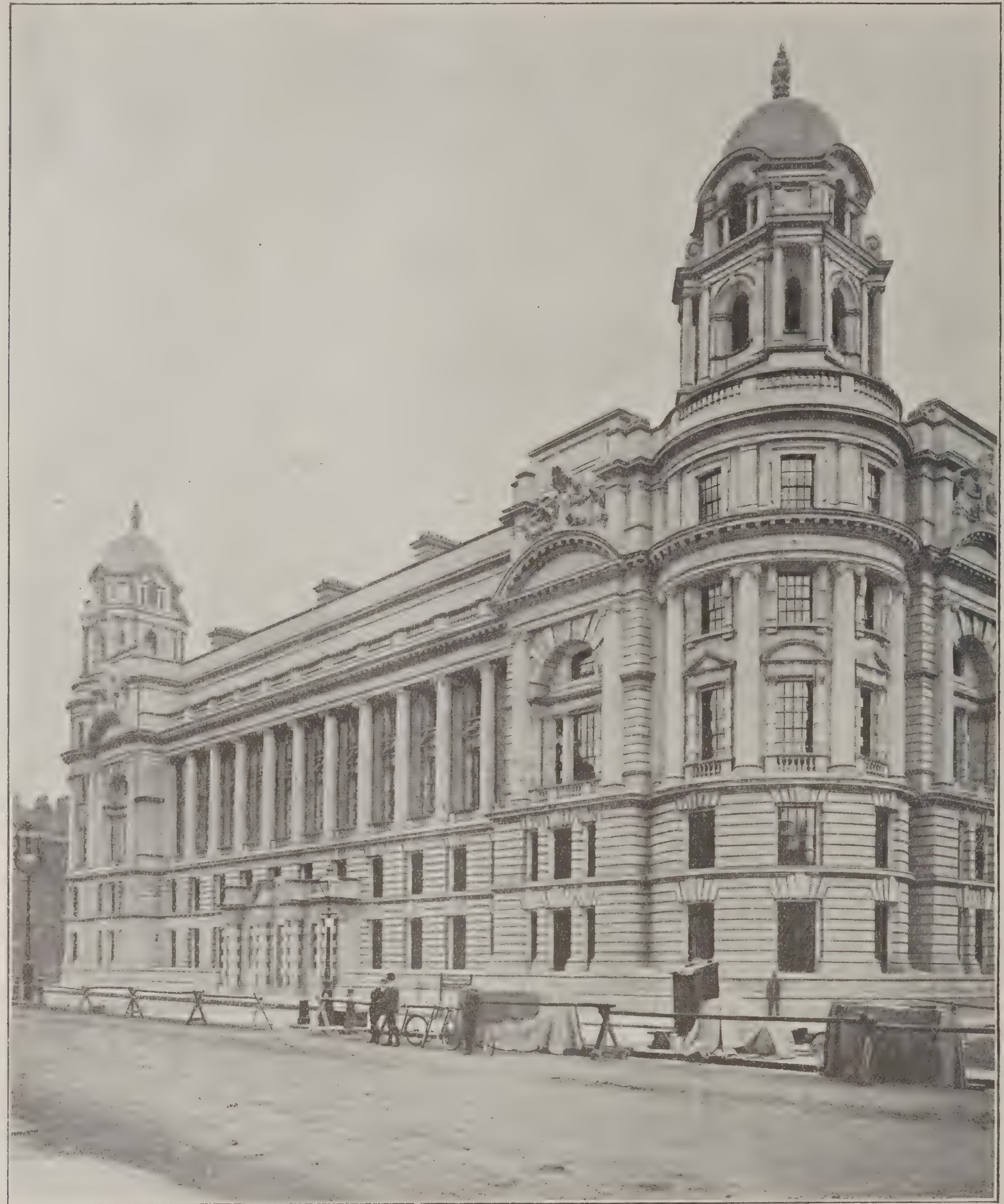


Photo: S. B. Bolas & Co.

THE NEW WAR OFFICE: PRINCIPAL FRONT, TO WHITEHALL. THE LATE WILLIAM YOUNG, F.R.I.B.A., ARCHITECT.

begun in September, 1901, and the building completed this month, well within the contract time, for which achievement great credit is due to the contractors, Messrs. Foster and Dicksee.

The whole of the stone came from the quarries at Portland owned by the Bath Stone Firms, and was specially selected by a Government inspector at Portland before being sent to London, where it was worked in the contractors' yard at Chelsea. For this purpose the most up-to-date machinery was erected, including diamond saws, electric cranes and travellers, the stone being conveyed to Whitehall by motor lorries.

The following particulars of materials used and work done give an idea of the magnitude of the building :—

Bricks (ordinary)	25 millions.
,, (glazed)	$1\frac{1}{2}$ millions.
Portland stone	26,000 tons.
Portland cement	17,000 tons.
York stone	3,000 tons.
Chimney flues	9 miles.
Plaster cornices	17 miles.
Plastering	50 acres.
Steel floor joists	3,500 tons.
Asphalt	7 acres.
Mosaic	18,000 yds.
Glazing	2 acres.

The principal front to Whitehall is 250ft. long, the south front to Horse Guard's Avenue 320ft. long, the east front to Whitehall Avenue 370ft. long, and the north front to Whitehall Place 500ft. long, the height being 80ft.

Within the building are a large quadrangle and a triangular-shaped area faced with glazed white bricks. Below the quadrangle is a hall with massive piers, 25ft. high, to be used as a repository: also the boiler-house, with three large boilers 25ft. long and 7ft. in diameter.

Among the sub-contractors were :—

Plastering.—James Annan, London.
Mosaic paving.—Art Pavements Co., London.
Stoves, chimney-pieces, &c.—Yates, Haywood & Co.
Electric and hydraulic lifts.—Waygood & Co.
Internal wood and stone carving, and marble work, &c.—Farmer & Brindley.
Portland stone.—Bath Stone Firms, Ltd.
Glazed brickwork and "Silex" stone.—Brook & Son, Halifax.
Faïence and wall tiling.—Doulton & Co., Ltd.
Lamp standards.—Coalbrookdale Co.
Floor springs.—Robert Adams, London.
Floor tiling.—J. C. Edwards, Ruabon.
Cement.—Associated Portland Cement Manufacturers, Ltd.

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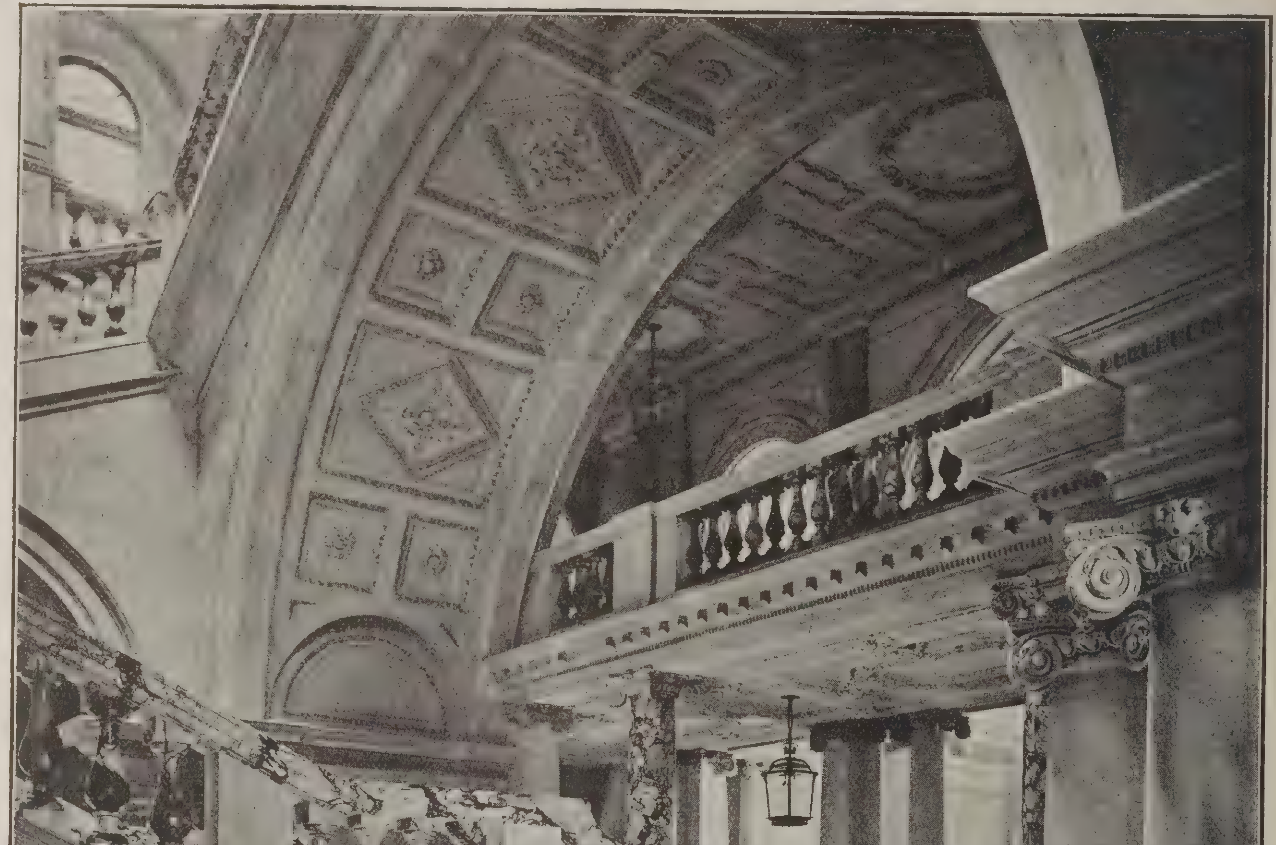
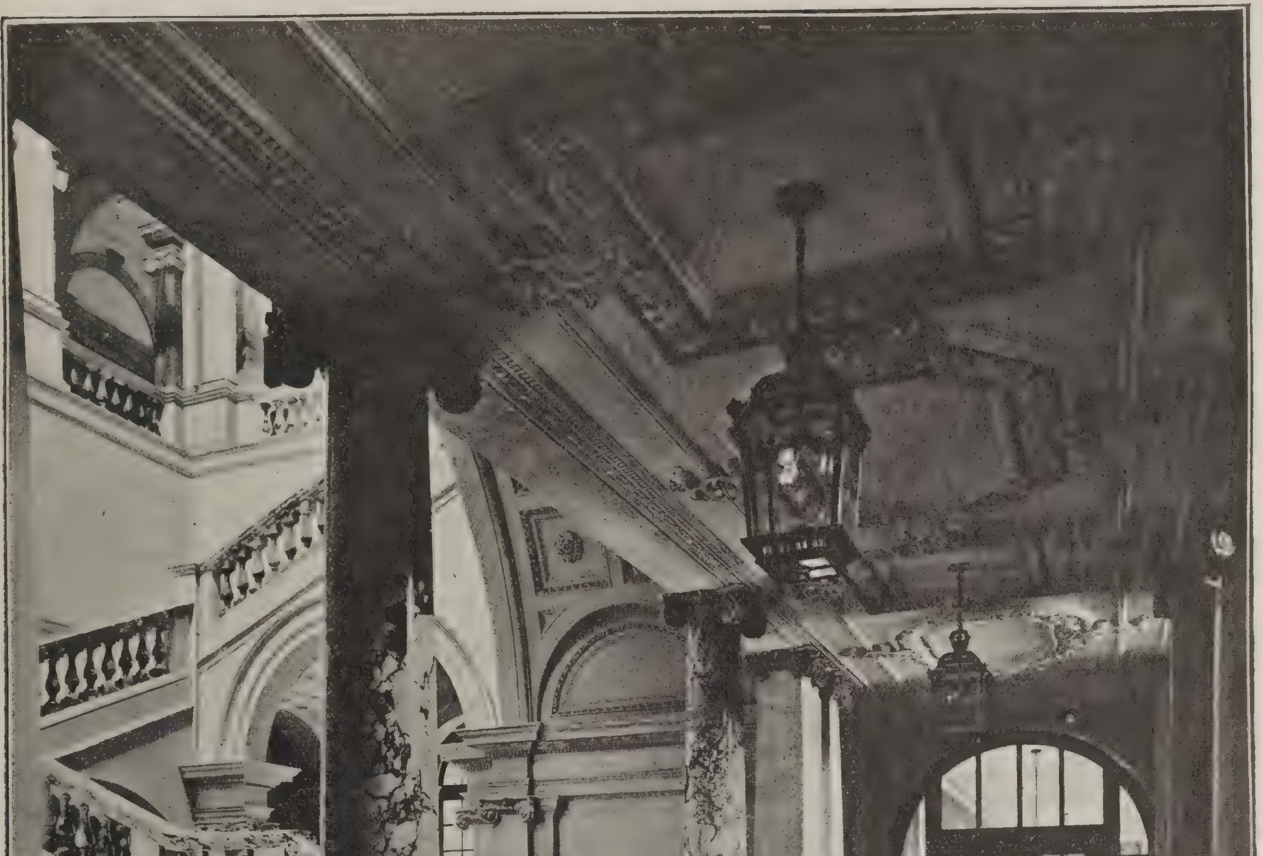
Supplement to
The Builders' Journal and Architectural Engineer,
Wednesday, November 21st, 1906.



THE GRAND STAIRCASE AT THE NEW WAR OFFICE, WHITEHAL



Photos : S. B. Bolas & Co.

ONDON. THE LATE WILLIAM YOUNG, F.R.I.B.A., ARCHITECT.

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EDINBURGH ARCHITECTURAL ASSOCIATION.

President's Address.

The opening meeting of the Edinburgh Architectural Association was held on Wednesday last, when Mr. Hippolyte J. Blanc, R.S.A., president, delivered the inaugural address. After recalling the fact that the Association was founded about fifty years ago, and that, with the exception of the London Architectural Association, it was believed to be the oldest Association of its kind in the British Isles, Mr. Blanc went on to deal with the growth of Edinburgh and the changes that had been wrought within the past half-century. Turning to the future development of the city, he said it should be made a matter of first importance that the main routes should be direct and wide enough for the increasing traffic. Having regard to the irreparably poor appearance of the Morningside Road approach to the city, also of the Dalry and Gorgie Roads, it might be hoped the Corstorphine, Queensferry and Newington approaches might be kept broad, and guarded against the intrusion of anything affecting their present amenity. When the problem of laying out the new town was under consideration, it was prudently determined to submit the whole scheme for the suggestions of architects. The result justified the resolution, and if Edinburgh had nothing else to show than the very successful and dignified classical compositions in the squares and crescents of the "new town," it had enough to justify its claim to be considered a truly classical city. But of architectural character the later city extensions were mostly devoid.

The Princes Street Proposal.

With regard to the proposal to form a terrace or boulevard on the south side of West Princes Street, Mr. Blanc said that very wisely a model had been constructed to enable citizens to judge the effect of it. The proposal, however, had not taken. There was more involved than could be judged from the model. In the West Gardens the gentle fall from Princes Street Walk and the gradually ascending Castle bank opposite, with the broad valley between, formed a unique picture, which could be appreciated only as a whole, not only by the leisurely, but by the ordinary passer-by. To cut off any of the picture, as seen from Princes Street, would destroy it, and the contraction of the valley, by the intrusion of the continuous stretch of terrace wall, as seen from the lower walk, seemed very undesirable. A few feet in addition to the present Princes Street Walk, and a more dignified railing, would be an improvement, and at much less cost.

Restoration of Holyrood Chapel.

The gift of Lord Leven and Melville for preserving and rendering serviceable the old chapel of Holyrood was one that was certain to appeal to the best sentiments of the citizens. Total decay would, within a very limited period, certainly overtake the building if the inestimable opportunity was not now taken to arrest it. If it could be shown that wasting and disrepair could be rectified, and the building could be made serviceable by retaining all it possessed of original material, and by having the gaps filled in, there seemed no reason why that should not be done.

Architecture and Polite Education.

Mr. Blanc maintained that architecture ought to be made a part of a polite education, but if the public had no opportunity either at school or in after life of being properly directed in the study of it, how could an intelligent appreciation of an architect's labours be looked for? The remedy should be found in the infusion of a love for architecture at school. By so sowing the seeds of elementary knowledge, one could look for a new generation qualified to think and act in sympathy with architectural progress.

The secretary, Mr. Colin B. Cownie, intimated that the Council of the Royal Institute of British Architects had arranged to hold their annual meeting in Edinburgh next summer.

R.I.B.A.

The Temple of Artemis at Ephesus.

At the meeting of the Royal Institute of British Architects held on Monday evening at 9, Conduit Street, W.—Mr. H. T. Hare, vice-president, in the chair—a paper on "The Crœsus (6th century B.C.) Temple of Artemis at Ephesus" was read by Mr. A. E. Henderson, Owen Jones student. Mr. Henderson illustrated his remarks with a number of photographs and drawings, without which it is of little use or interest to give an extended report. We have confined ourselves, therefore, to a very brief summary of the paper.

The remains of the temple were uncovered during the British excavations directed by Mr. D. G. Hogarth in 1904-5. The structure was the fourth that had occupied the site, and remains of another, called the "Hellenistic Temple," had been disclosed. The fragments of architecture that had come to light showed that the columns to the peristyle had circular lower bases about 2 metres in diameter, formed of three orders of double astragals separated by two filleted scotias; many varieties of upper or torus bases were found, the most usual type being parabolic in section with horizontal flutings, 3 gave 40, and 3 gave 48, the complete drums of columns were found, but out of 20 fragments 14 gave 44 flutings, 3 gave 40, and 3 gave 48, the last-named being of an entirely new type, the flutings being alternately wide and narrow. As to capitals, enough portions were found to make an entirely new drawing. Mr. Henderson stated that the batter outwards of the volutes was for the optical purpose of counteracting the excessive foreshortening as seen from the ground, and he mentioned that in Hellenistic times the spiral was contracted horizontally and lengthened perpendicularly for the same optical purpose.

At the conclusion of his lecture Mr. Henderson gave his suggested restoration of the temple, his height making the Order work out at about 8 diameters. He made the entablature ¼ of this, the pediment rose another ⅜ths, and with the surmounting acroteria the proportion of superstructure to colonnades was as 3 to 4. The roof, he suggested, was of tiling and timber, which would account for the total destruction of the temple by the arson of Herostratus.

A vote of thanks to the lecturer, proposed by Mr. D. G. Hogarth, and seconded by Prof. Cecil Smith, concluded the meeting.

Notes and News

The Opening of the new Central Criminal Court next month will be a State ceremony, such as characterised the opening of the Law Courts in 1882.

Aberdeen Architectural Association.—At the last meeting of this Association Prof. Hamilton read a paper on "The Origin and Development of Gothic Architecture."

An Exhibition of American Architecture is open up to the end of this month at the Builders' Exchange, High Street, Birmingham. It has been organised by Mr. W. J. Spurrier, and consists of photographs and drawings of Government buildings, "skyscrapers," and other work in the United States, together with views of architectural work in France and Italy.

L.C.C. School of Building, Brixton.—A course of evening lectures and demonstrations in connection with the stone and wood-carving classes at this school was begun on Monday evening. The course is being given by Prof. Beresford Pite, assisted by Mr. S. R. Cameron and Mr. C. Burgess, and will be continued on December 3rd, January 7th and 21st, and February 4th and 16th.

Leeds and Yorkshire Architectural Society The annual general meeting of this Society was held on November 8th, when the secretary read the annual report of the council. Among other things this stated that the School of Architecture under the auspices of the Society, in conjunction with the Leeds Institute and the Leeds University, was proving of great advantage to the Associates in preparing them in the subjects required for the R.I.B.A. examinations.

A very important plastering contract has just been secured by Messrs. Tanner & Son, of Liverpool and London, in connection with the Victoria and Albert Museum, South Kensington, now being erected from the designs of Sir Aston Webb, R.A. With the exception of the walls, practically the whole of the ceilings, including five or six domes—one of which is several feet larger in diameter than the one at St. Paul's—are to be executed in fibrous plaster. In fact, we are informed that this is one of the largest and most elaborate contracts of plaster work ever let in the United Kingdom.

Leadless Glazes.—The Research Committee of the Christian Social Union (London Branch) is holding this week at the Church House, Westminster, an exhibition of chinaware and earthenware finished with leadless glazes. The aim is to show the high standard of beauty attained in the manufacture of leadless glazed ware, and to recommend this ware to public notice on the ground that it secures the operative engaged in manufacturing it from all danger of lead-poisoning. A belief has latterly become current that lead-poisoning no longer occurs in the Potteries. It is an unfounded belief. Despite the good effect of regulation, and the earnest endeavours of employers to safeguard their workpeople against risk, 106 cases of lead-poisoning among pottery workers are recorded in the latest annual report of the Chief Inspector of Factories and workshops. If this serious "disease of occupation" is to be stamped out completely, there must first be a general demand for leadless glazes.

Disfigurement of Buildings through Match Striking.—So much disfigurement has been caused to the granite entrance to the White Star offices in Liverpool that the directors have had large rough metal slabs fixed on either side of the doorway, with a request carved above them that the slabs shall be used instead of the building.

A new Elementary School at Watford has been erected in Parkgate Road at a cost of about £10,000. It accommodates 720 scholars, on two floors. On each floor is a central hall 50ft. by 27ft., on three sides of which are arranged six classrooms, each 24ft. 8ins. by 24ft. 4ins., for 60 scholars in six rows of dual desks. The architect was Mr. Charles P. Ayres, F.S.I., and the contractors were Messrs. the Oak Building Co., Ltd., of Cambridge.

At St. Luke's Church, Walton, the Hornby Memorial Chapel, on the south side of the chancel, has just been completed and consecrated. It is of red brick and stone, and has seating accommodation for about 50 people. Mr. J. Francis Doyle, of Liverpool, was the architect, and Mr. Samuel Webster, of Bootle, the contractor. The chapel is divided from the church by a handsome pair of wrought iron gates, supplied by Messrs. Thomas Elsley, Ltd.

The Warwickshire Reformatory School for Girls has just been completed and opened. The building is planned for the accommodation of 45 girls and 5 officers, and has cost £5,000 (exclusive of furnishing). Mr. Charles M. C. Armstrong, of Warwick, was the architect, and Mr. Charles Hope, of Berkswell, the builder. Sanitary fittings have been supplied by Mr. W. E. Farrer, of Birmingham. A model hand-laundry at the back will form means of support to the institution.

Messrs. Mellowes & Co., Ltd., of Sheffield and London, have appointed Messrs. Acop, Ltd., of 46a, Market Street, Manchester, as their representatives in that city. Messrs. Mellowes have recently secured the order for glazing, on their patent "Eclipse" system, the roofs of extensions to works of Messrs. Thomas Firth & Sons and Messrs. Cammell Laird & Co. at Sheffield, and the Metropolitan Amalgamated Railway Carriage and Wagon Co., Ltd., at Saltley; also new baths and washhouses at South Shields.

British School at Athens.—At the annual meeting of subscribers, held in London recently, it was stated that next session it was hoped to excavate the site of the Temple of Artemis completely. For this undertaking and for carrying on the work in Laconia £1,500 will be needed. Prof. R. C. Bosanquet described the work of the school during the past year, his remarks being illustrated by a series of lantern views of the work of the students in different fields, and in greater detail the unique finds made at the beginning of the excavations on the site of the Temple of Artemis Orthia at Sparta.

Two Cottage Hospitals.—The new cottage hospital at Moffat was opened recently. The building is one storey high, with attics, and will be used for non-infectious cases only. There are two large wards occupying the south front, with matron's room between; while on the west is a small private ward; in addition to which the usual appurtenant rooms are provided. Mr. Edward C. H. Maidman, of Edinburgh, was the architect. Mr. Maidman was also the architect of the new cottage hospital at Crieff, recently completed at a cost of £1,500. The accommodation here is very much the same as at Moffatt.

SOCIETY OF ARCHITECTS.

President's Address.

The opening meeting of the session of the Society of Architects was held on Thursday evening last at Staple Inn Buildings, when the president, Mr. A. E. Pridmore, delivered his inaugural address. At the outset, while noting with gratification the rapid growth of their membership, he urged that they should be to a much greater degree representative of those whose interests they sought to serve. They should form some comprehensive scheme with this end in view, holding to the principle of the Registration Bill which they were promoting. "My proposal is that, pending statutory registration, we should take steps to enlarge our borders as to become, by force of numbers,

the recognised registering body of the profession.

I hope my remarks may not be misconstrued; my meaning is that, whilst our council should continue to exercise due vigilance and discretion as in the past in admitting members, we ought also to use every legitimate means in our power to extend our membership."

The Society of Architects had outgrown the expectation of its original promoters, and the time had arrived for them to seriously consider the desirability of making an application for a charter; and he expressed the hope that at no distant date it might be placed among the Royal Societies of the United Kingdom.

Proceeding to deal with registration, Mr. Pridmore said the opposition was from within the profession, and confined principally to questions of detail. It was satisfactory to feel, however, that much of the old misunderstanding had been lived down, and there now appeared to be every prospect of further favourable development in the future. Meanwhile, it only remained for them to go on with their Bill.

Speaking of the practice of architecture, Mr. Pridmore observed that the profession was overcrowded to such a degree that many able men found it extremely difficult to make a living, and he strongly advised parents and guardians to think twice before launching their sons and daughters into it.

Continuing, the president made appeal for funds on behalf of the Architects' Benevolent Society, and then went on to emphasise the necessity for the architect to keep himself abreast of the times in regard to the latest details of construction and materials, important legal decisions, and other matters.

Salaried Officials in Private Practice.

Dealing with this matter, Mr. Pridmore said the grievance was aggravated where a local authority placed its architectural work in the hands of an official whose training had not been in any sense architectural. "In such cases the local authorities endeavour to appeal to the ratepayers, as against the architects, on the ground of an apparent saving in the rates in having no outside architect's fees to pay, whereas, as a matter of fact, it is very often the case that the building is found to have cost a great deal more than would have been the case by employing an outside architect. . . . The bitter cry of the architect is heard not only in England, but in Ireland, where, however, steps have been taken in the right direction by the insertion of a clause in the Labourers' Act which prevents the employment of an unqualified person as architect for the purposes of the Act."

Other matters referred to by the president in his address were—the recent decision of the House of Lords in *Kine v. Jolly*, the fire at Selby Abbey, London street improvements, and municipal art control.

BIRMINGHAM MASTER-BUILDERS' ASSOCIATION.

At the annual meeting, held last week (Mr. J. B. Whitehouse, president, in the chair), the committee's report for the year ended October 31st was presented. It stated that, although there had been increased activity in some of the manufacturing trades in Birmingham, the looked-for improvement in the building trade was not yet apparent. Employment throughout the year had continued dull. With regard to the establishment of conciliation boards, a local board had been formed during the year, and was now in working order so far as carpenters, bricklayers and masons were concerned, and it was hoped that during the ensuing year the remaining branches of the trade, not at present parties to the agreement, would come into line. It had been decided by the committee not to give notices for any alterations in the working rules with the operatives this year.

The president, in moving the adoption of the report, said

the outlook for the building trade

was very serious, but he trusted they might have a speedy return to good trade; he was bound to say, however, he could not see any material signs to build optimistic hopes upon. But he pointed out that matters might be improved if the trade unions would only educate their members up to a right and proper feeling in the matter of output, for it was an undoubted fact that during the past twenty years the amount of work done per day had decreased from 30 to 50 per cent.

Speaking of the Trades Disputes Bill, which had now passed third reading in the House of Commons, Mr. Whitehouse said he trusted the powers given would not in any way tend to lessen the good work which had been commenced by the establishment of the conciliation boards. As regards

the Workmen's Compensation Act,

it was clear that this needed much amendment: the present law was so incomplete, so full of defects and so badly drawn that neither masters nor men were secure under its provisions: it had been rightly termed the Lawyers' Compensation Act. What was required was a Bill containing clauses of compulsory and national insurance. Under national insurance it would not matter whether the workman was in the employ of a sub-contractor, chief contractor, or an undertaker; he would be entitled to compensation by law, and would be able to receive it without having deductions in respect of litigation.

The annual dinner of the Association was held in the evening.

Notes on Competitions

Baths at Birmingham.

The Birmingham City Council has decided to invite competitive designs for the new baths to be built in Nechells Park Road, but there will not be any open competition, as the designs are to be invited from certain selected architects.

Elementary School, Slough.

In connection with this competition a "form for architects" is issued by the Bucks Education Committee. By signing this the competitor "begs to offer his services as architect" at an inclusive fee of —— per cent. Comment is needless. But no self-respecting architect will bargain in this unprofessional manner.

An Essay Competition.

The council of the Institution of Heating and Ventilating Engineers has instituted a competition for the best paper dealing with some branch of heating and ventilation work. There is no precise branch stipulated, but the following are suggested as being suitable:—

"Heating plants in private houses,"
"Heating and ventilation of churches or halls with and without mechanical means,"
"The disposition of heating surfaces in various classes of buildings,"
"On the determination of the sizes of flow and return hot-water mains, or steam and condensed mains."

The competition is open to anyone in the British Isles, except the principal of a firm, and the prizes offered are:—1st, ten guineas; 2nd, five guineas; 3rd, two guineas. Further particulars can be obtained from the secretary of the Institution, 99, Fonthill Road, Finsbury Park, N.

List of Competitions Open.

Deposit for conditions given where known.

DATE OF DELIVERY	COMPETITION.
Nov. 30	LIBRARY AT NEWTON-IN-MAKERFIELD.—Cost £4,000. Particulars from C. Cole, clerk to U.D.C., Town Hall, Earlestown, Lancs. No deposit.
Dec. 12	LAY-OUT OF RIDDRIE ESTATE, GLASGOW.—Premiums of £75, £50 and £25. Particulars from A. W. Myles, town clerk, City Chambers, Glasgow. No deposit.
Dec. 31	LABOURERS' COTTAGES AT DUBLIN.—Premiums of £50, £30 and £20. Particulars from A. R. Barlas, secretary, L.G.B. Offices, Dublin.
Dec. 31	DUAL SECONDARY SCHOOL AT GOOLE.—Premiums £50 and £25. Particulars from James W. Johnson, clerk to Governors, Council Offices, Goole. Deposit £2 2s.
Dec. 31	NURSES' HOME AT GENERAL HOSPITAL, WOLVERHAMPTON.—Particulars from J. Stephen Neil, House Governor and Secretary, General Hospital, Wolverhampton. No deposit.
Dec. 31	BATHS AT ASHTON-IN-MAKERFIELD.—Limited to architects in Wigan and Leigh Poor Law Unions. Particulars from A. Sykes, clerk, Council Offices, Ashton-in-Makerfield. No deposit.
1907 Jan. 19	LIBRARY AT PLYMOUTH.—Premiums £50, £30 and £20. MUSEUM AND ART GALLERY AT PLYMOUTH. Premiums £25, £20 and £10. Limited to local architects. Particulars from Borough Librarian, Plymouth.
Feb. 1	CHILDREN'S HOSPITAL AT SUNDERLAND.—Premiums of £100, £50 and £25. Particulars from T. Robinson, secretary, Infirmary Offices, Bank Buildings, Sunderland. Deposit £1 1s.
No date.	ELEMENTARY SCHOOL AT SLOUGH, for 600 children.—Limited to local architects. Particulars from C. G. Watkins, Education Secretary, Education Offices, Aylesbury, to whom applications must be sent by Nov. 30th.

Enquiries Answered.

Tramcar Construction.

MATLOCK.—DIMPLE writes: "Is there any periodical on tramcar construction, both as regards bodies and motors and braking gear?"

"The Electric Tramcar Handbook," published by Alabaster, Gatehouse and Co., 4, Ludgate Hill, E.C., price 2s. 6d. nett, deals with these subjects in a very practical and lucid manner. A paper on "Car Brakes," by Henry Mozley, read at the conference of the Municipal Tramways Association at Leeds on September 20th last, with the discussion thereon, gives much up-to-date information about brakes. H. S.

Kempe's Stained Glass.

EAST YORKSHIRE writes: "In what churches are the best specimens of Kempe's stained glass to be found?—preferably a church where all the windows are by the same artist."

St. Ethelburga, Bishopsgate: East window. *Folkestone Parish Church:* West window (these are, I believe, two of Mr. Kempe's earliest works, and very interesting, 1873-74). *St. Saviour's, Southwark:* Series in nave aisles; north and south transept windows (the southern "Jesse" is particularly fine); eastern triplet in choir; Charles I. and Landseer door at north-east angle of retrochoir; the great east window is among the artist's happiest efforts. *St. Agnes's, Kennington Park:* All, I believe. *St. John the Divine, Vassal Road, S.E.:* Nave. *St. Alban's, Holborn:* MacKonochie Chapel. *St. Paul's Cathedral:* Lower windows of apse; one in west aisle, north transept. *St. Peter's, London Docks:* Eastern rose and lancet on either side. *St. Mary's Cathedral, Edinburgh:* Series. *Solihull Church, Warwickshire:* West end, a "Jesse." *Burford Church, Oxon.:* West window. *Lichfield Cathedral:* Great Late Perpendicular window of south transept; series in chapter-house; the finest is the east window, with figures of St. Thomas of Hereford and Higebriht. *Gloucester Cathedral:* Window in north aisle of choir opposite Edward II.'s tomb; designed by the late Mr. Sedding. *Wakefield Cathedral:* Nave aisles and recently added portions. *York Minster:* East aisle of north transept; two lancets each containing a golden figure on grisaille, copied from some adjacent old glass. *Chichester Cathedral:* Eastern triplet of choir; window at east end of south choir aisle. *St. Mary's, Oxford:* West window. *Leighton Buzzard, Beds:* Clearstory. *Church at Hoar Cross, Staffs.:* One of Mr. Bodley's most sumptuous works. I believe most of the work here is Mr. Kempe's. T. FRANCIS BUMPUS.

Obituary

Mr. James Beaumont, builder, Kirkley, died last week, aged 63.

Mr. William Stark, builder, Westcliff-on-Sea, who died on October 7th, left estate which has been proved at £61,503 gross.

The late Mr. John Wright, builder, of Nottingham, who died on April 27th, 1905, left estate which has been proved at £68,037 gross.

Views and Reviews.

Baths and Washhouses.

It is a curious fact that there are several classes of buildings which have not been treated comprehensively in any book—town halls and baths, for example. With regard to the latter, however, Mr. Cross aims at filling the requirement with the volume now before us. The book is admirably produced (as Mr. Batsford's books always are) and deals with all matters of design and arrangement. Numerous illustrations are given of much interest, but we think the book would have been of still greater use if more buildings had been represented. After an introductory chapter, the author goes on to deal with his subject under different heads—such as swimming baths, slipper baths, hot water and steam services, &c., and in this way he furnishes a mass of information of practical use. Moreover, he has adopted the method in some cases of giving portions of plans to elucidate certain points, which is an excellent method. At the end of the book are given appendices relating to the Baths and Washhouses Act, and London County Council requirements. Being the only up-to-date treatise on a subject which has made considerable strides in recent years, Mr. Cross's book is sure to be welcomed.

"Public Baths and Washhouses" by Alfred W. S. Cross, M.A., F.R.I.B.A. London: B. T, Batsford, price 21/- nett.

Trade and Craft.

Masonry.

Undoubtedly the difficulty of obtaining prompt and satisfactory supply has been of great influence in the restriction of the use of stone for the structure of modern buildings, which even when of an important character frequently reduce stonework to a minimum. Firms able to supply large quantities of any required description of granite, stone, marble and slate satisfactorily as to quality, delivery and price, and willing to meet the chief contractors in every way, are few and far between. Messrs. J. Hodson & Son, Ltd., whose head office is at Nottingham, are one of these firms. Although as a general rule no canvassing is done by them, Messrs. Hodson make a point of being ready to send an experienced representative immediately if requested by telephone or wire to give prices and particulars, and the work will be placed in hand the same day if the contract is urgent. This plan is found advantageous, especially in London, where despatch is everything, and in the case of such occurrences (fortunately infrequent) as the re-erection of the bridge wrecked at Grantham in the recent railway accident, the stonework for which was carried out by Messrs. Hodson in a remarkably short time. Among the works in hand and recently completed by this firm may be mentioned the Central Fire Station, Croydon; new Shire Hall, Nottingham; new schools at Nottingham, Maldon, Bushey, &c.; additions to Cheddleton Asylum; Manor Gardens Library, Islington; additions to St. John's Road Workhouse, Islington; new factories and warehouses at Long Eaton, Draycott, Borrowash, and Derby.

Complete List of Contracts Open.

WITH a few exceptions, news of Contracts Open are not repeated after they have been published once in these columns, so that readers will find particulars in our previous issues of other contracts that still remain open.

Unless expressly stated to the contrary, all deposits required for bills of quantities, &c., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair-wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

Nov. 22. Barncoose.—*Erection and completion* of proposed houses at Barncoose, for Mr. R. J. Hattam, according to plans and specification, which may be seen by appointment at his residence, Lynwood, Barncoose, Illogan, or at the office of S. Hill, architect, Green Lane, Redruth, from whom all particulars relating to the work may be obtained. Sealed endorsed tenders are to be sent to the proprietor on or before Nov. 22.

Nov. 22. Hull.—*Erection of new buildings* for the Sutton, Southcoates and Drypool Gas Co., at their works, St. Mark Street, Groves, Hull—*i.e.*, Contract No. 1.—Meter testing shop and stores. Contract No. 2.—Chemical laboratory stores, and workmen's lavatories. Persons desirous of tendering can see plans and specifications, and obtain copies of bills of quantities, at the engineer's office, St. Mark Street, Hull. Sealed tenders, addressed to D. Wood, secretary, to be delivered on or before 10 a.m. on Nov. 22.

Nov. 23. Heavitree.—*Erection of a new boundary wall, &c.*, at the site of the New Council School, Ladysmith Road, Heavitree. The plan and specification can be seen, and forms of tender obtained, at the architect's office between 9.30 a.m. and 5.30 p.m. (Saturdays, 9.30 to 1 p.m.). Tenders, written on the above-mentioned form, must reach the architect, 1, Richmond Road, Exeter, not later than the first post on Nov. 23.

Nov. 23. Hingham.—*Reconstruction of the sanitary offices* and other improvements at Hingham school, and for the enlargement and improvement of Wendling school. Builders desirous of tendering should send in their names not later than Nov. 12 to the office of the Norfolk Education Committee, 57, London Street, Norwich, at which office plans and specifications can be inspected, and bills of quantities obtained on and after Nov. 16. Tenders must be delivered by 12 noon on Nov. 23, addressed to "The Secretary, Norfolk Education Committee, 57, London Street, Norwich," and endorsed "Tender for Hingham School, or Wendling School."

Nov. 26. Littlehampton.—*Construction of a screening chamber* and other works, in connection with the drainage of the workhouse at East Preston. Plan and specification can be seen on application to H. M. Potter, architect, Worthing. Sealed tenders to be sent to A. Shelley, clerk, Littlehampton, not later than Nov. 26.

Nov. 26. Accrington.—*Erection of an engine and boiler house* at Altham Bridge. Plans may be seen at the offices of Haywood & Harrison, architects, Accrington, and bills of quantities obtained from them on payment of £2 2s. Tenders, endorsed "Altham Bridge Pumping Station," to be sent to A. H. Aitken, clerk of the Board, Town Hall, Accrington, on or before Nov. 26.

Nov. 28. Glasgow.—*Alterations to the Northern, Western and Southern Police Offices*, for the Corporation of Glasgow. Specifications and forms of tender may be had on application at the Office of Public Works, City Chambers, 64, Cochrane Street. Sealed tenders, marked outside, "Tender for Alterations, Police Offices," must be lodged with A. W. Myles, town clerk, City Chambers, Glasgow, not later than Nov. 28.

Nov. 28. London, N.—*Erection of an Infirmary* for fifty beds at the Chase Farm Schools, The Ridgeway, Enfield, N., for the Guardians of the Edmonton Union. Drawings and specifications of the proposed work may be seen at the offices of S. Hill, architect, 106, Cannon Street, E.C., and bills of quantities had on payment of £5 5s. (cheque). Sealed tenders to be delivered to F. Shelton, clerk, Lower Tottenham, on or before 9 a.m. Nov. 28.

Nov. 30. Ystrad Mynach.—*Erection of a proposed hotel* at Ystrad Mynach for Messrs. D. Williams & Co., Taff Vale Brewery, Merthyr Tydfil. Plans, specifications, and bills of quantities may be seen at the above address, or at the office of R. Edwards, architect and surveyor, Brynheulog, Treharris. Builders desiring to tender must send in their names to the architect, together with a deposit of £2 2s., when bills of quantities, form of tender, and particulars will be forwarded. Sealed tenders to be sent to W. Griffiths, D. Williams & Co., Taff Vale Brewery, Merthyr Tydfil, endorsed "Tender for Erection of Halfway House Hotel," on or before Nov. 30.

Nov. 30. Ashford.—*Widening of the bridge* over the ditch, Beaver Road, near the Sewage Pumping Station, for the U.D.C., in accordance with the plan and specification, which may be seen on application to W. Terrill, surveyor, North Street, Ashford, Kent. Sealed tenders, endorsed "Bridge Widening," to be sent to J. Creery, solicitor, clerk, 11, Bank Street, not later than 5 p.m. on Nov. 30.

Dec. 1. Bangor.—*Extensive additions and improvements* to the Criterion Hotel, Bangor, Co. Down. Plans and specifications relating to the work may be seen of J. V. Brennan, C.E., architect, Belfast Bank Chambers, Belfast. Sealed and endorsed tenders to be lodged with him on or before Dec. 1.

Dec 3. Wakefield.—*Repairs to Ferrybridge Bridge*, situate on the Doncaster and Tadcaster main road, within the rural district of Pontefract. General conditions, specification, and bill of quantities can be obtained at the office of the West Riding Surveyor, County Hall, Wakefield, on the deposit of £1. Cheques, &c., should be sent to the West Riding Treasurer, at the County Hall, Wakefield. Sealed tenders, duly endorsed, to be delivered at the office of F. G. Carpenter, West Riding surveyor, County Hall, Wakefield, not later than Dec. 3.

Dec. 3. Blackburn.—*Erection of extensions to* Accrington Road Council school, to accommodate 300 children, for the Blackburn B.C. Plans and specifications may be seen and bills of quantities and forms of tender obtained at the office of Cheers & Smith, architects, 24, Richmond Terrace, Blackburn, on payment of £2 2s. Sealed tenders, on forms supplied, endorsed "Accrington Road Extensions," to be sent to A. Gow, director, Education Office, Library Street, Blackburn, on or before Dec. 3.

Dec. 3. Cove, Kincardineshire.—*Construction of new station buildings* at Cove, Kincardineshire, for the directors of the Caledonian Railway Co. The drawings may be seen at the office of the Company's Engineer, Buchanan Street Station, Glasgow, or at the office of the Company's District Engineer, General Station, Perth, where copies of the specification and schedule may be obtained on payment of £2 2s. Sealed tenders, endorsed "Tender for Reconstruction of Cove Station Buildings," to be lodged with J. Blackburn, secretary, Caledonian Railway Company's offices, 302, Buchanan Street, Glasgow, on or before Dec. 3.

Dec. 3. Boston.—*Converting part of the Fish Market* into a lavatory, &c., and converting the old Police Station into a shop. Plans and specifications can be seen at the office of G. E. Clarke, Ass.M.I.C.E., borough surveyor, where forms of tender can be obtained. Tenders to be sent to M. Staniland, town clerk, Municipal Buildings, Boston, on or before Dec. 3, marked "Tender for Lavatories and Shop."

Dec. 3. Strabane and Letterkenny.—*Construction of passenger and goods stations* along this line for the Directors of the Strabane and Letterkenny Ry. Co. The drawings, specifications, and measurers' quantities may be seen at the office of J. Barton, engineer, Exchange Buildings, Dundalk. Tenders must be sent upon the form which will be supplied to intending contractors, and must be with J. Gillespie, secretary of the company, Londonderry, on or before Dec. 3.

Dec. 3. Dublin.—*Erection of a stores building* (two storeys) in brick, 181ft. long by 50ft. wide, with steel principal roof and steel girder supported floor, also offices, 34ft. long, making a total length of block 215ft., at their Dundalk Station, for the Great Northern Railway Co. (Ireland). Parties wishing to tender may see the drawings and specification at the office of W. H. Mills, engineer-in-chief, Amiens Street, Dublin, or copies of them at the office of the District Engineer, Belfast, and can obtain at the said offices lithographed copies of the eight drawings and specification and form of tender on payment of £2 2s. (not returnable) per set. Quantities are not supplied. Tenders for the brickwork, or steelwork, or for the whole of the work, to be made out on the forms supplied by the Company, and endorsed "Tender for Stores Building," should be delivered to T. Morrison, secretary, Secretary's Office, Amiens Street Terminus, Dublin, not later than 10 a.m. on Dec. 3.

Dec. 5. Manchester.—*Erection of the Beaver Road Municipal School*, Didsbury, Manchester. Plans may be seen, and a copy of the bills of quantities (including specification) obtained, at the Education Offices, Deansgate, Manchester, on a deposit of £2 2s. Tenders, on the official forms, and enclosed in the envelopes provided, must be delivered not later than Dec. 5. Cheques to be made payable to the Accountant, Education Offices, Deansgate, Manchester.

Dec. 6. London, N.E.—*Erection of an additional Nurses' Home* at their Infirmary, Whipps Cross Road, Leytonstone, N.E., for the West Ham Union. The drawings and specification prepared by R. Banks-Martin, M.S.A., architect, may be inspected at 121, Plashet Grove, East Ham, E., between the hours of 10 a.m. and 4 p.m. Forms upon which tenders must be made, together with a copy of the bill of quantities, can be obtained of F. E. Hilleary, clerk, Clerk's Office, Union Workhouse, Leytonstone, N.E., on payment of a deposit of £20. Fair wages clause. Tenders, sealed and endorsed, must be delivered to the clerk not later than Dec. 6, at 10 a.m.

ENGINEERING.

Nov. 27. Kingston-by-Sea.—*Supply and fitting* up of a washing machine and Deconden ironing machine for the Guardians of the Steyning Union in their laundry, at the New Workhouse, Kingston-by-Sea, the latter in lieu of the machine at present in use, and for which the Guardians invite an offer for purchase. Particulars and specifications of the work required can be obtained on application to E. Cripps, clerk to the Guardians, Union Offices, New Shoreham, Sussex. Tenders to be sent so that they reach him not later than 9 a.m. on Nov. 27.

Nov. 30. Aberdare.—*Heating apparatus* for the Higher Standard Schools, for the U.D.C. Education Committee. Plans and specifications may be seen at the office of J. Morris, director, Town Hall, Aberdare, or of T. Roderick, architect, Clifton Street, Aberdare. Tenders, with full particulars of scheme, to be sent to Mr. Morris, duly endorsed "Tender for Heating Apparatus," on or before Nov. 30.

Nov. 30. Ashford.—*Widening of the bridge* over the ditch, Beaver Road, near the sewage pumping station, for the U.D.C., in accordance with the plan and specification, which may be seen on application to W. Terrill, surveyor, at his office, North Street, Ashford, Kent. Sealed tenders, endorsed "Bridge Widening," to be sent to J. Creery, solicitor, clerk, 11, Bank Street, not later than 5 p.m. on Nov. 30.

Nov. 30. Sunderland.—*Supply of four* 350 KW. *rotary converters*, static transformers, and high tension switchgear for the same, for the Corporation. The specification and form of tender can be obtained on application to J. F. C. Snell, M.I.C.E., borough electrical engineer, Town Hall, Sunderland, on payment of a deposit of £1 1s. Sealed tenders, addressed to the Chairman of the Electricity and Lighting Committee, Town Hall, Sunderland, must be delivered not later than 12 noon on Nov. 30. Tenders to be endorsed "Rotary Converters."

Dec. 6. London, S.E.—1. *The removal of two externally fired boilers* and one externally fired water-heater, and the supply and erection of two Cornish boilers, steam and feed pipes, pump, hotwell, calorifier, &c., and 2. For the boiler, seatings, flues, building alterations, &c., at the St. George's Workhouse, Mint Street, Borough, S.E., for the Guardians of the Southwark Union, as set forth and described in the specifications and drawings referred to therein, prepared by the Guardians' consulting engineers, the National Boiler and General Insurance Company, Limited, 22, St. Ann's Square, Manchester, from whom copies of the drawings and specifications, with conditions attached, may be obtained on payment of a deposit of £2 2s. Tenders, endorsed "Boilers—St. George's Workhouse," should be addressed to the Guardians, and delivered at Union Offices, John Street West, Blackfriars Road, S.E., by 4 p.m. on Dec. 6., when the tenders will be opened. Fair wages clause.

Dec. 10. Newtownards.—*Construction of a complete system* of waterworks for Newtownards for the U.D.C. The works comprise generally, the driving of about 1,500 yards of tunnel through Scrabo Hill, the construction of a concrete reservoir of 2,000,000 gallons capacity in the Townland of Ballycullen, the laying of an aqueduct and the various distributing pipes throughout the town, consisting of about 16,800 yards of cast-iron pipes, varying in diameter from 10ins. to 3ins., with the supply and fixing of all pipes, valves, meters, hydrants, specials, &c., the construction of a concrete reservoir of 100,000 gallons capacity, in the Townland of Corporation North, and the providing and fixing of pumping engines with all necessary fittings. Plans and specifications may be seen, and a copy of the specification, form of tender and bill of quantities can be obtained upon payment of £1 1s. (which will not be returned) at the office of Swiney & Croasdale, MM.Inst.C.E., engineers, Avenue Chambers, Belfast, on any week day between 10 a.m. and 5 p.m., except on Saturday, when the office closes at 2 p.m. Tenders, endorsed "Tender for Waterworks," to be delivered in sealed envelopes at the office of H. McCartney, clerk to the U.D.C., Town Hall, Newtownards, Co. Down, Ireland, not later than 5 o'clock on Dec. 10.

Dec. 12. Handsworth.—*Supply and delivery* of Contract No. 14.—Permanent way reconstruction and overhead equipment, in connection with the Birchfield Road tramways, for the Handsworth U.D.C. Copies of the specification, with form of tender and condition of contract, &c., can be obtained from Kennedy & Jenkin, consulting engineers, 17, Victoria Street, Westminster, London, S.W., on payment of £3 3s., together with the specification, drawings, conditions of contract, &c. The specification and drawings can be seen at (but not obtained from) the offices of H. Ward, clerk, The Council House, Handsworth, near Birmingham. Tenders on the prescribed form, in sealed envelopes, and endorsed on the outside "Tramways Tender, Contract No. 14," must be delivered to him before noon on Dec. 12. Fair wages clause.

Jan. 3. York.—*Construction of the Selby and Goole Railway*, about 10 miles in length, for the North-Eastern Railway. The works comprise double-line railways chiefly on embankment (upwards of 1,000,000 cubic yards), with stations, station yards, warehouses, cottages, and other buildings, sidings, and bridges. The steelwork of the latter will amount to about 1,100 tons. Plans may be seen, and specification, detailed quantities, and form of tender obtained, on personal application at the office of W. J. Cudworth, Company's engineer, York. Sealed tenders, marked "Tender for Selby and Goole Railway," to be addressed to R. F. Dunnell, secretary, and delivered at his office at York not later than noon on Jan. 3.

IRON AND STEEL.

Nov. 23. Norway.—*Supply of* (1) 463,100 steel plates; (2) 115,100 spring rings for the Norwegian State Railways. Tenders (in sealed envelopes) for (1) should be marked "Anbud paa Underlagsplader"; for (2), "Anbud paa Fjaerringe." Specifications, working drawings, general and special conditions of tender relating to the above contracts may be seen at the Commercial Intelligence Branch of the Board of Trade, 73, Basinghall Street, London, E.C. Apart from the usual customs duties, a preference of from 10 to 15 per cent. is given to Norwegian manufacturers. In all cases of Norwegian Government contracts it is obligatory that a resident agent should act for tenderers not residing in Norway, and be responsible to the Government, but it is not necessary for the agent to be a Norwegian firm. Tenders will be received up to 3 p.m. on Nov. 23 at Jernbanestyrelsens, Expeditionskontor, Christiana.

Nov. 24. Durban, Natal.—*Supply and delivery* "free on board" of 4,800ft. of 24ft. diam. cast iron sewerage pipes, from British ironfounders only, for the Corporation. Specifications can be obtained from W. H. Radford, C.E. (consulting and representative engineer to the Corporation), Albion Chambers, Nottingham, on deposit of £2 2s. Sealed and endorsed tenders must be delivered to Webster, Steel & Co., agents to the Durban Corporation, 5, East India Avenue, Leadenhall Street London, E.C., on or before Nov. 24.

Nov. 27. London, S.W.—*Supply of 84ft. spans* for the Secretary of State for India in Council. The conditions of contract may be obtained on application to the Director-General of Stores, India Office, Whitehall, S.W., and tenders are to be delivered at that office by 2 p.m. on Nov. 27, after which time no tender will be received.

Nov. 27. Ilford.—*Supplying and fixing* about 700 lin. feet of wrought-iron ornamental fencing and gates and about 4,670 lin. feet of steel fencing, for the U.D.C. Plans and specification may be seen and form of tender obtained on payment of a deposit of £2 2s., on application to H. Shaw, A.M.I.C.E., engineer and surveyor to the Council, Town Hall, Ilford, during the usual office hours. Sealed tenders, endorsed "Tender for Fencing," must be sent to J. W. Benton, clerk to the Council, Town Hall, Ilford, Essex, on or before noon on Nov. 27.

Nov. 28. Durban, Natal.—*Supply and delivery* "free on board," of No. 30 5-in. by 4-in. galvanised iron pipes, together with bends, offsets, and heads, for the Corporation. Specifications can be obtained from W. H. Radford, C.E. (consulting and representative engineer to the Corporation), Albion Chambers, Nottingham. Sealed and endorsed tenders must be delivered to Webster, Steel & Co., agents to the Durban Corporation, 5, East India Avenue, Leadenhall Street, London, E.C., on or before Nov. 28.

Nov. 28. Dublin.—*Supply of* 800 *tons bullhead steel rails* (85 lbs. per lineal yard), with corresponding fishplates, half to be delivered in February, and half in July, 1907; also for the supply of 600 tons bullhead cast-iron chairs, 300 tons to be delivered in January, and 300 tons in June, 1907, for the Directors of the Dublin, Wicklow and Wexford Ry. Co. Specifications and forms of tender can be had on application to S. J. Shannon, C.E., 1, Westland Row, Dublin. Tenders, marked "Tender for Rails and Chairs," and addressed to M. F. Keogh, secretary, Westland Row Station, Dublin, to be forwarded so as to be received not later than 10 a.m. Nov. 28.

Nov. 29. The Hague.—*Supply of the following railway material:*—Contract No. 434.— Supporting springs. Contract Lit. Z 12.—Mild steed. Contract Lit. A 13.—Corrugated and flat galvanised mild steel, bolts, nails, and hooks. Contract Lit. B 13.—40 uprights for fountains. Contract Lit. C 13.—Zinced wire. Particulars can be obtained from Mr. M. Nijhoff, The Hague, at a cost of 3s. 4d. for Contract No. 434; 1s. 8d. for Contracts Lit. Z 12 and A 13; and 10d. for Contracts Lit. B 13 and C 13. Tenders will be received by Nov. 29 at the Colonial Office at the Hague.

Nov. 30. Malta.—*Supply of a hopper barge.* Tenders are to be accompanied by a deposit of 30s., to be made in the office of the Crown Agents, Whitehall Gardens, London, S.W., by tenderers residing in Great Britain, not having a representative in Malta. Particulars, specifications, &c., may be obtained on application to the Crown Agents for the Colonies, Whitehall Gardens, London, S.W. Tenders will be received at the office of the Receiver-General and Director of Contracts, Valletta, up to 11 a.m. Nov. 30.

PAINTING AND PLUMBING.

Dec. 1. Anerley.—*Redecoration, &c.*, of the school chapel for the Board of Management of the North Surrey District School. The drawings and specification may be seen, and form of tender obtained, at the offices of Hennell & Son, architects, 8 & 9, Essex Street, Strand, W.C. Tenders, sealed and endorsed "Chapel," must be addressed to the Managers, North Surrey District School, Anerley, S.E., and sent in not later than Dec. 1.

ROADS AND CARTAGE.

Nov. 22. London, N.E.—*Kerbing, channelling, paving, making-up, &c.*, of Cotesbach Road (Clapton), for the Hackney B.C. The general conditions of contract and the specification and plan and sections may be inspected, and copies of the bill of quantities and form of tender obtained, on application to N. S. Moonst, C.E., borough engineer and surveyor, and on payment of the sum of £1 1s. Fair wages clause. Tenders, sealed and endorsed "New Street Works," must be delivered at the Town Hall, Hackney, N.E., not later than 5 p.m. on Nov. 22.

Nov. 23. Brighton.—*Supply of 1,000 tons of granite spalls* for the Brighton C.C. The specification and form of tender may be obtained on application at the office of the Borough Surveyor, at the Town Hall, Brighton. Sealed tenders, addressed to H. Talbot, town clerk, Town Hall, Brighton, and endorsed "Tender for Granite Spalls," must be left before 10 a.m. Nov. 23.

Nov. 24. Newhaven —*Supply of 150 cubic yards of granite,* broken to pass through a 1½-in. ring, and to be delivered free either into the Council's carts on the west side of the Harbour, or in trucks at Newhaven Town Station, for the U.D.C. Forms of tender (which alone will be considered) can be obtained from E. Knightley, clerk to the Council. Tenders and samples to be sent to him, under cover, and marked "Granite," not later than Nov. 24, at noon.

Nov. 26. Hemsworth.—*Making of Victoria Street,* Hemsworth, according to plan, section, and specification, which may be seen at the office of T. H. Richardson, in Hemsworth, between 9 a.m. and 5 p.m. Tenders to be sent in to J. Scholefield, clerk, Hemsworth, near Wakefield, on or before Nov. 26.

Nov. 26. Birmingham.—*Supply of road material* (broken or unbroken), delivered at the various railway stations and wharves in the county, for the Warwickshire C.C. Sealed tenders (on forms to be obtained from the County Surveyor), addressed "Tenders for Road Material," must be delivered or sent to J. Wilmot, county surveyor, Birmingham, on or before Nov. 26.

Nov. 27. Bootle.—*Supply of granite paving materials* for the Corporation. Forms of tender may be obtained at the office of B. J. Wolfenden, A.M.I.C.E., Borough engineer, Town Hall. Tenders to be sent to the Town Clerk on or before 10 a.m. on Nov. 27, endorsed "Tender for Granite Paving Materials."

Nov. 27. Batley.—*Levelling, paving, flagging, channelling*, and completing of each of the following streets:—Heaton Road; Yard No. 4, Bradford Road, and Yard No. 7, Bradford Road, in the Borough of Batley, for the Town Council. Plans, sections, and specifications of the said works respectively may be seen on application to O. J. Kirby, borough engineer and surveyor. Sealed tenders, on forms which may be obtained from the Borough Surveyor, properly endorsed, to be delivered to J. H. Craik, town clerk, Town Clerk's office, not later than Nov. 27.

Nov. 27. Woodbridge.—*Road material* for the year ending March 31, 1908, to be delivered as follows for the R.D.C.:—Granite or basalt, broken to 2-in. and 1½-in. gauge, at Council's wharf at Wilford Bridge or Melton G.E.R. Station, 1,600 tons; at Levington Creek and Nacton Hard, or at Orwell and Trimley G.E.R. Stations, 400 tons. Whole chalk flints: at Council's wharf at Wilford's Bridge, 1,600 tons; at Boyton Dock, 200 tons; at Levington Creek and Nacton Hard, 600 tons; at Westerfield G.E.R. Station, 100 tons. All materials to be delivered between April 1 and Sept. 1, 1907, at such times and in such quantities as the Surveyor may direct, and will be subject to his approval. All material rejected by him will remain at the contractor's risk and expense. Tenders, accompanied by samples, must be delivered (carriage paid) to H. E. Kell, New Street, Woodbridge, endorsed "Tender for Road Material," on or before Nov. 27. Any further information may be obtained of George Cook, district surveyor, Grundisburgh, near Woodbridge, by enclosed stamped directed envelope.

Nov. 30. London, N.E.—*Supplying and laying wood paving* in front of the Town Hall and the Hospital, Orford Road, Walthamstow, for the U.D.C. Form of tender may be obtained and plan and specification inspected on application to G. W. Holmes, A.M.I.C.E., Council's engineer, Town Hall Annexe, Walthamstow. Sealed tenders, endorsed "Tender for Wood Paving," to be delivered to C. S. Watson, clerk to the Council, Town Hall, Walthamstow, not later than Nov. 30, at 5 p.m.

Dec. 1. London, W.—*Paving with granite setts* the passageway at the rear of Beethoven Street, and the execution of contingent works, all the granite setts, and certain other materials being supplied from the Council's stock, for the B.C. of Paddington. General conditions, specifications, schedule of quantities, and forms of tender will be furnished upon application to the Borough Surveyor, Town Hall, Paddington, W., upon payment of £1 for a set containing one copy of each document. Tenders, endorsed "Passageway," to be addressed to the Town Clerk and delivered at the Town Hall not later than Dec. 1.

SANITARY.

Nov. 22. London, S.E.—*Reconstructing drains*, providing and erecting new w.c.'s, &c., at the Workhouse, Tanner Street, Bermondsey, S.E. Persons desirous of tendering may obtain specification and printed forms of tender (which can only be received), containing full particulars and conditions, from the Clerk's office, between 10 a.m. and 12 noon daily, until Nov. 16, on depositing a £5 Bank of England note. Sealed tenders, endorsed "Tender for Drains," must be delivered to E. P. Fenton, clerk, 283, Tooley Street, S.E., personally, not later than 6.30 p.m. on Nov. 22, and the tender will be opened and considered at 7 p.m., at the meeting of the Guardians to be held the same day, at which date, time, and place a responsible member of the firm tendering must be in attendance.

Nov. 26. Mears Ashby.—*Constructing sewers* and sewage disposal works in the parish of Mears Ashby for the Wellingborough R.D.C. Plans and specifications may be seen and quantities obtained at the Engineer's office on payment of £2. Tenders, sealed and endorsed "Mears Ashby Sewerage," to be delivered to J. B. Williams, engineer, Moot Hall, Daventry, on or before Nov. 26.

Nov. 28. Enniskerry, Co. Wicklow.—*Construction of sewerage works* at Enniskerry, Co. Wicklow, and other works connected therewith, for the Rathdown (No. 2) R.D.C., in accordance with the plans, specifications, &c., prepared by J. H. Ryan, M.Inst.C.E., and R. M. Butler, A.M.Inst.C.E.I., engineers. Conditions, specification, and quantities can be inspected and forms of tender obtained at the engineer's office, 22, Nassau Street, or at the Clerk's Office, Loughlinstown, on all week-days between 11 a.m. and 3 p.m. Sealed tenders upon the form supplied (and none other will be entertained) to be sent in, and addressed to the Chairman of the Council, not later than 10 a.m. on Nov. 28, and endorsed "Tender for Enniskerry Main Drainage."

Dec. 3. London, S.W.—*Collection and removal of house refuse* in the Eastern District (comprising the Clapham North, Clapham South, Balham, Streatham, and Tooting Wards), for the Wandsworth Borough Council, for the period of one, two, or three years, at the option of the Council from Dec. 31. Forms of tender and specification may be obtained and form of contract seen, of H. G. Hills, town clerk, Council House, Wandsworth, S.W., between the hours of 10 a.m. and 4 p.m. (Saturdays 10 till 1). Fair wages clause. Tenders, sealed and endorsed "House Refuse," must be delivered not later than Dec. 3. No tender will be received unless it is made upon one of the printed forms issued from these offices.

Dec. 5. Watford.—*Supply of about* 1,750 lin. yds. of earthenware or stoneware sewer pipes, 15ins. in diam,, and 1,100 lin. yds. of earthenware or stoneware sewer pipes, 9ins. in diam. Specification and form of tender may be obtained at the Engineer's office, 14, High Street, Watford. Sealed tenders, on the form supplied, addressed to H. M. Turner, clerk, Council offices, 14, High Street, Watford, and endorsed "Tender for Sewer Pipes," are to be delivered, with samples of the pipes, not later than Dec. 5.

Dec. 5. Watford.—*Laying about* 1,750 yards 15ins. diam. earthenware sewer and storm-water drain (mostly in headings), and 960 yards 9ins. diam. earthenware sewer and storm-water drain, together with the necessary manholes, iron pipes, &c., for the U.D.C. Persons desirous of contracting for the work may see the drawings, form of contract, specifications, &c., at the offices of the Council, 14, High Street, Watford, between the hours of 9.30 a.m. and 1 p.m. A copy of the schedule of works and a form of tender can be obtained at the offices of the Council upon the payment of £3 3s. Sealed tenders, addressed to H. M. Turner, clerk to the Council, Council offices, Watford, and endorsed "Tender for Sewerage," must be delivered under cover to him at Watford not later than Dec. 5.

Jan. 7. Stourport.—*Provision, laying and jointing* of cast-iron and stoneware pipe sewers, together with manholes, lampholes and flushing chambers, the construction of task sewer, engine-house, liquefying tanks, distributing carriers, effluent drains, and other incidental works, in accordance with the drawings and specification prepared by the engineers. Drawings and specification may be seen and bills of quantities obtained at the offices of Wilcox & Raikes, engineers, 63, Temple Row, Birmingham, on payment of a deposit of £5 5s. Sealed tenders, in the envelopes supplied, endorsed "Stourport Sewerage—Contract No. 1," to be delivered to C. H. Watson, clerk to the Council, Stourport, not later than 12 o'clock noon on Jan. 7.

MISCELLANEOUS.

Nov. 22. West Hartlepool.—*Supply of the following goods and materials* (a) during the year ending December 31, 1907:—Form No. 1, Kerbstone, flags, paving setts, roadstone, pitch and tar, lime; 2, sewer pipes; 3, metal castings; 3A, ventilating pipes; 4, cement; 8, cartage, West Hartlepool; 9, cartage, Seaton Carew; 10, general and hardware, picks, shovels, scythes, oil, firewood. Specifications and forms of tender can be obtained upon application to N. F. Dennis, borough engineer, Municipal Buildings, West Hartlepool, and samples of castings and general stores seen upon application to the Storekeeper at the Corporation Depôt, Stranton, West Hartlepool. Samples of flags, kerbstones, and provender, labelled with name and address of sender, to be delivered to the Borough Engineer, carriage paid. Tenders for all goods to be addressed to the Chairman of the Works Committee, endorsed with the description of goods and materials tendered for, to be delivered at the Office of the Town Clerk, 78, Church Street, West Hartlepool, not later than 4 p.m. on Nov. 22.

Nov. 24. Felling, Co. Durham.—*Supply of the following goods* for twelve months ending Dec. 31, 1907:—Kerb, flags, setts, &c., whinstone, kerb, setts, Portland cement. Tenders must be on the printed form, which may be obtained from the Surveyor any morning between 9 and 10, or will be sent on receipt of stamped addressed envelope. Tenders must reach G. Bolam, clerk to the Council, Council Buildings, Felling, R.S.O., Co. Durham, not later than Nov. 24, endorsed with the nature of the quotation.

Nov. 24. Bradford.—*Supply of the following stores* required by the tramways department during the year ending December 31, 1907:—Schedule No. 1.—Bolts, nuts, screws, washers, cotter pins, rivets, hand tools, &c. No. 9.—Galvanised steel strand wire. No. 10.—Iron brake shoes, iron, malleable steel and brass castings. No. 13.—Bar iron, &c. No. 16.—Paints. No. 17.—Dry colours. No

18.—Genuine white lead. No. 20.—Glue, Paris white, pumice stone, alum, common soda. No. 21. —Varnishes. No. 26.—Timber. Forms of tender and conditions may be had on application at the tramway's offices, 15, Bridge Street, Bradford, on payment of the sum of £1 1s. The contract will be let subject to the fair contract clauses of the Corporation, which may be seen at the Town Clerk's office, and which the accepted contractors will be required to sign. Samples can be inspected at the Thornbury Car Depot. Tenders, endorsed "Tender for Stores," to be sent to F. Stevens, town clerk, Town Hall Bradford, not later than Nov. 24.

Nov. 27. Vejer de la Frontera, Spain.—*Public lighting* of the town by means of electricity during the years 1907-16 inclusive, in accordance with conditions set forth in the "Gaceta de Madrid" of Oct. 28. 104 lamps of 10-candle power and 80 lamps of 5-candle power will be required. The annual rental payable by the Municipality is 7,420 pesetas (about £269), or such lower figure as the competition may elicit. The "Gaceta" may be seen at the Commercial Intelligence Branch of the Board of Trade, 73, Basinghall Street, London, E.C. Tenders will be opened at the "Casa Consistorial," Vejer de la Frontera, on Nov. 27.

Nov. 28. Chatham.—*Supply of the following goods* and materials during the year ending December 31, 1907:—Schedule No. 1, Aylesford gravel, Aylesford sand, crushed Kentish ragstone; 2, Portland cement; 4, stoneware drain-pipes, street gullies, &c.; 5, timber; 6, sewer ironwork; 9, paints and oils, for the Town Council. Specifications, stipulations, schedules, and forms of tender can be obtained, and samples seen, on application at the Borough Surveyor's Office, Town Hall, Chatham. Sealed tenders, on the forms supplied, endorsed with the name of the goods tendered for, to be addressed and delivered to C. Day, borough surveyor, Town Hall, Chatham, before 10.30 a.m. on Nov. 28.

Dec. 1. York.—*Supply of following articles* during the six or twelve months from Jan. 1:—(1) Bar iron; (2) iron plates; (3) steel plates; (4) iron sheets and hoop iron; (5) steel sheets; (5A) corrugated iron sheets; (6) steel angles; (7) mild-steel bars; (8) ironwork for wagons; (9) wheels for carts and road vehicles; (10) metal castings for engines, carriages, and wagons; (11) metal castings (permanent way); (12) malleable castings (permanent way); (13) steel castings (permanent way); (14) steel fishplates; (15) cast-iron chairs; (16) cast-iron point and crossing chairs; (17) cast-iron socket pipes; (18) rain-water goods; (19) steel and files; (20) buffer and bearing springs; (21) steel tubes for locomotives; (22) brass and copper tubes for locomotives; (23) copper pipes; (24) copper (bolt); (27) electric wires and cables; (28) lead (pipe and sheet); (29) white and red lead; (30) linseed oils (boiled and raw); (31) oils (paraffin and for gasmaking); (41) nails; (42) screws (brass and iron); (45) hinges (brass and iron); (46) steel and iron wire ropes and cords; (47) steel and iron signal wire and signal cord; (48) iron bolts and nuts and twisted spikes; (49) bolts, nuts, and rivets; (50) cement (best Portland); (51) concrete and artificial stone flags; (52) flags; (53) stone; (55) limestone; (57) lime; (58) sanitary drain pipes; (59) comon drain pipes. Forms of tender, specifications, and conditions may be obtained on application to E. H. Clark, Stores, Gateshead; and tenders must be sent in to R. F. Dunnell, secretary, York, sealed and marked "Tender for Stores," not later than 9 a.m. on Dec. 1.

Dec. 3. Norwich.—*Supply of the following materials and work* during 1907.—Gravel, flints, &c., paving setts, materials for macadam roads, cement, ironware drainage pipes and fittings, stoneware ditto, British wood, foreign wood, iron, cast-iron manhole covers, gullies, &c., bricks, tar shingle for bottoms, footpath tar-paving and tar-macadam materials, engine fitter, boiler maker, and founder. The necessary specifications, forms of tender, &c., may be obtained of E. Collins, M.Inst.C.E., city engineer, &c., Guildhall, Norwich. Tenders, on the forms supplied, enclosed in envelopes sealed with sealing wax, endorsed "Tender for ——," and addressed to the Chairman of the General Purposes Committee, must be delivered at the City Engineer's office not later than 10 a.m. on Dec. 3.

TOO LATE FOR CLASSIFICATION.

Nov. 23. Tavistock.—*Erection of new offices, &c.*, at the Council School. The plan and specification can be seen, and forms of tender obtained, at the school between 9.30 a.m. and 5 p.m. till Nov. 22. Tenders, written on the above-mentioned form, must reach the architect, 1, Richmond Road, Exeter, not later than the first post on Nov. 23.

Nov. 23. Manchester.—*Sewering, draining, paving, &c.*, numerous streets, for the Paving, Sewering and Highways Committee. Forms of tender may be obtained on application to the Paving, &c., Department (Surveyor's Office), and must be returned to the chief clerk, Paving, &c., Department, Town Hall, Manchester, before 10 a.m. on Nov. 23.

Nov. 24. Kildorrery.—*Erection of a suitable hall*, which will be considered and decided upon at a meeting to be held on Nov. 25. The structure is to be in accordance with plans and specification, which can be seen at the Kildorrery Post Office. Sealed tenders will be received by the Rev. J. Nagle, C.C., up to and including Nov. 24.

Nov. 26. Harrogate.—*Private street works* required in Back Road at the side of No. 4, Springfield Avenue, for the Corporation. The specification may be seen, and quantities obtained, of F. Bagshaw, borough engineer and surveyor. Tenders must be submitted not later than 9 a.m. on Nov. 26.

Nov. 27. Waterloo-with-Seaforth.—*Sewering, paving, flagging*, kerbing, channelling, &c., in various streets and passages, for the U.D.C. Plans and specifications may be seen, and bills of quantities and form of tender obtained, on application to F. Spencer Yates, A.M.Inst.C.E., the surveyor to the council, at the Town Hall, Waterloo. The sum of 10s. 6d. must be deposited for quantities. Sealed tenders on the forms supplied, addressed to the Chairman of the General Purposes Committee, and endorsed "Tender for Private Street Works," are to be delivered at the Town Hall, Waterloo, not later than 12 noon on Nov. 27.

Nov. 27. Hitchin.—*Erection of a new boiler shaft* at the Union Workhouse, Hitchin. A plan and specification can be seen of A. E. Passingham, clerk, Union Offices, Old Town Hall, Hitchin. Sealed tenders, endorsed "Boiler Shaft," to be received by him not later than 10 a.m. on Nov. 27, and such tenders will be opened at a meeting of the Guardians on the same day.

Nov. 28. Edinburgh.—*Alterations to* 65-73, *Henderson Row*. Plans, specifications, and schedules of measurement prepared by the Burgh Engineer, from whom schedules of quantities and all particulars may be obtained. Sealed offers, endorsed "Tender for Alterations, Henderson Row," must be lodged with T. Hunter, W.S., town clerk, City Chambers, Edinburgh, not later than Nov. 28, at 10 a.m.

Nov. 30. Slough.—*Supply of materials* and labour required in making up, &c., Gray's Road, Slough, for the U.D.C. Plans and specifications may be seen and schedules of quantities obtained from W. W. Cooper, town surveyor, Slough, on payment of a deposit of £1 1s. Sealed tenders, endorsed "Private Street Works," addressed Chairman of Highways Committee, 1, Mackenzie Street, Slough, to be sent in on or before Nov. 30.

Nov. 30. Pontypridd.—Contract No. 1.—376yds. of stoneware pipe sewers and contingent works. Contract No. 2.—Private street works in Graig Terrace. Contract No. 3.—Private street works in Madoc Street. Contract No. 4.—Private street works in Factory Lane. Contract No. 5.—Private street works in Wood Street, Cilfynydd, for the U.D.C. Plans may be seen and specifications and bills of quantities obtained at the office of the engineer and surveyor, P. R. A. Willoughby, A.M.Inst.C.E. Tenders on the prescribed form, sealed and endorsed "Contract No. —" (as the case may be), must be received by J. C. Jones, clerk to the council, Municipal Buildings, Pontypridd, on or before Nov. 30.

Dec. 3. Woodbury.—*Alterations and additions* to The Lodge, near Woodbury, Devon, for Mr. W. Arnold, of Woodbury. Builders willing to tender may see the plans and specifications of E. H. Harbottle & Son, architects, County Chambers, Exeter. Tenders to be delivered to them on or before Dec. 3.

Dec. 5. Leicester.—*Supply of the following materials*, as may be ordered during the year 1907:—(1a) Iron and steel. (1b) Ironmongery, &c. (2) Oils, paints, and sundries. (3) Timber—English. (4) Timber—foreign. (6) Sewerage and other ironwork, &c. (7) Bricks. Form of tender, &c., may be obtained on deposit of 10s. Cheques, &c., should be made payable to the Borough Treasurer. Sealed tenders for each contract, in separate envelopes, addressed to the "Chairman of the Highway and Sewerage Committee," and endorsed "Tender for Stores," are to be delivered to E. G. Mawbey, M.Inst.C.E., borough engineer and surveyor, Borough Surveyor's Office, Town Hall, Leicester, not later than Dec. 5.

Dec. 5. Leicester.—*Supply of granite kerb*, setts, randoms, ringsmall, rammel, spallings, chippings, gravel, &c.; also for Breedon gravel, &c., as may be ordered during the year 1907. Forms of tender, &c., may be obtained on deposit of 10s. Cheques, &c., should be made payable to the borough treasurer. Tenders and samples are to be delivered to E. G. Mawbey, M.Inst.C.E., borough engineer and surveyor, Borough Surveyor's Office, Town Hall, Leicester, not later than Dec. 5, addressed to the "Chairman of the Highway and Sewerage Committee," and endorsed "Tender for Granite."

Dec. 5. Twickenham.—*Erection of new Post Office* at Twickenham. Drawings, specification, and a copy of the conditions and form of contract may be seen on application to J. Rutherford, H.M. Office of Works, &c., Storey's Gate, S.W., where bills of quantities and forms of tender may be obtained on payment of £1 1s. Tenders must be delivered before 12 noon on Dec. 5, addressed to the Secretary, H.M. Office of Works, &c., Storey's Gate, London, S.W., and endorsed "Tender for Twickenham New Post Office."

Dec. 11. Cardiff.—*Construction of a bridge* over the railway at Beresford Road level crossing, Cardiff, for the Directors of the Gt. Western Ry. Plans and specification may be seen and forms of tender and bills of quantities obtained at the office of the engineer at Newport Station, between 10 a.m. and 4 p.m. Tenders addressed to G. K. Mills, secretary, Paddington Station, London, and marked outside "Tender for Beresford Road Bridge, Cardiff," will be received on or before Dec. 11.

No date. Wemmergill.—*Additions to and strengthening of* Wemmergill Bridge (stone) at Wemmergill, on the Middleton-in-Teesdale and Brough main road. Contractors desirous of tendering may see the plans and specification and obtain bills of quantities at the County Surveyor's office, County Hall, Northallerton, from Dec. 3—15, inclusive, between 9.30 a.m. and 4 p.m.; Saturdays until 12 noon.

No date. Strensall.—*Laying of about* 370 *lineal yards* of 9in. sanitary pipe, together with the construction of the various manholes, &c., that may be required for the Flaxton R.D.C. Persons willing to tender are requested to forward their names and addresses to E. T. Felgate, Council's surveyor, 3, Stonegate, York. Bills of quantities will be supplied.

New London Buildings

At yesterday's meeting of the London County Council the Building Act Committee reported the following applications under the London Building Act, 1894, their recommendations as to consent or refusal being appended in *italics*:

Waiting-room at No. 69, Brook Green, Hammersmith, to abut upon Caithness Road, on the application of J. McManus, on behalf of Dr. Denne. (*Consent.*)

Addition in front of the Convent school of Notre-Dame, No. 55, Tollington Park, Islington, on the application of J. H. Goodchild, on behalf of the trustees of the school. (*Consent.*)

Houses with bay-windows and pent roofs on the southern side of Woolstone Road, Lewisham, to abut also upon the eastern side of Broxted Road, on the application of Norfolk & Prior, on behalf of G. H. Walker. (*Consent.*)

Projecting iron and glass skylight over a portion of the area of No. 28, Grosvenor Street, St. George, Hanover Square, abutting upon Davies Street, on the application of C. W. Stephens, on behalf of Lord Edward Churchill. (*Consent.*)

Additional storey to a bay-window in front of No. 39, Berkeley Square, St. George, Hanover Square, on the application of Bertram & Son, on behalf of A. Paget. (*Consent.*)

Two iron and glass shelters in front of the Waldorf Theatre, Aldwych and Catherine Street, so far as relates to an alteration in the method of fixing the two central cantilevers of the shelter at the main entrance to the theatre, on the application of Waring & Gillow, Limited. (*Consent.*)

One-storey shops in front of Nos. 289 to 303 (odd numbers only) inclusive, Streatham High Road, Streatham, on the further application of A. E. Chasemore, on behalf of G. W. Elvin. (*Consent.*)

Six houses on the northern side of Church Lane, Tooting, between Moring Road and Lucien Road, on the application of Nash & Lillywhite. (*Consent.*)

Retention of bay-windows and porches to six houses on the northern side of Streatham Common North, Wandsworth, between Valley Road and Deerhurst Road, on the application of W. Newton Dunn. (*Consent.*)

Porches to ten houses on the southern side of Hazlewell Road, Putney, between Larpent Avenue and Luttrell Avenue, on the application of J. C. Radford, on behalf of E. R. Parry. (*Consent.*)

Building at St. Anne's Home, Streatham Hill, Wandsworth, on the application of W. Begley, on behalf of the Guardians of St. Pancras. (*Consent.*)

Motor house at the rear of No. 240, Burrage Road, Plumstead, to abut upon Cambridge Place, on the application of J. O. Cook, on behalf of Dr. F. H. Preston. (*Consent.*)

Bringing forward of a one-storey addition in front of No. 422, Mare Street, Hackney, on the application of Davis & Emanuel, on behalf of H. W. Hickman. (*Refusal.*)

Iron and glass covered way in front of No. 20, Lansdowne Road, Holland Park, Kensington, on the application of G. H. Fox, on behalf of T. Pocklington. (*Refusal.*)

Additions and raised basements at Nos. 1 & 2, Albert Villas, Station Approach, Catford Bridge, on the application of A. W. Osborn, on behalf of D. Murray. (*Refusal.*)

Iron and glass shelter in front of a building on the northern side of Wigmore Street, St. Marylebone, abutting also upon Welbeck Street, on the application of Wallace & Gibson, on behalf of Debenhams, Limited. (*Refusal.*)

Projecting porch in front of No. 23, Upper Wimpole Street, St. Marylebone, on the application of S. W. Neighbour, on behalf of C. Gibbs. (*Refusal.*)

Two houses on the north-western side of Herne Hill, Norwood, to abut also upon Poplar Walk, on the application of F. J. Handforth. (*Refusal.*)

Retention of a boundary fence wall in connection with building at the rear of No. 111, Camberwell Road, Camberwell, at less than the prescribed distance from the centre of the roadway of Goodye Place, on the application of A. E. Symes, on behalf of the Addington Timber, Slate and Cement Company, Limited. (*Consent.*)

Additions at St. John's School, Heathfield Street, Notting Hill, at less than the prescribed distance from the centre of the roadway of Heathfield Street, on the application of Beazley & Burrows, on behalf of the managers of the school. (*Consent.*)

Retention of a one-storey building on the southern side of Seymour Place, Fulham Road, Kensington, between Nos. 9 and 11, and at less than the prescribed distance from the centre of the roadway of the street, on the application of M. King. (*Consent.*)

Retention of manure pits on the eastern side of Logan Mews, Logan Place, Kensington, at less than the prescribed distance from the centre of the roadway of Logan Mews, on the application of Chesterton & Sons, on behalf of A. H. Farrow. (*Consent.*)

Buildings on the northern side of Webber Street, Southwark, to abut also upon the eastern side of Valentine Place, on the application of W. Egerton, on behalf of the Maltina Company. (*Consent.*)

One-storey addition at the rear of "The Windsor" public-house, No. 427, Strand, at less than the prescribed distance from the centre of Harvey's Buildings, on the further application of H. G. Leslie. (*Consent.*)

Workshop building at the rear of No. 69, Pattison Road, Woolwich, at less than the prescribed distance from the centre of a passageway leading from Pattison Road to Hudson Road, on the application of H. Greenberg. (*Refusal.*)

Formation or laying out of a new street for carriage traffic on a site on the eastern side of Temple Mills Road, Hackney Wick, on the application of Reynolds & Eason, on behalf of A. E. and O. Bradshaw. (*Refusal.*)

Buildings upon the site of No. 112, Westbourne Grove, Paddington, with an irregular open space at the rear, on the application of G. A. Sexton, on behalf of T. Elliott & Sons. (*Consent.*)

Buildings upon a site on the eastern side of Lolesworth Street, Whitechapel, to abut also upon Wentworth Street and Thrawl Street, with an irregular open space at the rear, on the application of Dolley & Altman. (*Consent.*)

Addition over a portion of the space at the rear of No. 39, Curzon Street, Mayfair, on the application of Mrs. B. Skeffington-Smyth. (*Consent.*)

Addition to "Berkeley House," on the southern side of Hay Hill, St. George, Hanover Square, to abut also upon Berkeley Street, on the application of W. Wonnacott, on behalf of A. H. Young. (*Consent.*)

Separation with glazed wooden screens of a proposed lock-up shop to be erected in the booking hall of the Finchley Road Station (Metropolitan Railway), on the application of E. Owers. (*Refusal.*)

Applications before last week's meeting—

Station buildings on the northern side of St. John's Hill, Battersea. (*Rescission of resolution.*)

Station buildings on the northern side of St. John's Hill, Battersea, on the application of C. L. Morgan, on behalf of the London, Brighton & South Coast Railway Co. (*Consent.*)

Billiard room and lavatory addition at the rear of No. 32, Brompton Square, Kensington, at less than the prescribed distance from the centre of the roadway of Ennismore Gardens Mews, on the application of Hubbard & Moore, on behalf of A. Simson. (*Consent.*)

Formation of a new street to lead from Richmond Road to Cloudesley Square, Islington. (*Modification of resolution.*)

Building on the southern side of Loampit Vale, Lewisham, at less than the prescribed distance from the centre of the roadway of Shrubbery Road, on the application of A. W. Osborn, on behalf of G. A. Harvey & Co. (*Consent.*)

Building on the western side of Chatsworth Road, Hackney, to abut upon the southern side of Elderfield Road, on the application of H. Dearsly & Son. (*Consent.*)

Retention of a wooden summer-house in front of No. 2, Moreton Gardens, Gilston Road, Kensington, on the application of C. G. F. Rees, on behalf of C. E. Melchers. (*Consent.*)

Houses with bay windows upon the site of Nos. 81 to 87 (odd numbers only) inclusive, Dulwich Road, Herne Hill, to abut also upon Herne Place, in connection with the application of H. Wakeford & Sons, on behalf of E. Lyne. (*Consent.*)

Four projecting balconies at the Holborn station of the Great Northern, Piccadilly and Brompton Railway, two of such balconies to abut upon Kingsway, and two upon Gate Street, on the application of L. W. Green, on behalf of the Underground Electric Railways Co., of London, Ltd. (*Consent.*)

Water closet and lavatory addition at No. 6, Carlton Gardens, Waterloo Place, in connection with the application of Bywaters & Sons, Ltd., on behalf of the Rt. Hon. Viscount Llandaff. (*Consent.*)

Retention of three projecting signs at Nos. 22 and 23, Long Acre. (*Consent.*)

Building on the eastern side of Gwendolen Avenue, Putney, adjoining the Putney Wesleyan Church, on the application of A. Dawkins, on behalf of the trustees of the Putney Wesleyan Church. (*Consent.*)

Retention of an addition at No. 47, Great Guildford Street, at less than the prescribed distance from the centre of the roadway of the street, on the application of G. Newton. (*Consent.*)

Formation of new streets for carriage traffic to lead out of Wavertree Road and Nuthurst Avenue, Brixton, so far as relates to an alteration in the cross section of the streets, on the application of Briant & Son. (*Consent.*)

Wood and iron building of a temporary character, at the side of No. 39, Munster Road, Fulham, on the application of J. Cable, on behalf of J. H. Neave. (*Refusal.*)

Retention of barriers across the entrances to a new street leading out of the eastern side of Merton Road, Wandsworth, on the application of H. O. Carr, on behalf of the Wandsworth & Putney Gas Light & Coke Co. (*Consent.*)

Formation or laying out of two new streets on a site abutting upon the south-western side of Rosendale Road, Herne Hill, southward of Norwood Road, in connection with a scheme for the erection of working-class dwellings upon such site, on the application of W. E. Wallis, on behalf of the governors of the Peabody Donation Fund. (*Consent.*)

Construction of an elevator, a conveyor and a weigh-house at the generating station, Townmead Road, Fulham, on the application of A. J. Fuller on behalf of the Fulham Metropolitan Borough Council. (*Consent.*)

Formation of openings at the ground floor level between No. 5, Threadneedle Street, and No. 8, Finch Lane, City, on the application of T. B Whinney, on behalf of the London, City & Midland Bank. (*Refusal.*)

Current Market Prices.

METALS.

		£	s.	d.	£	s.	d.
Standard Copper	per ton	100	0	0	101	0	0
Do. Strong sheets ...	do.	114	0	0	114	10	0
Lead, soft foreign	do.	19	7	6	19	10	0
Do. English	do.	19	10	0	19	15	0
Do. pipes...	do.	21	12	6	21	15	0
Do. sheets	do.	21	2	6	21	5	0
Galvanised Corrugated sheets	do.	13	7	6	13	10	0
Spelter G.M.	do.	27	10	0	28	0	0
Angles, Scotland	do.	6	12	6	6	15	0
Bars, do.	do.	7	15	0	7	17	6
Marked bars, Staffs. ...	do.	8	7	6	8	10	0
Common bars, do. ...	do.	6	17	6	7	0	0
Angles, M'boro.	do.	6	10	0	6	12	6
Joists. M'boro	do.	6	7	6	6	10	0
Angles, Midlands	do.	6	12	6	6	15	0
Joists do.	do.	6	17	6	7	0	0

TIMBER.

		£	s.	d.	£	s.	d.
Deals, Archangel, White, 2nd, 3×11	per std.	11	0	0	—		
Do. do. do. do. 3×9	do.	10	0	0	—		
Do. do. do. unsorted, 3×8	do.	8	15	0	—		
Do. do. Yellow, 3rd 3×9	do.	10	15	0	—		
Do. do. do. 4th 3×9	do.	8	10	0	—		
Do. Gefle, Yellow, 3rd 3×9	do.	11	10	0	—		
Do. Kallskav (Söderhanm) Yellow, 4th, 3×9	do.	10	0	0	—		
Do. do. do. 5th, 2½×7	do.	9	10	0	—		
Do. Kovda, Yellow, (Russanoff's) 4th 3×9	do.	8	15	0	—		
Do. Mo, Ye low, 5th 3×7	do.	8	10	0	—		
Do. Petschora, Yellow, 2nd, 3×11	do.	16	0	0	—		
Do. do. do. 3rd, 3×11	do.	10	0	0	—		
Do. do. do. do 3×9	do.	10	10	0	—		
Do. Quebec, Spruce, 2nd, 3×9	do.	9	15	0	10	0	0
Deals, St. Petersburg, White, 3rd, 3×11	per std.	8	5	0	—		
Do. do. do. do. 2½×7	do.	8	0	0	—		
Do. do. Yellow do. 3×11	do.	7	15	0	—		
Do. Soroka, Yellow, 2nd, 3×11	do.	16	0	0	—		
Do. do. do. do. 3×9	do.	14	10	0	—		
Battens, Christinestad, White, unsorted, 2×4	do.	8	10	0	—		
Do. Fredrikshamn, Yellow, 1st and 2nd, 2×4½	do.	8	0	0	—		
Do. do. do. do. 2×4	do.	9	5	0	—		
Do. do. White, do. 2×4	do.	8	5	0	—		
Do. Ingramport, White, unsorted, 2×5	do.	7	5	0	—		
Do. do. do. do. 2×4	do.	7	15	0	—		
Do. Kallskav, Yellow, 4th, 2×7	do.	9	10	0	9	15	0
Do. Kotka, Yellow, unsorted, 2×4½	do.	8	10	0	—		
Do. Mesane, Yellow, 3rd, 2×11	do.	10	15	0	—		
Do. Mo, Yellow, 2nd, 2×7	do.	9	0	0	—		
Do. Räfsö, Yellow, 2×4	do.	7	15	0	—		
Do. do. White, 4th, 2×4	do.	8	0	0	—		
Do. St. Petersburg, White, 3rd, 2×6	do.	7	15	0	7	5	0

Coming Events.

Wednesday, November 21.

NORTHERN ARCHITECTURAL ASSOCIATION.—Presidential address by Mr. J. T. Cackett, F.R.I.B.A., at 7.30 p.m.

Thursday, November 22.

INSTITUTION OF ELECTRICAL ENGINEERS.—Prof. Epstein on "The Selection and Testing of Materials for the Construction of Electric Machinery," at 8 p.m.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—Opening Meeting. Presidential address by Mr. H. S. Chorley, M.A., F.R.I.B.A.

Saturday, November 24.

GLASGOW TECHNICAL COLLEGE (Scientific Society).—Mr. W. Francis Goodrich, A.I.M.E., F.I.S.E., on "1876-1906—A Review of Destructor Practice."

Tuesday, November 27.

ARCHITECTURAL ASSOCIATION OF IRELAND.—Mr. E. St. J. Lyburn, A.R.C.Sc.I., on "Irish Stone Quarries," at 8 p.m.

Wednesday, November 28.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Mr. Nichol Selkirk on "A Practical Talk on Building Stones," at 8 p.m.

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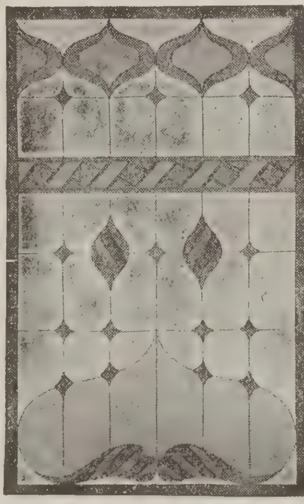

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FIREPROOF
FLOORS,
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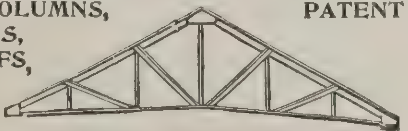
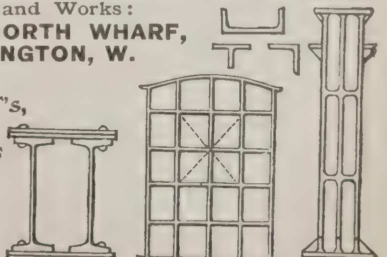
&c.



DELIVERIES FROM TOWN STOCK



Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, *Great New Street, Fetter Lane, E.C.*

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Bream (Glos.).—Accepted for the erection of an infants' school, for the Gloucestershire Education Committee. Mr. R. S. Phillips, architect, Shire Hall, Gloucester :—

Orchard and Peer, Stroud	£2,090	0	0

Cardiff.—For the construction of new roads, lanes, sewers, &c., on the Heathfield Estate, Gabalva, near Cardiff. Mr. Edgar G. C. Down, A.R.I.B.A., architect, 31, High Street, Cardiff. Quantities by the architect :—

J. S. Shepton	£917	15	0
R. W. Hunter & Co.	890	19	4
D. Rose	790	15	5
J. B. Mundy	790	13	8
Hatherley & Co., Penarth	783	0	0
F. Ashley	769	12	7
T. Walker, Clydach	762	4	0
A. G. Collins & Co., Barry	754	19	6
Wm. Brown, Merthyr	747	16	0
W. Thomas & Co.	729	0	0
Barnes, Chaplin & Co.	658	6	8
Mackay & Davies	655	13	11
Eli Rees, Whitchurch	596	10	10
F. C. Williams*	575	0	0

(Of Cardiff except where otherwise stated.)

*Accepted.

London, S.W.—For the erection of a secondary school for 510 girls at Dawes Road, Fulham, for the L.C.C. Mr. T. J. Bailey, architect (Education) :—

Lathey Bros, Battersea Park	£32,142	0	0
Waring White Building Co. Ltd., 1a, Cockspur Street	30,304	0	0
McCormick & Sons, Essex Road	20,270	0	0
W. Downs, Walworth	£29,983	0	0
Holloway Bros. (London), Ltd., Belvedere Road	29,978	0	0
G. Godson & Sons, Kilburn Lane	29,600	0	0
Spencer Santo & Co., Westminster	29,507	0	0
Leslie & Co., Ltd., Kensington Square	29,008	0	0
H. Lovatt, Ltd., Wolverhampton	28,793	0	0
Patman & Fotheringham, Ltd., Islington	28,683	0	0
W. King & Son, 3, Vauxhall Bridge Road	28,524	0	0
C. J. Kearley, 4, Great Marlborough Street	28,315	0	0
C. Wall, Ltd., 4, Lloyd's Avenue	28,021	0	0
J. Grover & Son, New North Road	27,933	0	0
L. Whitehead & Co., Ltd., Clapham Road	27,865	0	0
E. Lawrence & Sons, City Road	27,741	0	0
Treasure & Son, Upper Holloway	27,312	0	0
W. Johnson & Co., Ltd., Wandsworth Common	27,260	0	0
J. Garrett & Son, 83, Balham Hill	26,554	0	0
J. & M. Patrick,* Point Pleasant, Wandsworth	26,139	0	0

Architect's estimate, £32,006.

*Recommended for acceptance.

Long Eaton.—For the erection of bakery, stabling, &c., for the Long Eaton Working-Men's Co-operative Society. Messrs. Ridgway & Smith, architects, Long Eaton :—

Contract No. 1.—Builders' work.

E. L. Hanford, Nottingham	£11,465	15	0
J. Lewin, Netherfield, Notts.	10,930	0	0
T. Barlow & Co., Nottingham	10,825	0	0
Dennett & Ingle, Nottingham	10,750	0	0
Scurr & Jowett, Barrow-on-Soar	10,375	0	0
Hutchinson & Son, Nottingham	10,300	0	0

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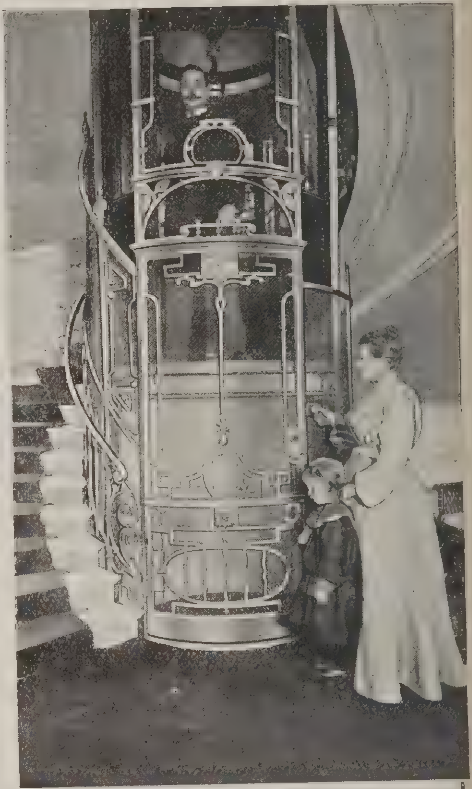

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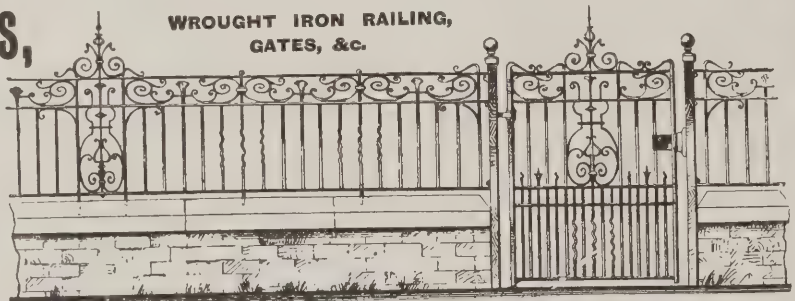

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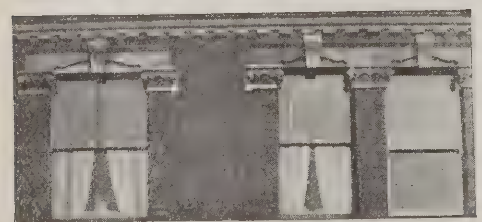

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Terra Cotta Works,
CLEETHORPES,
FOR NEW CATALOGUE OF . .
WINDOW & DOOR HEADS,
TRUSSES, CORBELS, FINIALS,
CHIMNEY POTS, VASES,
MOULDED BRICKS, &c.

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INVENTED BY
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PLUMBERS & IRONMONGERS
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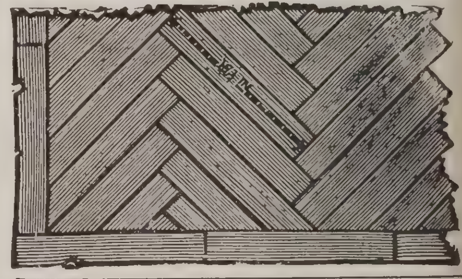
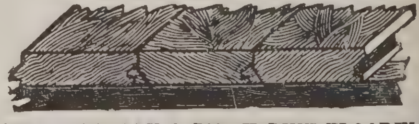


FLOORING BLOCKS
Prices upon application for Yellow Deal, Oak and Pitch Pine



PRIME DRY OAK & PITCH PINE FLOORINGS
With Special Joint to conceal Nails—
1¼ × 4 Oak, 56/9
1 × 4 " 45/-
Pitch Pine { Prices on application
These prices do not include desiccation.
VIGERS BROTHERS,
TIMBER MERCHANTS,
Only Address—67, KING WILLIAM STREET, E.C.
Telephone Nos. 601 and 602 Avenue.

T. W. Youngman	£9,800	0	0
J. Brown & Son	9,538	0	0
F. Perks & Son*	9,097	0	0

Architect's estimate, £9,929.

Contract No. 2.—Steel and iron work.

W. A. Baker & Co., Newport, Mon.	1,953	19	8
B. Smith & Co., Glasgow	1,766	5	0
Marple & Gillott, Sheffield	1,751	5	0
Cross & Cross, Walsall	1,733	0	0
Redpath, Brown & Co., Manchester	1,721	6	0
Bagshaw & Sons, Batley	1,610	15	0
Gimson & Co., Leicester	1,590	3	0
Lambourne & Co., Manchester	1,569	0	0
Goddard, Massey & Warner, Nottingham	1,562	2	6
Cort, Paul & Cornick*, Leicester	1,497	4	11

Architects' estimate, £1,475.

Contract No. 3.—Plumbing and glazing work.

C. H. Coffee, Nottingham	980	0	0
Kettering Co-operative Builders	966	0	0
Cooper & Berrie, Notitngham	835	0	0
W. J. Flower & Co., Leicester	827	14	0
S. Farmer	819	10	0
F. Perks & Son*	810	0	0

Architects' estimate, £850. Rest of Long Eaton.
*Accepted.

Milford Haven.—For the erection of two houses in Robert Street. Mr. C. Launcelot Blethyn, architect:—

R. Thomas	£832	0	0
Lloyd & Co.	769	0	0
Phelpp & Owens	747	10	0
Cole & Sons	730	0	0
S. Scott	700	0	0
V. Thomas & Williams*	576	0	0

*Accepted.

Poole.—For the erection of a secondary school for 200 scholars at Selddown, for the Poole Education Committee. Mr. Walter Andrew, architect, Parkstone:—

W. E. Jones & Sons, Bournemouth	£5,600	0	0
C. Trask & Sons, Stoke-under-Ham	5,498	0	0
Jenkins & Sons, Bournemouth	5,358	0	0
G. A. Drake, Bournemouth	5,350	0	0
A. & F. Wilson, Parkstone	5,297	0	0
Burt & Vick, Poole	5,245	0	0
S. Whitaker, Bournemouth	5,197	0	0
George & Harding, Bournemouth	5,075	0	0
Baker & Pearcy,* Parkstone	4,932	0	0
J. T. Harris,† Wycombe	4,573	0	0

*Accepted subject to reductions.
†Withdrawn.

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—adjudication.]

During the week ending Nov 16th eighteen failures in the building and timber trades in England and Wales were gazetted.

T. Jones, builder, Liscard. R.O., Nov. 7.

J. Morris, builder, Fulham and Pimlico. Adj., Nov. 7.

R. Williams, painter and decorator, Trefriw. R.O., Nov. 8.

Kerslake & Son, builders, Exeter and Okehampton. R.O., Nov. 6.

H. Scott, timber merchant, Derby. P.E., Derby C.C., Dec. 11, at 11.

J. F. Wridgway, carpenter and joiner, Kidderminster. R.O., Nov. 8.

J. Ringrose, builder and contractor, late Stanningley. Adj., Nov. 7.

Hicks & Son, builders, Brislington. Liabilities, £279; deficiency, £284.

Marriott & Salter, builders and contractors, Caterham Valley. R.O., Nov. 6.

H. C. Goss, builder, Torquay. Liabilities, £2,410; assets, £1,895; deficiency, £515.

S. Barr, builder, Chelsea, P.E., London Bankruptcy Court, Dec. 12, at 12. R.O., Nov. 7.

J. E. Hardwick, joiner and builder, Spital. Liabilities, £1,342; assets, £496; deficiency, £845.

C. Gradden, builder, Sutton. First meeting, 132, York Road, S.E., Nov. 23, at 1. P.E., Croydon C.C., Dec. 5, at 11.

G. Horn, builder, Enfield. First meeting, 14, Bedford Row, W.C., Nov. 22, at 3. P.E., Edmonton C.C., Dec. 3, at 11.30.

G. E. Chick, carpenter and builder, Cheltenham. First meeting, Cheltenham C.C., Nov. 22, at 2.45. P.E., same, Nov. 29, at 12.

D. T. Carter, builder, Chingford. First meeting, 14, Bedford Row, W.C., Nov. 22, at 12. P.E., Edmonton C.C., Dec. 3, at 11.30.

T. Horner, joiner and builder, New Cleethorpes. First meeting, O.R.'s, Great Grimsby. Nov. 21, at 12. P.E., Town Hall, Great Grimsby, Dec. 13, at 11.

T. P. Williams, builder, Norton-on-Tees. P.E., Stockton-on-Tees C.C., Nov. 21, at 10.30. First meeting, O.R.'s, Middlesbrough, same day, at 3. Adj., Nov. 9.

T. R. Brice & Co., builders, Chingford. First meeting, 14, Bedford Row, W.C., Nov. 21, at 12. P.E., Edmonton C.C., Dec. 3, at 11.30. R.O., Oct. 22 (amended notice).

J. Burton, timber and veneer merchant, London, Liverpool and Watford. First meeting, London Bankruptcy Court, Nov. 23, at 1. P.E., same, Dec. 19, at 11.30. R.O., Nov. 7.

Contracts Open.

COUNTY BOROUGH OF BURNLEY.

EDUCATION DEPARTMENT.

PROPOSED TECHNICAL SCHOOL.

THE EDUCATION COMMITTEE are prepared to receive Tenders for the various works required in the erection of the proposed Technical School in Ormerod Road, Burnley.

Drawings may be seen and Specifications, Bills of Quantities, and Forms of Tender obtained at the Office of the Borough Engineer, Mr. G. H. Pickles, A.M.I.C.E., on payment of One Guinea, which will be returned on receipt of a *bona-fide* tender.

Tenders, endorsed "Tender for Technical School," and addressed to the Chairman of the Education Committee, must be delivered at the Town Clerk's Office, Town Hall, not later than 9 a.m. on Saturday, the 22nd day of December, 1906.

The lowest or any tender will not necessarily be accepted, and persons tendering must do so at their own expense.

E. JONES,
Clerk to the Education Committee.
Town Hall, Burnley,
November 6, 1906.

TENDERS for STORES.

The London General Omnibus Company, Ltd., invite TENDERS for the SUPPLY, during 1907, of the following STORES:—

- (*a*) Timber.
- (*b*) Ironmongery, Coachmakers', Engineers', Saddlers', and Farriers'.
- (*e*) Oil, Glass, Grease, and Sundries.
- (*f*) Coach Trimmings, Canvas, Sacks, and Horsecloths.
- (*g*) Leather and Machine Belting.
- (*h*) Brushes and Brooms.
- (*k*) Building Materials.
- (*l*) Gas and Water Fittings.
- (*m*) Enamelled Iron Plates.
- (*r*) Motor Accessories and Spare Parts.

The Schedules will be ready NOVEMBER 12 and may be obtained at the Company's Coach Factory, North Road. Caledonian Road, N., on payment of 2s. 6d. each, where samples will also be on view, NOVEMBER 14, 15, and 16, between the hours of TEN a.m. and FIVE p.m. Contractors are requested to call and examine the samples before Tendering.

Sealed Tenders, endorsed "Tender for Stores," should be addressed to THE DIRECTORS, 6, Finsbury Square, E.C., not later than NOON, NOVEMBER 26.

By Order of the Board,
R. T. KINGHAM,
Secretary.
6, Finsbury Square, London,
October 24, 1906.

TO CONTRACTORS.

Tenders are invited for the construction of roads and sewers on Heathfield Estate, Gabalfa, Cardiff. Plans and specifications can be seen and quantities obtained at the offices of the undersigned on deposit of £2 2s., which will be returned on receipt of bona-fide tender.

EDGAR DOWN, A.R.I.B.A.,
31, High Street, Cardiff.

Property & Land Sales.

FOR SALE, an old established Joiners' and Builders' Business in the North of England. Price for plant, stock-in-trade, &c., £500. Further particulars apply to F. Chappell, Auctioneer and Valuer, Huddersfield.

FREEHOLD PROPERTY, VALUABLE, for Sale by Private Treaty; situated in the North of England; comprising six Acres of Land, with Railway Siding from Main Line, and three large Warehouses, together with fully-equipped Cement Works in thorough working condition.—For further particulars apply to J. T. Heppel, 3, Scarbro' Street, West Hartlepool.

WOODFORD.—BUILDING LAND FOR SALE, about 244ft. of frontage to main road. Ripe for the erection of first class shops or can be rented on 99 years' lease. An opportunity to make a good market. Full particulars of F. M. Miles, architect, Woodford Lodge Estate, Fulham Road, S. Woodford.

To Land Companies, Builders, and Speculators.

FINCHLEY, MIDDLESEX (few minutes of electric tram route—a penny fare to Highgate Station).—Valuable FREEHOLD BUILDING LAND, possessing important frontages of over 3,000 ft., including 340 ft. to Long Lane (a parish road), and about 2,900 to proposed roads, comprising the whole of the remainder of the "Brownlow Estate," Squires Lane and Long Lane, suitable for immediate erection of small villas, for which there is an extraordinary demand in this particular part of the parish.—For SALE by AUCTION by

MESSRS. CHARLES SPARROW & SON (in conjunction with Messrs. J. Joslin & Co.), at the Torrington Hotel, North Finchley, on MONDAY, November 26, 1906, at SEVEN o'clock in the evening, in Eight Lots.

Particulars of Messrs. Aird & Hood, Solicitors, 4, Brabant Court, Philpot Lane, E.C.; Messrs. J. Joslin & Co., Estate Agents, East Finchley; and Messrs. Charles Sparrow & Son, F.A.I., Auctioneers and Surveyors, North and Church End, Finchley. Telephone: 30 and 111, Finchley.

If you are at the present time **Seeking a Situation** or if you wish to better your present position,

The "Builders' Journal" Employment Register

offers you exceptional facilities for making your requirements widely known.

Those who have used our columns when advertising for fresh berths have expressed the greatest satisfaction at the results they have obtained, and we append a letter received from one of them:—

"Kindly remove my name from your Employment Register. I am glad to say I have obtained a berth through its agency, for which I am obliged to you."

Every week—we might say every day—we get fresh evidence that employers consult the "Builders' Journal" Employment Register, and appended are a selection from the letters received lately.

A large firm of Builders' Merchants write:

"Referring to the 'Builders' Journal' Employment Register, will you ask No. 1585 to send us particulars of experience, salary required, &c."

A well-known F.R.I.B.A. writes:

"Kindly put me into communication with your advertiser, No. 1637, as soon as possible."

A large firm of provincial Architects write:

"Can you put the following advertisers into communication with us: 1649, 1652, 1654, 1660, 1681 and 1712, and oblige."

The above letters speak for themselves, and it only remains for you to give the Employment Register a trial, and below we give full particulars of the cost of making your requirements known.

For 3s. we give three insertions (four lines) in our "Appts. Wanted" Columns, and also 6 insertions in the "EMPLOYMENT REGISTER" (see page xxviii).

"PYTHO"
PLASTER
UNSURPASSED FOR INTERIOR WORK
Only two coats required.
Commenced and finished in one day.
Can be decorated at once.
As hard as Keene's Cement.
Costs about the same as lime plastering.
For further particulars write to
WOOD BROS.
Draycott in the Clay,
SUDBURY, DERBY.

Appointments Wanted.

The charge for Advertisements under this heading is 1s. 6d. per insertion not exceeding four lines, and 6d. per line afterward, prepaid. Three insertions may be had for the price of two. Advertisements must reach the Office not later than 5 o'clock on Monday.

ARCHITECT'S ASSISTANT DISENGAGED. 12 years' experience. Plans, specifications, quantities, levelling, surveying, &c. Excellent references.—Fox, "Rose Ferns," Westfield, Woking. 2180

ARCHITECT'S ASSISTANT (27) desires RE-ENGAGEMENT. Ten years' experience, school and general work; working drawings, details, levelling; moderate salary.—"D," 15, Queen Margaret's Grove, N. 2181

ARCHITECT'S ASSISTANT (Scotch); 14 years' good general experience; design working drawings, details, &c.; good references. Moderate salary. London preferred.—Box No. 2216, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT'S ASSISTANT (23) seeks ENGAGEMENT; working drawings, details, quantities, surveying, &c.; good draughtsman and excellent refs.—J. W. H., "Hou.eleigh," Ashgate Road, Chesterfield. 2215

ARCHITECT'S ASSISTANT (23) seeks RE-ENGAGEMENT; over 6 years' all-round experience; planning, quantities, surveys; neat draughtsman; excellent refs. Mod. sal. Student R.I.B.A.—Box 2211, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT'S ASSISTANT (23); 8 years country and London experience; student R.I.B.A.; excellent refs.—A. W. Wilson, 101, Hertford Road, East Finchley, N. 2219

ARCHITECT (29), wishing to purchase a practice, seeks a POSITION as ASSISTANT with view to superseding principal.—Box 2220, Builders' 6, Great New Street, London, E.C.

ARCHITECT'S AND SURVEYOR'S ASSISTANT requires SITUATION; all drawings, specifications, supervision; land surveying, quantities, good all round man.—Box 2161, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT'S JUNIOR ASSISTANT (21), Country and London general experience; Student R.I.B.A. Excellent refs.—H. J. Wilson, 101, Hertford Road, East Finchley, N. 2190

ARCHITECT AND SURVEYOR'S ASSISTANT, 9 years' London and Provincial experience, desires RE-ENGAGEMENT; design working and Competition drawings, perspectives and surveying; expert leveller. £2 10s.—Box No. 2188, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT & SURVEYOR'S ASSISTANT desires ENGAGEMENT; 6½ years' varied experience; London or Provinces; good refs. from London and country Architects. Salary 35s.—A.P., 46, Kenwyn Road, Clapham, S.W. 2203

ARCHITECT'S ASSISTANT requires SITUATION; 6⅔ years' country and London experience; good references, working drawings, details, etc., etc. Salary moderate.—Box 2187, Builders' Journal Office, 6, Great New Street, London, E.C.

ARCHITECT'S ASSISTANT desires SITUATION: served articles; good draughtsman; drawing from life; 5½ years' general exp.; good tests. and certs. Moderate salary.—Box 2206, Builders' Journal Office, 6, Great New Street, London, E.C.

ARCHITECT & SURVEYOR'S ASSISTANT (24), DISENGAGED; 7 years' all-round experience; abstainer; design prize-winner; moderate salary.—Box 2229, Builders' Journal Office, 6, Great New Street, Fetter Lane, London, E.C.

ARCHITECT'S JUNIOR ASSISTANT (21); 4½ years' varied experience; assist with quantities; good references.—G. Ewing Low, 72, St. Ann's Hill, Wandsworth, S.W. 2228

ARCHITECT'S ASSISTANT (25) DISENGAGED. Nine years' experience; good draughtsman, designs, working drawings, details, etc.; London or country.—W. A. N., 46, St. Augustine's Road, Camden Square, N.W. 2233

ARCHITECT'S ASSISTANT (25) desires ENGAGEMENT. Working drawings, details, perspectives, quantities, &c. Good designer and colourist.—Aubrey Pritchard, The Grove, Rhyl, North Wales. 2232

ARCHITECT'S JUNIOR ASSISTANT requires ENGAGEMENT. Neat draughtsman, tracer, colourist, &c. Specimens submitted. When writing state salary offered.—Apply J.E.T., 24, Asbourne Road, Mitcham, Surrey. 2227

ASSISTANT (25), Inter. R.I.B.A. Honours Building, Sanitary Medal; contract and detail drawings; specifications, measuring up, &c.; pen perspectives; moderate salary.—T. B., 22, Richmond Gardens, Shepherd's Bush, W. 2183

ASSISTANT (27), 12 years' first-class experience; passed final R.I.B.A.; design working, drawings, details, perspectives, specifications, supervision, quantities and general office work; salary very mod.—B., 85, Durham Road, East Finchley. 2223

BRICKWORK WANTED by rod or job, by experienced man. Would take charge. Good refs.—Box 2195, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

BUILDER'S AND DECORATOR'S ASSISTANT; Town or Country; quantities, estimating, accounts; out-doors supervision; draughtsman, shorthand; good general experience.—Box 2194, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

BUILDER desires a SITUATION in any capacity; would take entire charge of an estate, large or small, in any district and execute repairs; building or alterations; finding all tools and plant; highest references.—Lewis, 9, King's Parade, Isleworth. 2214

BUILDER'S ASSISTANT, age 33, seeks SITUATION; nineteen years' experience; well up in the various branches: first class references. —Address, Box 2208, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

BUILDERS' MANAGER or FOREMAN, capable of interviewing clients, measuring, estimating, setting out, and general supervision of outside jobs: last situation 9 years (London). Carpenter by trade.—Box 2192, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

CARPENTER and JOINER wants PIECE-WORK; any amount and description; labour only; low prices; good refs.—G., 200, Boundary Road, Walthamstow, Essex. 2212

CLERK OF WORKS desires ENGAGEMENT; past experiences: library, theatre, almshouses, factories, furnaces, steam boilers, heating, electric lighting, hydrants and sprinklers.—G. R., 17, Sweet Briar Walk, Upper Edmonton, N. 2213

CLERK OF WORKS wants RE-ENGAGEMENT; Town or Country; experienced and practical; excellent references and testimonials from Architects and Public Bodies.—T.H., 51, Bury Street, Lower Edmonton, N. 2191

CARPENTER, JOINER wants JOB. Bench, fixing or jobbing, or will take piecework any quantity; labour only; good testimonials.—H., 86, Alderney Street, Pimlico, S.W. 2225

CLERK OF WORKS; large and varied experience, thorough knowledge, labour, material and construction; leveller, draughtsman, and keen supervisor; at liberty.—J.M., 77, Welbourne Road, Tottenham. 2163

CLERK OF WORKS or GENERAL FOREMAN seeks RE-ENGAGEMENT, town, country or abroad; thoroughly experience home and abroad; good testimonials; age 35.—P. G., 428, Uxbridge Road, W. 2224

ESTIMATOR'S ASSISTANT (22), DISENGAGED; quick and reliable at figures; abstracting and accounts; used to large works, also time, wages, and general routine; good references.—A., 100, Hamilton Road, Wimbledon. 2230

GENERAL FOREMAN; capacity reliability; references from all employers from apprenticeship, including present employer and seven years with last.—G. A. Green, 112, Fulbourne Road, Forest Road, Walthamstow 2164

GENERAL OR WORKING FOREMAN (carpenter), new or alterations. o. management, good jobbing. Practical experience all branches, good manager of men; well-up in plans.—W., 29, Pollock Road, Walworth, S.E. 2205

GENERAL or WORKING FOREMAN DISENGAGED. In London or country. Twenty years' practical experience in new building and alterations. Trade, bricklayer. Age 43. Good references from last employers.—H.C., 5, Westbury Road, Paddington. 2226

IMPROVER to the Writing, Graining, Decorating, &c., wants SITUATION; age 21; just finished apprenticeship.—F. Clarke, 112, Cox Street, Coventry. 2186

PAINTER (good) requires WORK; young man, age 27; town or country; used to all classes of work; abstainer; state wages.—A.W.P., 19, Chesterfield Gardens, Harringay, Middlesex. 21

PLUMBER, good sanitary, lead laying, gas, hot-water, new or jobbing, wants EMPLOYMENT; any distance; age 33; wage 10d.—Plumber, 37, Theydon Street, Markhouse Road, Walthamstow, E. 2196

QUANTITY SURVEYOR'S ASSISTANT (22) desires ENGAGEMENT; 6 years' London experience working up and taking off; temporary or otherwise; London or Provinces; salary moderate.—Box 2165, Builders' Journal.

QUANTITY SURVEYOR'S ASSISTANT (21) desires ENGAGEMENT, temporary or permanent, working up and taking off. Excellent references.—Box W., Builder's Journal Office, 6, Great New Street, Fetter Lane, E.C.

SMITH, GAS & HOT WATER FITTER, Locksmith, Bell Hanger, Stove and Range fitter. Twelve years' experience in builders' work.—J. W., 41, Effra Parade, Water Lane, Brixton. 2193

TO QUANTITY SURVEYORS.—Assistant (30); quick, reliable, good London experience, taking off, measuring-up, expert worker-up, &c. Temporary or permanent; terms moderate.—Box 2169, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

Appointments Vacant.

CLERKS OF WORKS WANTED immediately for Hennebique Ferro-concrete Piling and Jetty Work. Must have had previous experience of this class of work. Probable duration of work, four months. Day and night work. State age, experience, salary required, and all necessary particulars.—Address, Hennebique, 18 Victoria Square, Newcastle on-Tyne.

TRAVELLERS, with connection amongst Architects, Local Government Authorities, and Corporations, are offered excellent side lines in Enamels, Varnishes, Paints, &c. Liberal commission—Box 2156, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

TRAVELLER, calling on Provincial Architects and Builders, to represent Midland firm, on commission; Ornamental Glass. Apply Box 2197, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

Drawings, Tracings &c.

AN ARTIST and DRAUGHTSMAN is prepared to undertake Architectural Drawings or Designs for manufacturing firms, either in office or at home. Perspectives, Illuminated Addresses, &c.—E.S.B., Box 1813, Builders' Journal Office, 6 Great New Street, Fetter Lane, E.C.

ARCHITECTURAL DRAWINGS, TRACINGS, &c., effectively executed by experienced Draughtsmen; very moderate terms.—Stone & Colquhoun, 6, York Buildings, Adelphi, W.C. 2189

ARCHITECT is prepared to undertake designs, working drawings, perspectives, &c.—Box 2204, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

ASSISTANCE rendered in the preparation of Architectural Drawings, &c., at advertiser's own address.—Box 1717, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

DRAWINGS from rough Sketches, Designs, Details, Specifications, Drain Plans and Quantities Prepared; terms moderate.—J. W., 8, Rylett Crescent, Shepherd's Bush, W. 2207

DRAWINGS prepared for Architects, Surveyors, &c.; sketch plans, working drawings, details coloured and finished complete. Specimens produced if desired. Terms 1s. per hour or by agreement.—Mac, 190, Alexandra Road, St. John's Wood, N.W. 2177

PERSPECTIVES AND ELEVATIONS, Pencil, Ink, Monochrome or Colour. Hart & Coxon, 14, Clifford's Inn, Fleet Street, London, E.C. Established 14 years. Specimens sent.

"PRACTICAL STENCIL WORK."—A Guide to Designing and Cutting Stencils and executing stencil work for all purposes. Illustrated by many examples of ornamental stencil designs. Just Published. 3/-. "PRACTICAL GILDING, BRONZING AND LACQUERING," 3/-. Prospectus free. "The Decorator" Office, 365, Birkbeck Bank Chambers, London, W.C.

QUANTITIES AND SPECIFICATIONS ESTIMATES. (Nominal fee if unsuccessful). Experienced General Assistance, Competitions, Designs, Contract, Detail, and Working Drawings—Address, Quantity Surveyors, 21, Liverpool Street, E.C.

SEE PAGES XXVII AND XXVIII FOR EMPLOYMENT REGISTER.

THE BUILDERS' JOURNAL
AND ARCHITECTURAL ENGINEER.

November 21, 1906.

FIRE SUPPLEMENT (MONTHLY).

FIRES IN PLACES OF PUBLIC WORSHIP.

The destruction of Selby Abbey by fire is a matter of national regret. With this fire many old associations are swept away, not only for the residents in the neighbourhood, but for many interested in architecture and archæology throughout the Kingdom.

Another fire during the year also calls for remark—namely, the destruction of the St. Michael's Church at Hamburg, a famous landmark in Northern Europe well-known to all who visit the Continent, and more particularly to Americans who travel by way of Bremen or Hamburg. Here again many interesting relics have disappeared with the destruction of the church.

In the case of Selby Abbey we have a fire of what we should term a very ordinary description. It was probably the result of negligence. The edifice being situated as it was the fire was a self-contained one—*i.e.*, it did not affect neighbouring buildings. From a fire service point of view there was little of interest in connection with the burning of the Abbey, for modern means and methods would scarcely be attempted in that district, and if they had been available we are afraid that, as at Hamburg, they would have been futile.

The Hamburg fire, however, is an instance of a highly instructive character, for here we have a high church steeple catching fire, destroying the church, and causing most serious damage in a thickly populated adjoining district, regardless of the fact that it was possible to bring to bear upon it a highly-efficient fire brigade, equipped with considerable steam fire-engine power, and officered by one of the smartest fire chiefs in Europe.

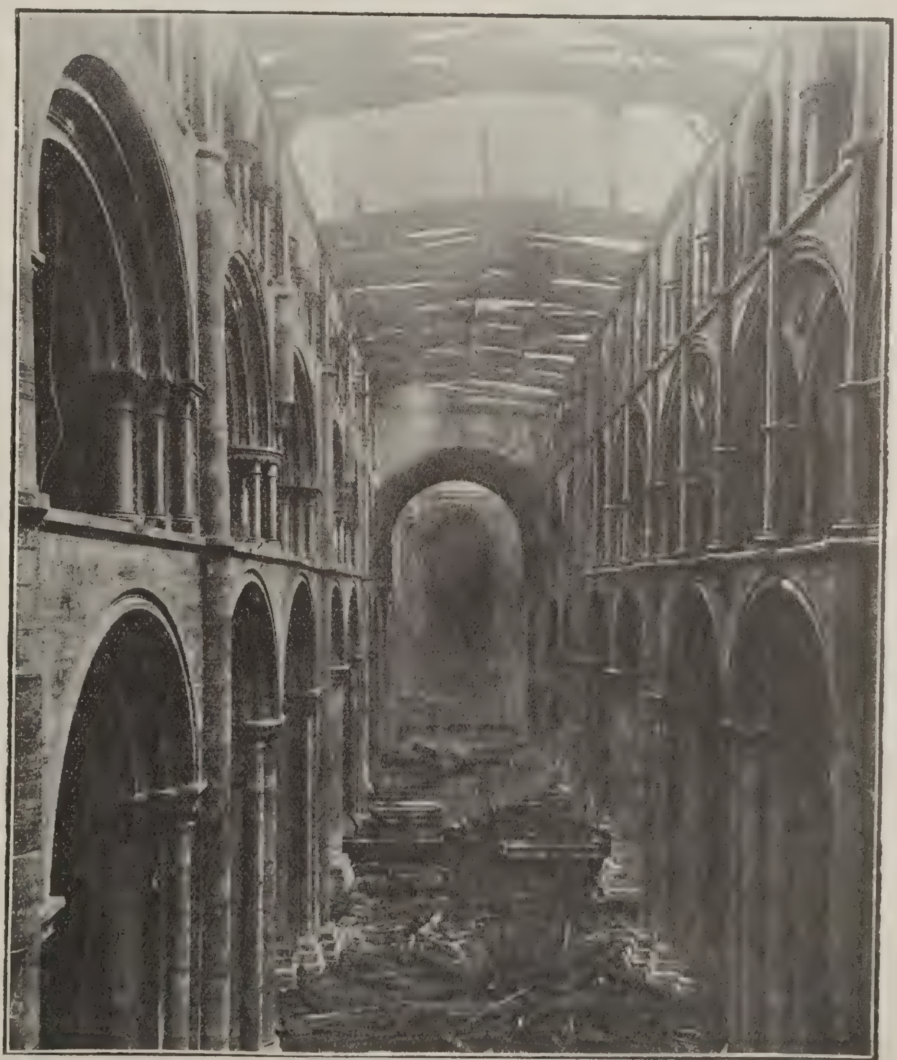
It is obvious to all that there must always be a certain danger from fire and panic in our churches, old and modern alike, during the winter months when the heating appliances are at work, and this has been added to by the increasing popularity of greater artificial illumination than was customary in days gone by. But if a place of worship has been fully recognised by those in authority as a place of hazard to life in case of fire, owing to the possibility of panic, a church has rarely been looked upon as a source of danger to surrounding property. The question of peril to life can be discounted to a great extent by suitable exits with doors properly hung outwards, although we regret to say that by far the majority of our churches are still veritable death-traps in respect to exit facilities. But to look upon a place of worship as a source of danger to surrounding property is certainly something new, and it required the example of the Hamburg fire to make us fully realise that the risk can under some circumstances be very considerable.

As we have indicated above, the Selby fire provides but little that is of value from the technical point of view, and the absence of suitable detailed records precludes our presenting particulars as to the exact progress of the fire.

But in Hamburg—that centre of scientific fire protection—where the annual fire loss has been reduced from year to year in a most extraordinary manner, the necessary data are forthcoming, and we are indebted to the Chief Officer, Herr Westphalen, not only for the valuable photographs which we reproduce, but also for the diagrams and an excellent description which has been issued in the form of his detailed report referred to later.

Selby Abbey Fire.

An enquiry into the circumstances of the fire by which Selby Abbey was partially destroyed on the night of October 19-20, has been held by the Bishop of Beverley, as Archdeacon of York, and Lord Wenlock and Mr. E. C. Brooksbank as assessors. From their report it appears that the fire was first noticed about 12.15, and "there appears to be no doubt whatever that the fire originated in the organ or its immediate proximity." The Lathom Chapel (in the north choir aisle) served as the organ chamber. The organ builder and two assistants had been employed in the organ on the night of the fire. One assistant left at 8 p.m., and the organ builder stated that he and the remaining assistant finished work at 10.30 p.m. They then put out all the gas lights in the Abbey, and removed the wax candles, three in number, which they had been using *in* the organ. Two of these were then extinguished. They spent about 20 minutes more, partly in the blowing chamber, partly in and about the organ, and then, extinguishing the last candle, they left the church and locked the door. On two occasions when the organ builder came into the church from the outside he perceived a slight smell of burning, and his assistant noticed it also. It was in



INTERIOR OF SELBY ABBEY AFTER THE FIRE, LOOKING EAST.

the north aisle of the nave, which is separated from the organ chamber by the whole breadth of the north transept. They endeavoured, without success, to discover the cause of this smell.

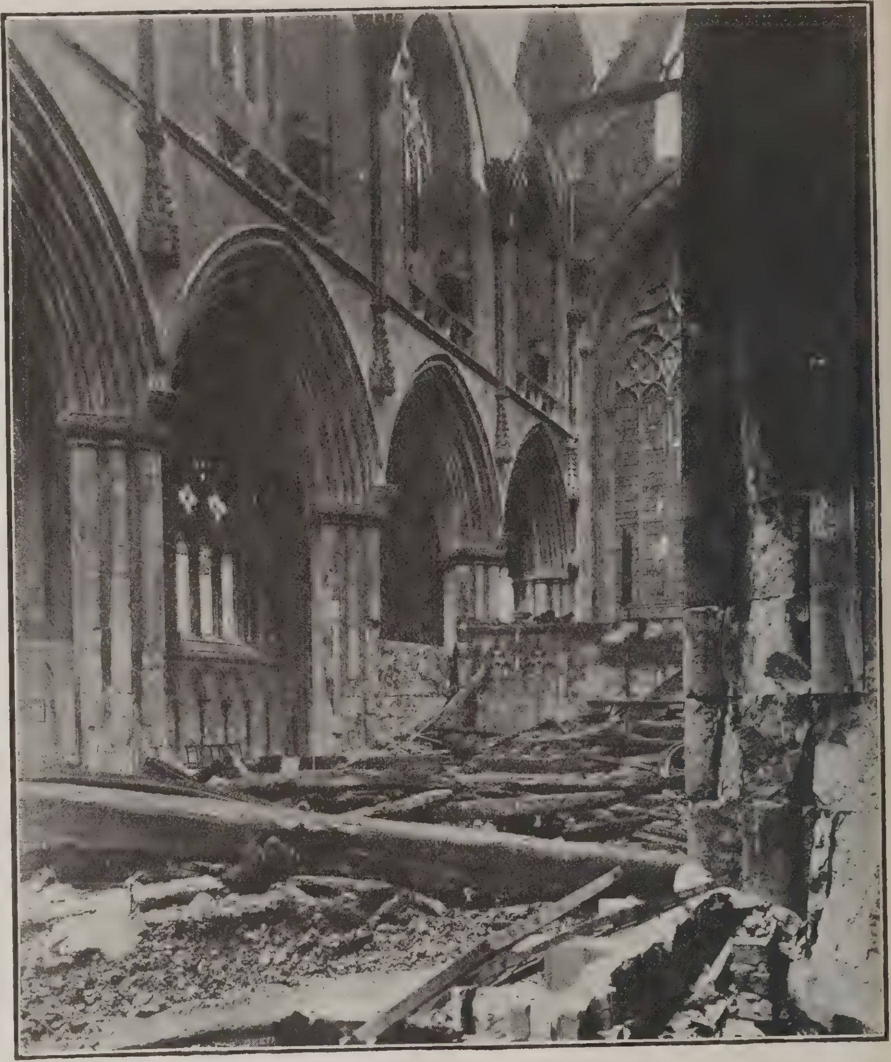
The assessors state in conclusion that they are unable to say in what precise manner this disastrous fire originated. But they feel it their duty to draw attention to certain conclusions which follow necessarily from the evidence. These are:—

"1. They cannot insist too strongly on the need for greater care in the employment of lights within an organ. The evidence in regard to the paraffin lamp and the fact that candles exposed to draughts were used without any protection in an organ largely constructed of perfectly dry wood are both significant. It is said that organ builders always use unprotected candles. But a practice is not the less dangerous because it is customary, and if it is dangerous it is reprehensible. It should be added that much greater caution ought to be used in regard to the possesion of matches by persons engaged in the building or repair of organs.

"2. The circumstances of the fire show how absolutely important it is that means of access to the Abbey should be obtainable close at hand at all times. Much valuable time was lost in getting at the fire because the verger, who had the keys, lived at a considerable distance from the church.

"3. Again, if after the discovery of the lamp in August (it was stated in evidence that this had been left alight in the organ all night) the precaution had been taken of keeping some one in charge of the building during the night as well as during the day until this somewhat dangerous work was completed, the fire would probably not have occurred.

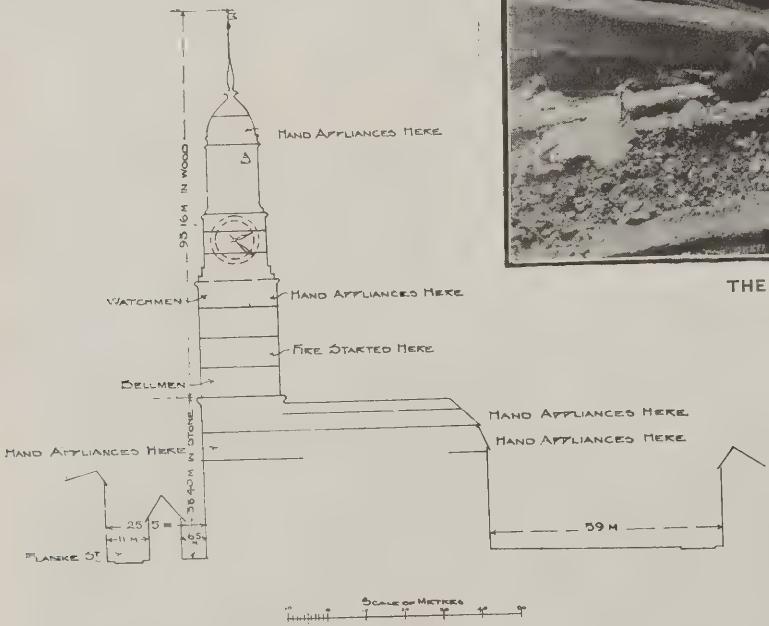
"4. It appears to us to be absolutely essential that when work of any kind is being done in or about the Abbey some responsible official should always inspect the premises thoroughly after the workmen have left the building."



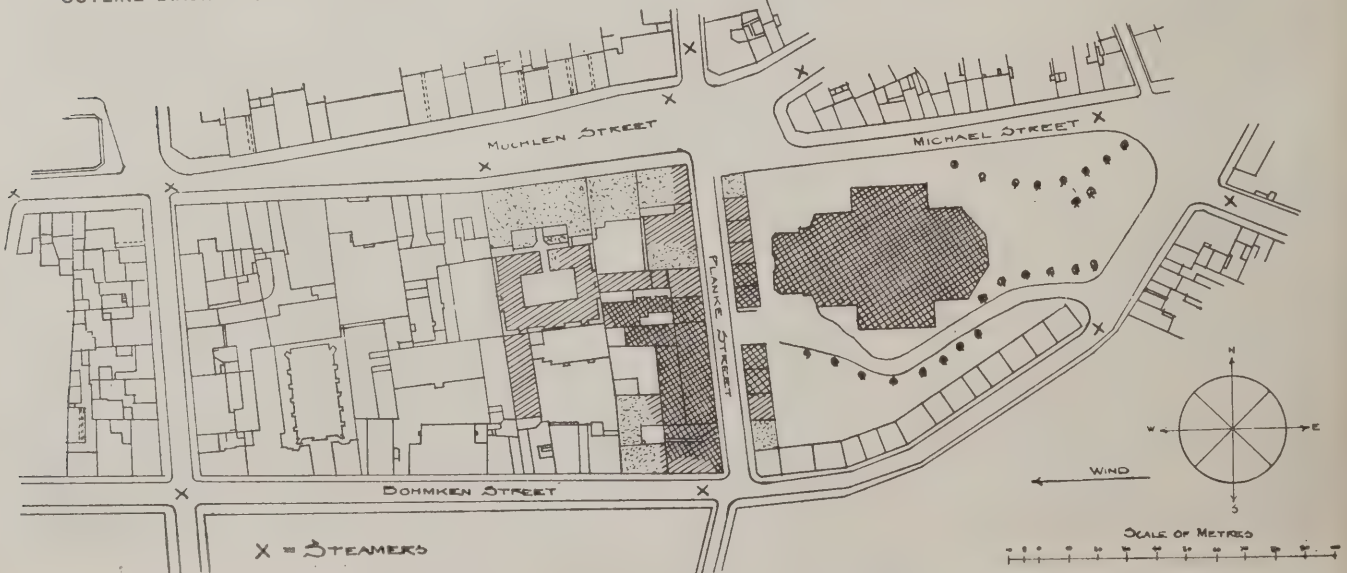
THE CHOIR, SELBY ABBEY, AFTER THE FIRE.

St. Michael's Church Fire at Hamburg.

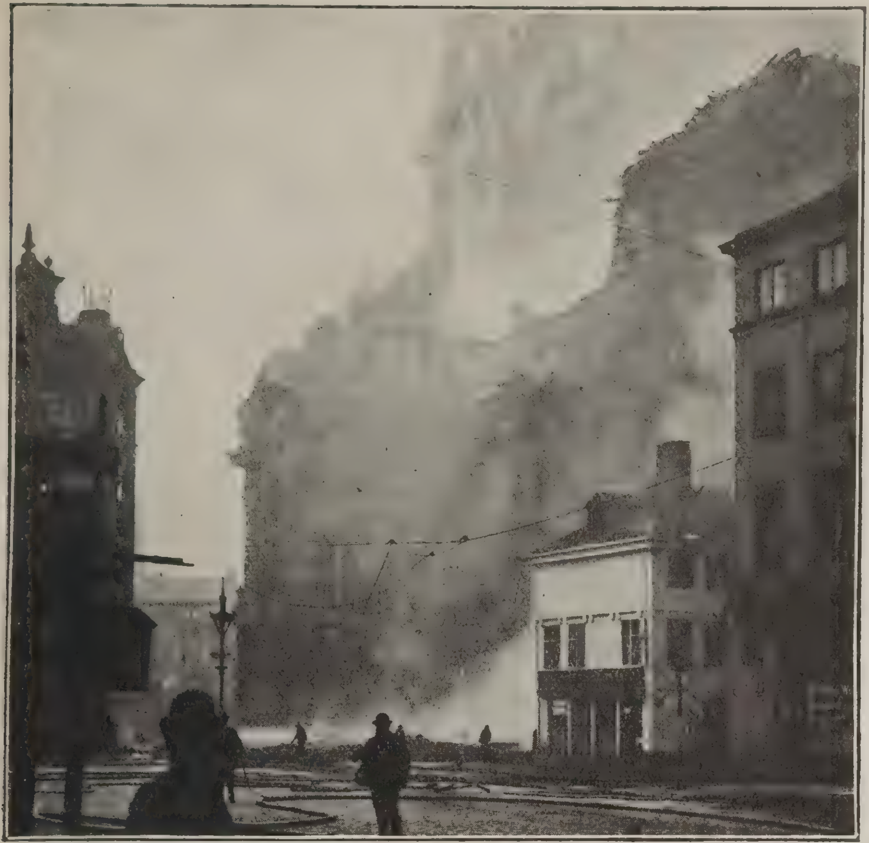
The fire was first made known to the Chief of the Fire Brigade at 2.22 in the afternoon by the arrival of a Morse telegraph message from the top of the spire of the church in question, on which there was permanently stationed a fire watch comprising a day and night watchman, both firemen, and whose duty it was to use the tower as a look-out for the Hamburg area. Translated this



OUTLINE DIAGRAM OF ST. MICHAEL'S CHURCH, HAMBURG.



PLAN OF ST MICHAEL'S CHURCH FIRE AT HAMBURG.



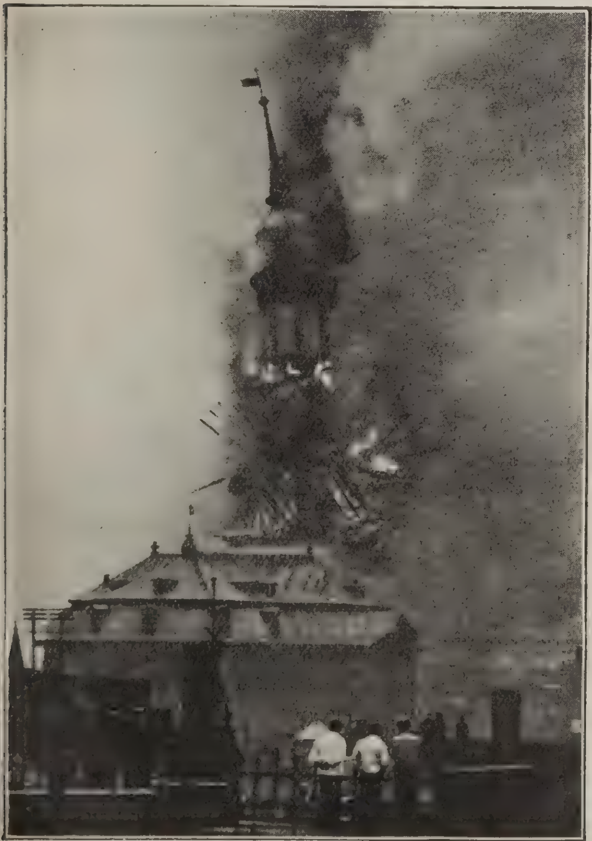
ST. MICHAEL'S CHURCH, HAMBURG, AT THE CONCLUSION OF THE FIRE.

telegram reads as follows:—"Brigade call to tower here." And we would add this was the last message of the day watchman, who died at his post after wiring to the fire brigade headquarters.

A considerable proportion of the brigade on arriving was immediately concentrated on this fire—*i.e.*, eight superior officers, 273 men, 11 steamers (of which five were very large ones), supplemented later on—when there was a possibility of the water supply giving out—by a large float which served as a feeder from a considerable distance.

The work of the fire brigade from the very outset was much hampered by the absence of suitable police arrangements, the majority of the police having been drafted to another district of the city for the reception of Royalty, and for this reason a proportion of the brigade had to be utilised in keeping the crowd back, and also in clearing the tenements on the adjoining property of their inhabitants.

On the arrival of the brigade it was found that the timber tower was well alight at and above the level indicated on the diagram as the bellman's section. An immediate attack was made on the burning building by squads of men under assistant divisional officers. But when the chief came upon the scene the situation was such that these squads had to be withdrawn with all celerity, leaving part of their tackle on the ground. It was obvious to the chief (whose former knowledge as an architect in private practice, and afterwards as a building surveyor, stood him in good stead on such an occasion) that the collapse of the wooden portion of the steeple was imminent, and, what was more, that having regard to the direction of the wind, the steeple would probably so fall as to set alight a considerable portion of the property on the lee side, including a large co-operative stores building. The whole efforts of the brigade were therefore concentrated on preparing for the fall of the steeple, to be in readiness to attack the impending outbreak on the surrounding buildings, and to get to work inside the church the moment the steeple had fallen.

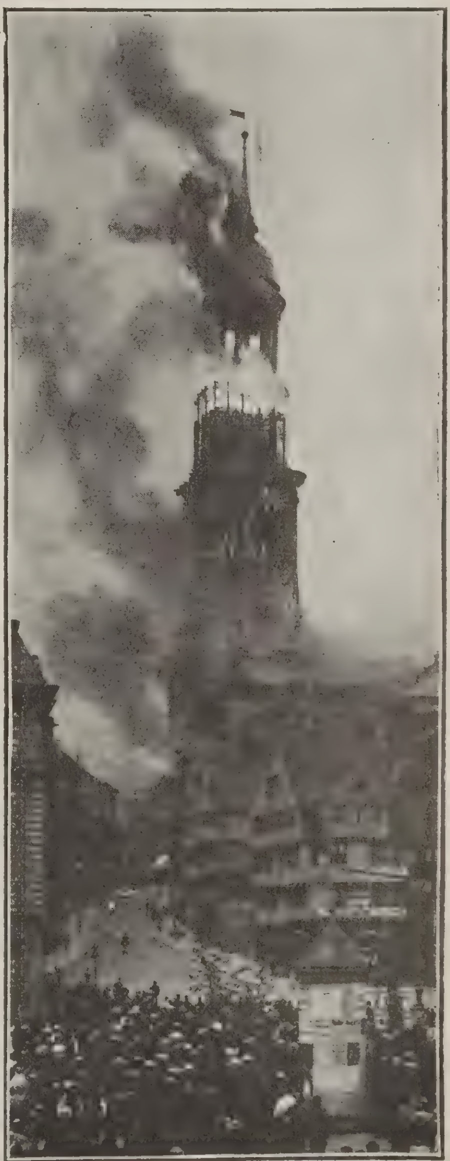


ST. MICHAEL'S CHURCH SPIRE FALLING.

The Spire Collapses.

The collapse of the spire took place at seven minutes past three, some of the main supports on the west side of the steeple already having given way at three p.m. The photograph published on this page gives an excellent representation of the actual fall of the steeple, and is probably one of the finest photographs of its kind.

The final collapse appears to have taken the form of a vertical spreading outward and falling in all directions, whilst the top of the spire fell W. by S.W., toppling over in that direction. The collapse involved a fall of something like 240,000 cu. ft. of timber from heights varying from 120ft. to 350ft. Very few people can, of course, realise what the sudden giving way of that amount of burning timber really means, and to what extent damage must be wrought, not only by fire but impact. Although the roof of the church was badly damaged by the collapse of the eastern side of the spire on



THE CONDITION OF ST. MICHAEL'S CHURCH SPIRE SHORTLY AFTER THE COMMENCEMENT OF THE FIRE.

to its top, a very plucky effort was still made to prevent its destruction, but the brigade was only able to keep the fire on the roof in hand for a sufficiently long time to permit of most of the valuables and relics in the church being saved, in itself, however, a feat of considerable risk.

The Damage to Surrounding Property.

The sketch plan shows the destruction wrought to adjoining property. The buildings cross-hatched were entirely gutted; those hatched from right to left being materially damaged; and those that are stippled being slightly damaged. The points X show the concentration of the steam fire engines, which were situated, as will be seen, almost entirely in positions from which they could be brought to bear upon the lee side. The back of the fire on the adjoining property was not broken until 7.30 p.m., and it continued throughout the night, the majority of the brigade being at work for a consecutive 12 to 13 hours. The amount of water utilised on this outbreak amounted to eighty-seven hundred cu. metres, as much as the average amount of water used by the brigade during any one of the last five years. 35,000ft. of hose were in use.

Interference of the Public.

We made some reference regarding the difficulty of getting the police to keep the ground on such an exceptionally dangerous occasion, and it may be of interest to know that the real concentration only took place after the collapse of the tower, when it had eventually to be supplemented by some 200 infantry in order to protect the neighbouring property from theft.

Besides the fireman on watch duty in the tower, who was killed after he had given the alarm, there was only one other fatality, the stoker in the co-operative stores, referred to above, meeting his death through being caught in a cellar.

As to the outbreak of the fire, it was apparently caused by two plumbers who were occupied on the zinc work about 35ft. below the watchman's room, and were soldering the copper sheathing without removing it from the separating woodwork, some inflammable material having been placed between the sheathing and the woodwork with a view (*sic*) of reducing the possibility of ignition. The inflammable material was a tarred piece of paper. The two plumbers, it would appear, immediately bolted, but a clockmaker, who was attending to the clock in the steeple at the same time, upon the discovery of the fire first assisted the fireman in his attempt to extinguish it with the hand appliances that were available. Upon the fireman and watchmaker finding their efforts futile, the fireman again ascended to the top of the steeple to give the alarm, whilst the watchmaker got out below. It is probable that upon the alarm being given, the fireman again attempted to extinguish the fire until his means of escape were unfortunately cut off.

The National Fire Brigades' Union are contemplating transferring their headquarters from Guildford to London, and an influential sub-committee of that body has been entrusted with the consideration of a suitable programme. There can be no doubt that the transference of the Union's offices to the capital city of the Empire would be most beneficial, both in the interests of fire protection and the fire-service generally.

SAN FRANCISCO EARTHQUAKE AND FIRE.

Since we commented upon this earthquake and the resultant fire on an earlier occasion, many contributions on the subject have been published, for the most part, in the United States. The majority of these have been issued in the interests of specialist firms, such as concrete (plain and reinforced) or terra-cotta specialists, each naturally wishing to indicate the particular excellence of the quality of the materials in which they are interested. Of these numerous publications one, however, stands out from the others from a technical standpoint. It was issued by the Roebling Construction Co., and prepared for that firm by Mr. A. L. Himmelwright, M.Am.Soc.C.E., and a summary of this paper we publish herewith.

We would point out that this report has been written in the interests of a company primarily associated with steel-frame buildings and concrete floors, as distinct from terra-cotta floors and from reinforced concrete construction, but the case has been put in such a way, and the conclusions arrived at form such interesting reading, that we feel this to be an instance where it must rank as an important contribution to the literature of the subject.

In reading the conclusions arrived at, it would probably be well to note immediately that in the United States it is common to differentiate between buildings as Class A and Class B, according to their efficiency for fire resistance, the one being the non-fireproof buildings, and the other the so-called fireproof buildings. We are not able to give the general conclusions quite in full, but we present them very nearly so, only omitting the lessons as regards earthquake shock.

THE LESSONS OF THE DISASTER.

A. L. Himmelwright, M.Am.Soc.C.E.

By adopting the good, discarding the bad, and supplying the omissions, there should be in the future no difficulty in planning and erecting buildings that will be actually fireproof. The best modern practice in the design of the foundations, the exterior walls and the steel skeleton structure is entirely satisfactory. A few details can be improved, but generally these features of the tall building fulfilled the requirements. The problem of making these structures fireproof has, by the recent conflagration, been narrowed down to two principal features or details in their construction: (1) protection of the openings in the exterior walls, and (2) protection of the columns in buildings which are to become receptacles for large quantities of combustible contents.

The glaring omission of the fireproof barriers for the exterior openings was the direct and sole cause of the damage and destruction to the interiors of nearly all the fire-proof buildings. This detail in the present stage of fire-proof construction is of paramount importance and should receive special attention in all future buildings. It is manifestly idle to claim that any building is fire-proof so long as the window and door openings in the outside walls are unprotected by some efficient fire-resisting device.

The insufficiency of the usual practice in regard to column protection was shown in many instances, and is an important development of the recent conflagration.

The definite and exact information on this subject that is now available should be of great value in the economical designing of future buildings.

To summarise and recapitulate, the lessons of the conflagration and the earthquake are given in the order of their importance as follows:—

I. Protect Openings of the Outside Walls against the "External Fire Hazard."

This is the predominant and most important lesson of the fire. As in the case of the Baltimore fire and other recent conflagrations, the flames were communicated to the fire-proof buildings from the outside through the windows and doors. Had suitable devices been provided in the window and door openings, the interiors of these buildings would have been wholly preserved, and the necessary repairs would have been limited to the restoration of the spalling and other damage to the exterors.

There are now available practical devices to safeguard such openings. Metal, or metal covered frames and sashes, wire-glass glazing and inside and outside metal shutters are to be had in great variety of design and finish. Similarly, metal and metal-covered door frames and doors are available to protect the door openings. The National Board of Fire Underwriters can furnish definite and detailed recommendations for specific cases.

An independent water supply, which can be provided by a tank on the premises, with suitable equipment, is also a desirable adjunct to protect the interiors of buildings.

II.—Protect the Columns and other important structural members in proportion to the requirements.

The results of this fire have shown conclusively that the ordinary and accepted methods of protecting columns are insufficient in the case of large stores, lofts, warehouses and similar buildings where large quantities of inflammable material are to be stored. Concrete, well anchored with interior anchors attached to the columns at intervals of 12 ins. to 18 ins. showed the best results as a protecting material.

For office buildings, hotels, institutions and buildings of similar character, a protection 2ins. thick of this material is sufficient. A double layer of wire lath and plaster, with an air space between, or 4-in. hollow tile blocks laid in cement mortar, with the space between the blocks and the column filled solidly with concrete or mortar, will also fulfil the requirements. For stores, warehouses, depots and similar buildings, the thickness of the concrete protection should be increased to 4ins. Common brick, 4 ins. thick, laid in cement mortar with the space between the brick and the column filled solidly with concrete or cement mortar, will also provide suitable protection. For exceptionally severe requirements the thickness of the concrete and the brickwork should be increased, respectively, to 6ins. and 8ins.

In all cases, whether the protection be of concrete, brick, hollow-tile blocks or metal-lath and plaster, it is most essential, in order to ensure good efficiency, that it be securely anchored to the columns at not less than four points in the perimeter and every 12ins. to 16ins. of the length of the column. If such anchors are not provided, unequal heating, the expansion of the column and abnormal stresses and strains are liable to crack the protection and cause it to fall away, no matter how thick or excellent the protecting material may be.

Girders should be similarly and equally protected, concrete being the most efficient and readily adaptable material for this purpose. The beams, while less important members in the steel design, should nevertheless have a protection of approximately one-half of that of the columns and girders in each case.

Suitable protection should be provided for wall girders in cases where the soffits are near the heads of window openings. There were many instances where the wood frames were built directly against the under side of the wall girders, the deflection and bulging of which caused considerable damage to the walls. The neglect in certain cases to protect the steel framing around openings in the fire-proof floors also caused abnormal deflection and bulging to such an extent as to permit the floor spans adjoining the openings to fall out. The failure of large trusses supporting roofs, which frequently wrecked large portions of the interiors of buildings, was also caused by inadequate protection.

III.—Use Refractory Materials for the Facades.

Granite, marble, sandstone, limestone and similar building stones again proved unsatisfactory materials for exterior ornamentation when exposed to fire. All these stones scaled and spalled, and were in many cases so badly damaged as to require entire renewal. These stones are also unsuited for bases, columns, lintels, caps, &c., to support loads in locations above ground where they may be exposed to fire.

Pressed silica brick and terra-cotta brick, made in the size of common brick, withstood the fire in San Francisco better than any other ornamental material. Pressed common brick also proved refractory and gave good results.

Ordinary terra-cotta, with thin shells and webs, while more refractory than the building stones mentioned, failed in numerous instances and gave satisfactory results only in cases where the material was made and erected with care and where the shells or walls were two inches or more in thickness. This material when used should be provided with efficient anchors to hold it in position.

Common brick, when laid in cement mortar, also made an excellent showing and can be depended on to form a complete and efficient barrier against fire. In all cases where facing bricks are used, at least every third or fourth course should be securely bonded to the backing.

IV.—Select a Concrete Floor Construction of Recognised Strength and Fire Resistance.

Concrete floors between steel beams at 5ft. to 7ft. centres developed excellent and satisfactory fire-resistance. They invariably sustained safes and heavy objects during the earthquake and the fire and remained in position even in cases of the most abnormal distortion of the steelwork.

Hollow tile, on account of its brittleness and lesser fire-resistance, is not well adapted for fire-proof floor construction. Wherever this material was exposed to the flames in moderate and normal fires, such as occurred in typical office buildings it was more or less injured, the soffit surfaces falling away and exposing the cellular spaces. On account of its brittleness, safes frequently broke through it and fell from an upper storey, crashing through successive floors to the basement, sometimes inflicting vast damage to the mechanical equipments.

V.—Adopt Reinforced Concrete for Partitions.

None of the usual methods of partition construction fulfilled the requirements. Hollow tile blocks invariably failed in the fire, and by falling into stairway wells and elevator shafts proved to be exceedingly destructive to the stairways and the mechanical equipments in the basements. Reinforced concrete is admirably adapted for a partition construction, and in all the instances where it was used it gave entirely satisfactory results. Metal-lath and plaster partitions, though liable to be distorted, can be depended upon to remain standing and serve as a barrier to prevent draughts and the spread of the flames.

VI.—Never permit Pipes inside the Column Protection.

The bulging of pipes from expansion due to heating damaged and disrupted the column protection in numerous instances before it would have failed otherwise. The location of piping in close proximity to columns is objectionable and exceedingly bad practice. Gases, moisture, &c., from such pipes are very injurious to the columns and facilitate oxidation. A separate enclosure independent of the column protection should, in all cases, be provided for vertical pipes.

VII.—Provide Metal Treads for the Stairways.

Marble and slate treads in stairways should be supported by metal underneath. In many cases where the treads of the stairways were simply outlined framing supporting marble and slate slabs the latter were destroyed or broken by the fire and the stairways rendered unserviceable and dangerous. If metal treads are provided underneath the wearing surface the stairways will remain serviceable during and after a fire, even in case the stone and slate slabs are damaged or destroyed.

VIII.—Provide for the Expansion of Steel Lintels and Mullions.

In numerous cases the expansion of steel lintels bulged the walls over the window heads, requiring extensive repairs. The vertical steel members called mullions frequently deflected and buckled when heated, disrupting the masonry facing and causing it to fall away. When this occurred round interior light courts with a large skylight below, the *débris* from the mullions invariably broke the glass and damaged the frame of the skylight. By providing suitable spaces at the ends of lintels and expansion joints for the mullion members this difficulty would be avoided.

IX.—The Filling between the Fireproof Floor Arches and the underside of the finished floor should never be omitted.

In several instances where this space was not filled, the upper portion of the floor beams being left exposed, the burning of the wood floors and other combustible contents generated sufficient heat to warp and deflect the beams so as to require renewal, straightening or re-rolling. The filling of this space by a light incombustible material, such as cinder concrete, adds to the sound-proof qualities of the floors, and serves as a fire-resisting protection to the upper portions of the floor beams and girders.

X.—Avoid Light Supports and Copper Wire in Metal Lath and Plaster Construction.

Many phases of the flat metal-lath and plaster ceilings were caused by too light or poorly designed clips which supported the furring from the floor beams. Failures also occurred on account of the low fusing point of copper wire which was sometimes employed to attach the metal lath to the furring.

Supporting clips for furring should be made from not less than 1in. by ⅛in. steel stock, and should hook around both sides of the lower flange of the beams.

A mild steel galvanized lacing wire of not less than No. 18 B & S gauge should be used to attach the metal-laths to the furring.

XI. The small Steel Vaults and Portable Fire Safes, even of standard makes, proved most ineffective in preserving their contents.

A vault of suitable design, and built of reinforced concrete or brick, offers better security.

RECENT FIRE TESTS.

Roller Shutters to Windows.

We publish on the next page an article by Captain Sewell on the importance of the protection of window openings, and we observe that the British Fire Prevention Committee has recently issued a report, No. 113, dealing with this question from a somewhat novel aspect. A comparative test has been undertaken and reported upon as between a wire-glass casement protected by a steel rolling shutter and a hardwood casement with wired glazing. This may be considered more in the way of an experimental test than as one intended to prove the efficiency of the roller shutter, with which we have dealt before, and which made such a successful showing. There is no doubt that these roller shutters will keep fire at bay, but there is still the question of radiation to be considered, and in the same way as the directing member in charge of the test with Mississippi wire glazing pointed to the hazards of radiation, so does the directing member of this comparative test call attention to the question of radiation through steel shutters. Efforts will have to be made, and no doubt are being made, not only to make steel roller shutters fire stops, but to make them radiation proof, if we may use this expression, and we have no doubt that, seeing the success in the one direction, success in the other may also shortly be obtained.

Turning back to an early report of the Committee, dated 1899, we find that three examples in which ¼-in. plate glass, 32-oz. sheet glass, and ordinary lead lights were used were put under test for comparative purposes. The 32-oz. glass had fallen and broken after six minutes, and the lead glazing had collapsed after seven minutes, whilst after twelve minutes the ¼-in. plate casement had been burned through.

Now, in this test ordinary 32-oz. glazing was protected by a Kinnear roller shutter placed about 6ins. away, and the result was that instead of the glass letting the fire through in six minutes, the glazing was protected for 47 minutes, at which time the deal sash burst into flame, and the glass dropped out.

The benefit of the shutter even at the closest possible quarters was therefore a gain of 40 minutes. In the test referred to, No. 33 of 1899, the casement was in a teak frame, whereas in this case the casement protected by the shutter was in

OUTSIDE VIEW OF SASHES (PREVIOUS TO TEST).

deal, which makes a considerable difference. We feel that if the roller shutters were treated in some way as regards radiation they would be even more effective at such close quarters as 6ins., and that a development in this particular direction would be most valuable. In the particular case under test the teak sash already showed a glow on the outside in 53 minutes, and in 60 minutes flame had burst through.

Apart from the matter of fire resistance, there is also the æsthetic question to consider: that where a roller shutter is employed the glazing can be ordinary glazing, whilst where wired glazing is utilised the mesh does not add very much to beauty—in fact, quite the reverse.

The test in question cannot perhaps be looked upon quite as a positive test, for it did not go far enough, and a series should be undertaken to arrive at definite results; but nevertheless an instructive lesson is to be learnt from the efforts of the British Fire Prevention Committee in this connection—namely, that although ordinary glazing in suitable frames if protected by Kinnear shutters is excellent under specific conditions, it is yet possible to materially improve its efficiency, on the one hand by doubling the glazing, or applying wire-glass, or on the other by making the shutters less susceptible to radiation.

The advantage of the Kinnear shutter is, however, that even if radiation does ignite anything on the further side, it does not let a body of flame pass through the opening, as in the case of a wire-glazed casement through which fire has passed, and that those trying to confine the spread of fire on its further side thus have much easier work.

OUTSIDE VIEW OF SASHES (AFTER TEST).

Impending Fire Tests.

We understand that the British Fire Prevention Committee will be continuing its series of fire tests with floors during December, and that one of the floors under test will be what is known as an "Armocrete" floor, comprising composite reinforced concrete girders and concrete tubes, in place of the dense terra-cotta tubes that were generally used formerly, and which were found so ineffective as a fire-resistant. It is also anticipated that a further series of reinforced concrete floor tests will be undertaken in the course of the spring.

Forthcoming Reports.

As to reports about to be issued, the next in rotation will be one on the two Houghton doors, and another in respect to the series of tests with the "Kylfyre" powder extinguisher. Extinguishers are not subject to classification, being appliances for which there are no specific standards as yet. Of other publications shortly anticipated, there will be a report of the Committee's Special Commission's visit to Milan, which will embrace both constructional and fire service matters.

THE PROTECTION OF WALL OPENINGS.

By Captain John Stephen Sewell.*

Before the Baltimore conflagration it was not at all uncommon to hear the claim put forth that the contents of the modern so-called fireproof buildings were quite secure from fire originating outside of the buildings themselves, and that, in the event of an interior fire, only the contents of the compartment where the fire originated would suffer. Apparently insurance men considered that a considerable number of fireproof buildings in a given district would make that district conflagration-proof by virtue of the resistance they would offer to the spread of the fire.

Baltimore and San Francisco have demonstrated quite conclusively that, so far as conflagrations are concerned, these opinions were over-sanguine, to say the least. Where interior fires have gutted fireproof buildings, there have, so far, been well-holes or other openings so entirely unprotected that the building was practically not subdivided at all, so that nothing was proved. There have been a number of cases in office and hotel buildings where the contents of a room have burned out and the fire has been confined to the place of origin. In all such cases, however, the amount of combustible matter has been small, and it was quickly consumed, so that the test was not severe. The right kind of fire has not yet occurred in the right kind of building. When it does the interior wall openings will prove as weak against a really severe fire originating within as all openings have proved in the midst of a severe conflagration. Sooner or later some crowded storage warehouse, or some building used partly for offices and partly for sales warerooms, will provide the necessary demonstration.

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* Captain, Corps of Engineers, United States Army.

It is probable that if architects and architectural engineers had been as well acquainted with fires as they are with æsthetic and structural matters a more nearly fireproof type of building would have been evolved before now. The most striking demonstration of inadequacy in early steel or iron frame buildings was the tangled mass of structural shapes remaining after a fire, and its inevitable collapse. To prevent this a more or less adequate protective covering was applied to the structural metal. Under pressure from the underwriters a few exterior and interior openings were protected with metal or metal-clad doors and shutters. For æsthetic, sanitary and economic reasons, portions of the floors were finished in incombustible materials. Here the change stopped; even underwriters did not urge shutters on principal fronts, and if they had, owners would have laughed at them, for it must be confessed that the tin-clad shutter is a clumsy and hideous object—except when the emergency arises, and it bears the brunt of the battle. No doubt to the owner of the goods behind it—and to the underwriter whose money is staked on their safety—the humble-*looking* device becomes an object of admiration and gratitude, as it demonstrates its reason for being.

Buildings compared to Stoves.

The structural parts of a building are not the only ones that have been made of combustible materials, however. Window and door frames, doors and sashes, base-boards, architraves, floor finishings, timber studs in otherwise incombustible partitions, transom frames, &c.—all these, as well as the contents, were combustible in the older buildings, and the change to incombustible types has hardly affected them even yet. When one builds a stove he leaves an opening through which to light the fire; the analogy in the case of the modern fire-resisting building is plain and has often been pointed out before. But the stove has no openings save those necessary to introduce the fuel and light it, and those required for the admission of air and the disposal of the products of combustion. The draught is so arranged that the fire naturally seeks an outlet only through the openings specially devised to give it harmless exit. Close the draughts, however, and pour a quantity of kerosene on the fire, or build a bigger fire of any highly inflammable materials than the chimney can handle, and the fire will not stay in the stove.

In the case of the fireproof building full of combustible contents the analogy is with the stove in the latter condition, except that the openings for lighting the fire are greatly increased in number and area. The conclusion is that a modern protected steel frame building, with the right kind of occupancy and openings of the ordinary type, may prove to be both a conflagration breeder and a conflagration feeder; it will only rarely be a conflagration breeder, perhaps, but such a rôle is by no means impossible or improbable. It has already been a conflagration feeder, only too often; that it has not demonstrated its capacity in the other direction may be due to good luck rather than to its own inherent excellence. Another reason is that it is not so likely to be subject to specially hazardous occupancy as a building of the older type.

All Wall Openings must be Protected.

It would seem that the time has come to insist upon protection for all wall openings in congested value districts, if not in all closely built districts. In both Baltimore and San Francisco the fire crossed the principal streets as well as the alleys and more subordinate streets. It is claimed that in San Francisco the radiant heat ignited buildings at a distance of over one hundred feet. Mr. S. A. Reed told the writer once of a board fence which he saw ignited, or at least charred, by the radiant heat from a fire even more distant. When the centre of combustion becomes a large area or volume of incandescent gases the law of inverse squares seems no longer to govern the intensity of the radiant heat, and moderate distances are no protection. The conclusion seems inevitable that a wide street is not, in itself, an adequate conflagration barrier. If this is true, either all openings must be protected or conflagrations must be expected, at longer intervals no doubt, but no less regularly than ordinary destructive fires.

The protection of openings, therefore, may be fairly classed as the most important problem now demanding solution in connection with the reduction of the annual fire loss. There is much reason to criticise the type and character of the so-called "fire-proofing" currently used in commercial buildings, no matter what materials may be used, whether terra-cotta, concrete or plaster of Paris. But the poorest of them is sufficient, if the fire does not enter the building—even timber construction would do, if ignition could be prevented. To this one end should be devoted most of the energy now available. When it shall have been accomplished it will be time to improve floor construction, column coverings and other details which have not stood the ordeal as they should.

It is not sufficient, however, to cry aloud that something should be done. Solutions should be suggested, or at least possible lines of development should be pointed out, as often as possible. No doubt ninety-nine out of a hundred will be of no value; but the ninety-nine may be the forerunners of the hundredth, which may prove successful. The writer therefore ventures a few suggestions, with the reservation that he does not claim to have solved the problem, and is not sure that a single one of his suggestions may prove to be the right one, or even of great value.

It is no mean problem, this question of protecting the openings. The current fairly successful methods of admitting light and air and providing communications, while excluding the weather, are the result of careful thought of generations, but even now improvements are possible and much to be desired. To accomplish these ends and also resist the attack of fire without serious sacrifice of appearances, comfort, convenience and adaptability to proper uses is, as before stated, practically an unsolved problem.

An Analysis of Fire Resistance.

It may be useful to analyse the problem into its elements. Resistance to aggression of any sort may be of two kinds—passive and active. Where resistance is entirely passive, it is only a question of time and energy to overcome it. When it is entirely active, it may or may not be successful. Where the two methods are combined, the prospect of success is greatly improved.

A very good example of passive resistance to fire is a solid brick wall; if really solid and thick enough it will resist any ordinary fire, even though the fire be right up against it. Yet if the fire be hot enough and last long enough the wall must ultimately yield and may by elevation of its own temperature ignite combustible objects behind it, even before it yields structurally.

A sprinkler system is a sort of active defence, and any and all methods of fighting fire by human effort are in the same class.

If wall openings could be so finished and protected that they would offer as much passive resistance as the wall itself, the problem would be solved to all intents and purposes. It may be taken for granted, however, that this is impracticable, if not impossible. If such an active defence could be organised at every opening as to extinguish all incipient fires due to radiant heat and prevent the actual entrance of flame, this also would be sufficient, as was very clearly illustrated in the buildings at San Francisco, where such efforts, aided by a certain amount of passive resistance, were successful. The works of the Western Electric Company and the three Federal buildings, which were saved, are the cases referred to. It is probable that the ultimate successful solution will be found to lie in a passive resistance of considerable value, supplemented by active resistance at the points of fiercest attack.

A building with masonry walls and protected openings in a conflagration may be likened to a fortification which is in a state of siege. The character of the structure itself makes entry by the attack a more or less slow and awkward process; yet, as the fort requires a garrison to hold it, so must the building be manned, and all its openings watched, otherwise it must suffer the same fate as the Bush Street Telephone Exchange in San Francisco.

Reduce the number of Wall Openings.

The first step in the creation of a strong, passive resistance is the reduction of openings, in both number and size, to the minimum consistent with their ordinary uses; they should also be as deep as possible. A fort must have entrances, but they do not occupy a whole front, and they are so devised that each shall constitute an easily defended defile. A small window is more easily protected than a large one; and it seems reasonable to suppose that the thick walls of the Federal buildings in San Francisco made the successful defence of unprotected openings much easier than it would have been had the walls been thinner.

The second step is unquestionably the elimination of all combustible material of every description from the trim and finish of every opening; to leave food for the fire at this point is to supply the attack with ammunition from the magazines of the defence.

The next step is to provide real resistance to the attack, at all stages; just as a fort is planned to resist both long-range fire and storming parties, so the protection of the opening must stop both radiant heat and the flame itself. It seems probable that the passive means alone may suffice against the radiant heat; but it is manifest that the close attack must be met by active and well-directed effort on the part of the garrison, supplemented, perhaps, by properly-designed automatic devices. Providing for the active defence is the last and decisive step in the organisation of a victory.

The reduction in the number and size of openings is a question calling for much consideration and good judgment. Light and air are essential; yet it would seem that smaller openings, properly disposed, might be made just as efficient as the vast array of glass so often seen.

Eliminate Wood in Window Finish.

There is no longer any excuse for finishing the openings with combustible materials; metal frames and sashes, metal trim and metal-covered doors are now but little more expensive than those made of wood, and the increased cost in these items could readily be made up by the omission of marble dadoes, columns and pilasters, together with moulded and decorated plasterwork in the interior, where they are often but examples of a too florid taste in design and almost never of real utility.

To prevent the entrance of radiant heat, an opaque screen must be provided. Wire-glass is not sufficient. As radiant heat is the form of first attack, the screen should occupy the outermost line of defence. Just how it shall be provided is a problem demanding solution. In the Bush Street Exchange, San Francisco, some of the openings were closed on the outside with rolling shutters made up of interlocking corrugated slats. Such a shutter will stop radiant heat for a time; if it becomes too severe, there is a danger of the slats warping away from each other, and the actual impact of flame would almost certainly produce this result. The writer is inclined to think that the best solution may prove to be a continuous flat sheet of steel (not necessarily very heavy), or a shutter composed of several such sheets, sliding or telescoping out of sight into a box-head above the window opening proper. The details of design, whereby the sheets may be prevented from warping away from each other and pulling out of the rebates in the jambs of the opening, when subject to high temperatures, are difficult, but probably not impossible. Ease and certainty of operation, facility of repairs, protection from corrosion, &c., are all serious factors of this same problem.

The Use of Triple Sashes.

Behind the outer screen, the sash should unquestionably be glazed with wire-glass. The Colorado building in Washington, D. C., has, in certain of its exposed windows, three sashes, any two of which will close the opening; two are of wire-glass and the third is of clear glass. The result is very satisfactory, so far as light is concerned, and it enables the opening to be closed entirely with wire-glass, when occasion demands. Polished wire-glass would do away with the necessity for the clear glass, but probably at greater cost.

The necessity for the wire-glass arises from the fact that, sooner or later, any outside shutter must yield. At San Francisco the attack was sufficiently prolonged, in many cases, to have accomplished such results. Probably a window sprinkler, properly disposed, either outside of the shutter, or between it and the sash, so designed as to keep the shutter wet, would prolong its useful life. But in a conflagration, the maintenance of the water supply for myriads of sprinklers would be a problem in itself.

If it be assumed that the other opaque shutter must yield, then in important cases, at least, it follows that there should be on the inside another opaque and incombustible screen, to stop the radiant heat after the glass is exposed. This could be very light, for it is not probable that both the outer shutter and the wire-glass would totally yield, unless conditions were much worse than any that have as yet arisen. But it seems that really adequate protection for window openings will ultimately require the triple line of defence, unless some inventive genius shall devise an outer shutter able to resist any attack, which is at the same time inoffensive in appearance and easy in operation.

For exterior door openings, an outer screen or shutter and a metal-covered door of the best type would probably be equivalent to the triple window defence. For interior doors, a single metal-covered door would suffice, in most cases; at strategic points two such doors should be provided for every opening. Interior sashes and transoms would probably be adequate, if made of incombustible materials, and glazed with wire-glass.

So much for passive defence. All these devices, except the sprinklers, are entirely inert, and correspond to the various obstacles contrived, in the defence of fortified places, to impede the attack and delay the enemy at points where the defenders will have him at a disadvantage. The sprinklers are analogous to the mines often planted in the ground over which the attack must advance.

Value of an Active Defence.

The really active defence requires the immediate expenditure of human energy. Every building has a small staff, generally under the orders of the chief engineer. Upon the occurrence of a near-by dangerous fire, this force should securely close all exposed openings. Desks and other combustible articles should be moved from the vicinity of windows and doors. Fire hose should be manned, and pressure put upon the standpipes. Every exposed opening should be watched, and, if necessary, kept wet. If conditions are such that a private water supply can be developed for the building, it should have been included in the original design and construction. It is unnecessary to discuss the necessity for reliable fire pumps and other means of maintaining the water supply; underwriters have pointed out the proper solution of this problem, as well as distributing the water to the points where it may be required. All these things amount to providing the defence with proper weapons and suitable ammunition. Even without them, however, much may be done by a few active and energetic men, if openings are adequately protected—without such protection a whole army of fire-fighters would be flanked out by a conflagration such as those in Baltimore and San Francisco, and compelled to retire. Even in this case, however, the disaster may be lessened if the combustible contents can be removed before the fire takes possession. The building will suffer less damage, and, what is more important, it will probably not pass the fire on to its neighbours.

It is possible, and even probable, that many buildings, with the passive protection above suggested, might take care of themselves in a conflagration, without any active defence; even if gutted themselves, they would almost inevitably act as efficient barriers. But the active defence should in no case be neglected, and the police and fire departments, as well as the military authorities, would better permit a little looting than prevent owners from fighting the fire in their own buildings. Efforts of the kind described herein, if intelligently directed, would do more to stop conflagrations than any possible use of dynamite or other explosives.

The Cost not Prohibitive.

It may be objected that the writer's suggestions as to protection of openings would lead to prohibitive expense; but, if useless ornamentation be sacrificed, this will not be true. It is not claimed, either, that buildings can ever be made absolutely proof against damage. But their contents may be preserved and they themselves maintained in habitable condition—this would make all the difference in the world. After the fire there would inevitably be damage to be repaired on the exposed fronts and most of the protective devices would have to be renewed; but all this is a relatively small matter, if only successful resistance be assured. The rôle of the fire shutter is always that of a forlorn hope; if it results in victory, its own destruction is of minor consequence. Unlike the loss of men in similar circumstances, this one is easily repaired, and no underwriter will begrudge the cost of renewing any protective device which is destroyed in stopping a fire.

It is not only in a conflagration that adequate protection for openings proves a good investment; ordinary severe exposure fires equally demand it. Had it been used in such buildings as the Horne Stores in Pittsburg, and the Home Life building in New York, and others that might be named, much wealth that went up in smoke would have been saved, and the entire country would have been that much better off.

Conditions demand, and building ordinances should require, that every building should neither be an easy prey for the flames itself, nor the means of passing them on to its neighbours. No tentative and half-way methods should be tolerated; the result should be no more in doubt than the ability of the structure to carry, with safety, its ordinary working loads.

A " fireproof " building which permits a conflagration to destroy its contents, and which suffers itself a loss of 60 per cent. and more, is not a success from any point of view, no matter how proudly its structural skeleton may stand above the ashes of its combustible neighbours. The essence of the whole problem is the protection of the openings.

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St. Paul's in Danger THE question of the safety of St. Paul's Cathedral has again come into public notice owing to the imminent construction of a new sewer by the London County Council, which it is proposed shall pass close to the south side of the building. The Cathedral authorities did not regard the construction of this sewer as dangerous when it was first proposed by the Council, but new factors have recently arisen which cause the matter to appear in a different light. In constructing the sewer it is not proposed to sink any shafts near the Cathedral, it being intended to drive the sewer in the same way as tube railways are constructed, from shafts sunk on the one side of the Cathedral at Ludgate Circus and on the other at the junction of Queen Street and Cannon Street. The line of the proposed sewer is from 35 to 40ft. away from the nearest point of the Cathedral; it will be 50ft. below the roadway, and about 40ft. below the Cathedral foundations. Therefore, there would be a distance of over 50ft. diagonally between the sewer and the bottom of the foundations. It is stated that the sewer would be 16ft. below the top of the London clay, through which it is to be driven. As our readers are aware, Mr. Somers Clarke recently resigned his post as architect to St. Paul's and Mr. Mervyn E. Macartney has succeeded him. It appears that Mr. Macartney and the clerk of works, Mr. Harding, have been carefully examining the structure, and they have made the alarming discovery that although the south-west tower of the Cathedral has been for some time 13ins. out of the perpendicular, movement has not ceased and the cracks between parts of the structure are widening. It is stated that flooding on the District Railway between Blackfriars and the Mansion House Stations has increased to such an extent that water has to be pumped out almost constantly, and this is considered the immediate cause of the latest settlement. It is believed that there is a gradual subsidence taking place on the whole of the south side of Ludgate Hill and St. Paul's Churchyard. The seriousness of the danger to St. Paul's Cathedral is easily understandable when we remember that the foundations are only 10ft. below the level of the roadway, or about 6ft. below the level of the crypt, and, as borings have shown, rest upon a layer of loamy soil or potter's earth, under which is a stratum of gravel containing from 3ft. to 5ft. of water, which is upheld by, but does not penetrate into, the London clay under the gravel. If the water in the gravel is drained away, naturally the foundations will sink and the only remedy seems to be to underpin the foundations down to an immovable stratum—namely, the London clay, which is 24ft. below the foundations. It has been suggested that the Cathedral might be supported upon a raft of concrete, but if the ground sank at one point this bed of concrete would crack under the heavy load it would be called upon to sustain. The cost of underpinning would be at least £100,000, but it seems the only safeguard for the future. The construction of the sewer has not yet been commenced within two miles of any part of the Cathedral and no shafts have been sunk, so that there is opportunity to modify the plans. The London County Council has come forward with a statement by its engineer, Mr. Maurice Fitzmaurice, which Dean Gregory of St. Paul's thinks is done with the desire of obscuring the issue and precipitating the action with regard to the sewer desired to be constructed. He states that Mr. Macartney thinks the construction of the sewer will be an actual and imminent danger to the Cathedral. In the present circumstances it may, although if the Cathedral foundations were carried down to the clay with the precautions proposed in 1904 by Messrs. Barry, Leslie and Co., the engineers to the Chapter, who were asked to report upon the sewer when first proposed, no danger should result. It is not as if the sewer were as large as a tube railway, for it is only 7ft. 6ins. internal diameter and 9ft. 4ins. external diameter, nor is there any vibration as arises with a railway. Mr. Fitzmaurice has referred, in an interview, to the fact that the Rotherhithe tunnel was cut at a depth of 10ft. below the Thames, yet not a drop of water came through. In the present case there will be 16ft. of solid London clay above the sewer. Mr. Fitzmaurice states that the various suggestions made in 1904 by Messrs. Barry, Leslie and Co. have been all embodied in his specification. These were chiefly as follows:—No void was to be left between the outer skin of the sewer and the London clay displaced to make room for it. The "shield" process was to be adopted and the work carried out under air pressure if necessary, and the excavation in front of the cast-iron rings was not to exceed the minimum amount necessary to insert each cast-iron ring in place. Messrs. Barry, Leslie and Co. further approved the proposal that the cast-iron rings should be 1½in. thick, and they expressed the opinion that with concrete and brickwork inside the tube and cement grouting outside no corrosion need be anticipated. There is already a local sewer in between the proposed sewer and the Cathedral in the gravel 20ft. to 25ft. below the surface, which ought to be done away with. St. Paul's must at no distant date be underpinned and the works should be commenced at once. As soon as the building is shored up, the London County Council's sewer could be allowed to proceed without fear of harm.

NEW BUILDINGS IN GLASGOW.

If we could imagine Glasgow in some sunny clime, with its buildings of clean white stone and the atmosphere free from acid gases and sooty particles, the general impression it would give us would be very striking, because the commercial architecture of "the second city of the Empire" has many claims for attention, though the effect of it is largely diminished by dull skies and a devastating blackening that soon spreads over all buildings. The preservation of stonework in Glasgow has, indeed, become a serious matter.

In our issue for October 3rd, when dealing with new buildings in Liverpool, we pointed out in our prefatory remarks how, by reason of the number of buildings to be considered, we were obliged to confine the meaning of "new" to the last four or five years. The same limit is necessary with Glasgow. In this review, therefore, we have not gone farther back than the Exhibition of 1901. In the years that have since elapsed many important new buildings have been erected, and others equally important are now in course of construction. We think it perhaps best to deal with these in classes rather than chronologically or in divisions of the city.

The insurance companies and the banks of this country, with their huge capital, are very generous in the matter of housing themselves, and in most cities of the Kingdom insurance and bank premises are among the most important commercial buildings. This is the case in Glasgow. Having imposed a limit of five years on our present review, such notable buildings as Mr. J. J. Burnet's savings bank in Ingram Street and Mr. Leiper's "Sun" fire office building in Renfield Street are quite outside consideration, having been completed in the nineties. We find, however, a notable new building of this class in St. Vincent Street, where the

Edinburgh Life Assurance Co.'s Building

has been erected. The architect was Mr. John A. Campbell, of Glasgow. The site lies between two streets, the front being in St. Vincent Street and the back in West George Lane. The front is interesting as a clever piece of modern Italian Renaissance with a good deal of fresh feeling introduced into it, and the rear elevation is also interesting as showing the difficulties which have to be met in lighting suites of offices on narrow streets. The illustration on the next page shows what an enormous amount of window space has been provided at the rear, and also how, by the use of patent casements, the obstruction of light by mullions and transoms has been reduced to a minimum. The building was erected with a steel frame, the columns being encased in brickwork and the girders in concrete. The detailing throughout is very refined, as, for instance, in the cartouches on either side of the main entrance, and in the ironwork to the liftwell. The entrance hall is lined with marble and has a very rich effect, and throughout the building the work is well executed. A restaurant is provided for on the ground and basement floors, the ventilation and warming being on the

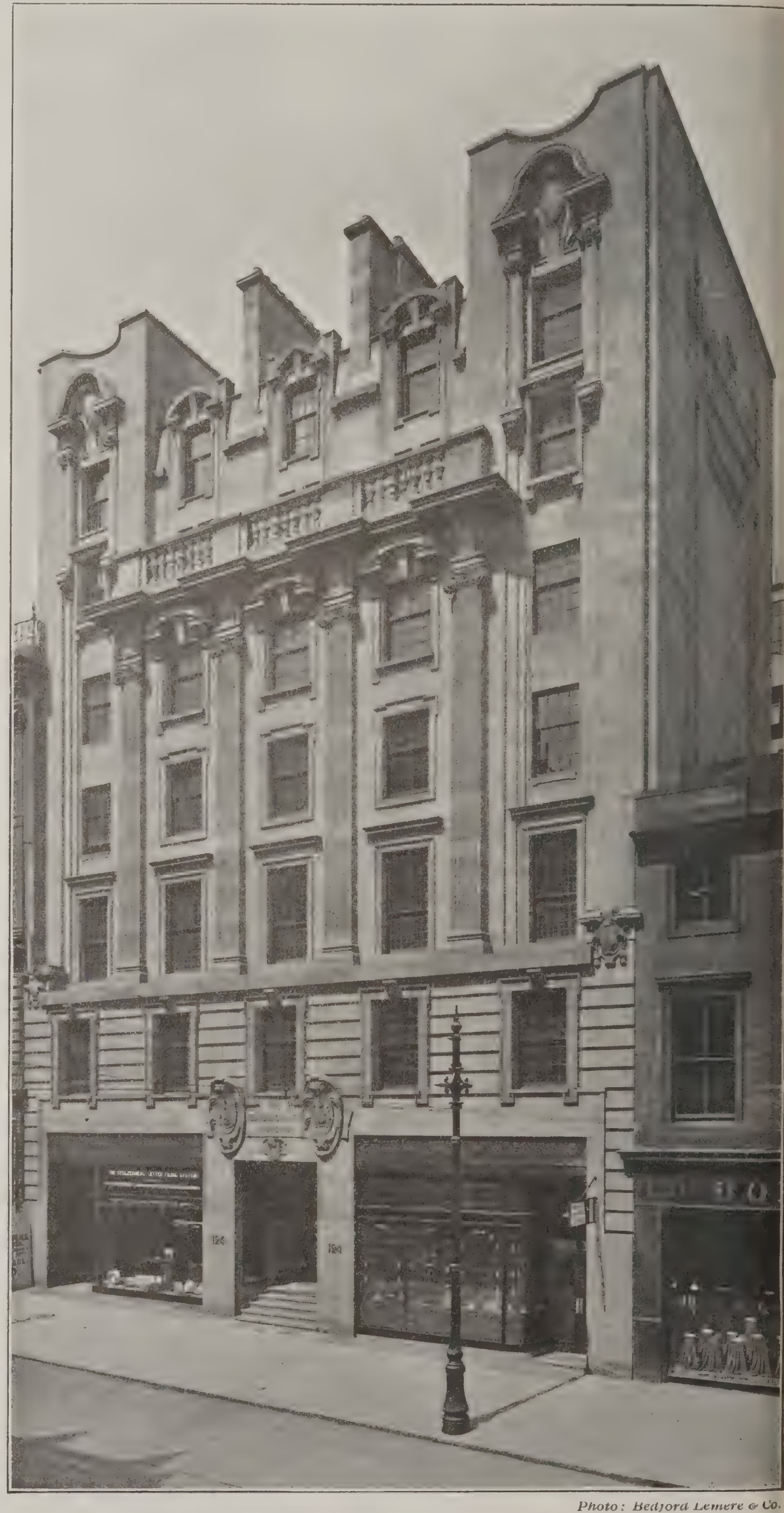


Photo: Bedford Lemere & Co.

EDINBURGH LIFE ASSURANCE BUILDING, ST. VINCENT STREET.
JOHN A. CAMPBELL, I.A., F.R.I.B.A., ARCHITECT.

"Key" plenum system. The air, after being filtered, washed and humidified, is warmed in winter and cooled in summer, and delivered in such volume as to renew the air 15 times per hour—a complete change every four minutes.

The contractors were as follows (of Glasgow, except where otherwise stated) :—

Mason work, Morrison & Mason, Ltd.; *joinery*, Mathew Henderson; *steelwork*, Redpath, Brown & Co., Ltd., Edinburgh; *plumbing*, James Goodlet, *plastering*, George Rome & Co.; *glazing*, C. & S. Malloch; *painting*, George W. Sellars; *tile and marble work*, Galbraith & Winton; *fireproof floors*, S. Ferguson & Co., Carlisle; *electric lighting*, J. B. Meiklejohn; *electric passenger lifts*, Otis Elevator Co., London; *heating and ventilation*, William Key; *grates*, W. McGeoch & Co., Ltd.; *wrought-iron gates at entrance*, Hardman, Powell & Co., Ltd., Birmingham; *lift enclosure*, Donald Clerk & Son; *stone carving*, H. H. Martyn & Co., Cheltenham; *name plates*, Bromsgrove Guild of Handicraft, Bromsgrove; *steel casements*, Henry Hope & Son, Birmingham; *enamelled and fireclay bricks*, Shawrigg Fireclay Co.; *terra-cotta bricks*, New Cleghorn Terra-Cotta Co.; *common bricks*, Summerlee Brick Co.

Scottish Provident Institution Building.

This building occupies a site in St. Vincent Street close to George Square, the frontage to St. Vincent Street being 133ft., and 80ft. to North Court. At the present moment only one wing is complete. A view of this, in comparison with the whole design, is given on the next page. The building is seven storeys in height. The centre portion of the street floor will be occupied by the Institution's office, and the rest of the building is intended for public offices. The first three storeys are rusticated and surmounted by a balcony. The two ends of the façade are finished in advance of the centre portion, and above the balcony they are treated with columns which run up through three storeys. Above this level is the main entablature, and surmounting same is an attic storey and balustrade. The building is designed in late French Renaissance style, the architect being Mr. J. M. Dick-Peddie, of Edinburgh.

The following is the list of contractors (of Glasgow, except where otherwise stated) :—

Mason work, J. Paterson & Son, Ltd.; *joiner work*, John Cochrane, junr.; *plumbing*, James Symington; *plastering*, George Rome & Co.; *slating*, John McOuat & Sons; *concrete floors*, Stuart's Granolithic Stone Co., Edinburgh; *ironwork*, P. & W. McLellan; *glazing*, C. & J. Malloch; *heating*, Mackenzie & Moncur, Edinburgh; *passenger elevator*, Otis Elevator Co.; *tile and marble work*, Galbraith & Winton. *Inspector of works*, Mr. John Currie.

National Bank of Scotland, St. Vincent Street.

At the corner of St. Vincent Street and Buchanan Street is a large building of the National Bank of Scotland, having a frontage to the former of 102ft. and to the latter of 104ft., the main entrance to the bank being in St. Vincent Street. The bank telling-room occupies on the street floor the space which is used as a light well for the offices on the floors above. This room is surrounded with coupled marble columns supporting a deeply coffered ceiling with a dome in the centre. The rest of the street floor is occupied by shops, entered from Buchanan Street. The building is designed in Italian Renaissance style, the first two storeys being rusticated and surmounted by a balustrade. The corners are treated as gables, with coupled columns running through two floors. The main entablature rests on these columns, and above an attic storey and balustrade run round the building. The entrance to the bank is very imposing, having the Royal arms of Scotland set beneath a large pediment flanked by coupled columns (see page 264). Mr. J. M. Dick-Peddie was the architect.

The following were the contractors for the building (of Glasgow, except where otherwise stated) :—

Mason work, P. & W. Anderson; *joiner work*, James Morrison; *plumbing*, James Symington; *plastering*, John McKenzie; *painting*, J. Bennet & Son; *slating*, Hamilton & Co.; *marble work*, Galbraith & Winton; *scagliola work*, Bellman, Ivey & Carter, London; *two electric elevators*, Otis Elevator Co., London; *electric lighting*, Claud Hamilton & Co.; *heating*, Mackenzie & Moncur, Edinburgh. *Inspector of works*, Mr. John Currie.

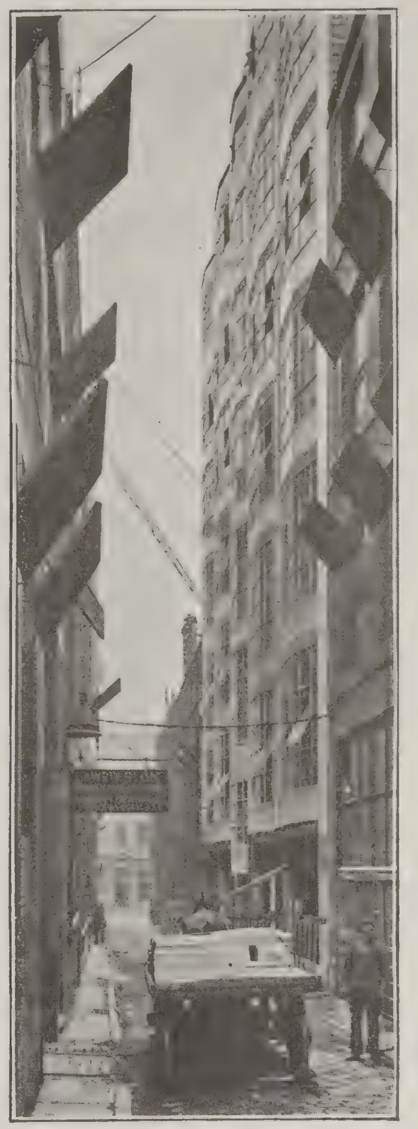
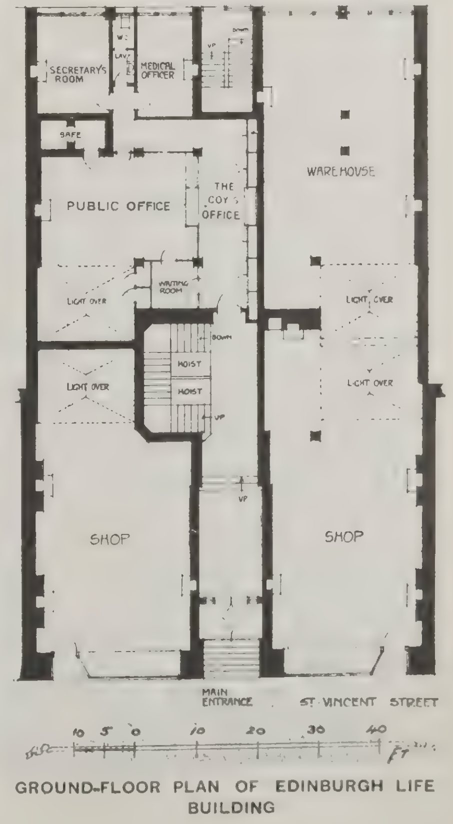


Photo: Lewis.

BACK ELEVATION OF EDINBURGH LIFE BUILDING, SHOWING STEEL CASEMENTS.

Photo: Bedford Lemere & Co.

MAIN ENTRANCE.



GROUND-FLOOR PLAN OF EDINBURGH LIFE BUILDING

Savings Bank at Anderston.

This building was completed in 1902. We cannot say that we like it unreservedly, because it has several features which strike us as being carried to excess, but there are many new *motifs* in it which are the outcome of considerable thought and ability: the entrance, for example, where the carving is by Mr. Albert Hodge. Considering work of this kind, one must always remember that it is a great deal easier to be conventional than to be fresh. For our own part, however, we vastly prefer a building which shows some attempt at individual treatment—even though it may be strange—than one of those "safe classic" designs which are the stock-in-trade of several well-known architects. Let some of the "correct" detailing on buildings of the latter class, "eminently respectable," be compared with the detailing on a building like this bank at Anderston. It will be evident how much superior the latter is.

The building is of red sandstone finely tooled, and is roofed with slates. The bank occupies the greater part of the ground floor, with strong-room, heating chamber and lavatories in the basement. A shop and saloon are also provided on the ground floor, while on the upper floor are nine apartment houses. The cost of the building was about £12,000.

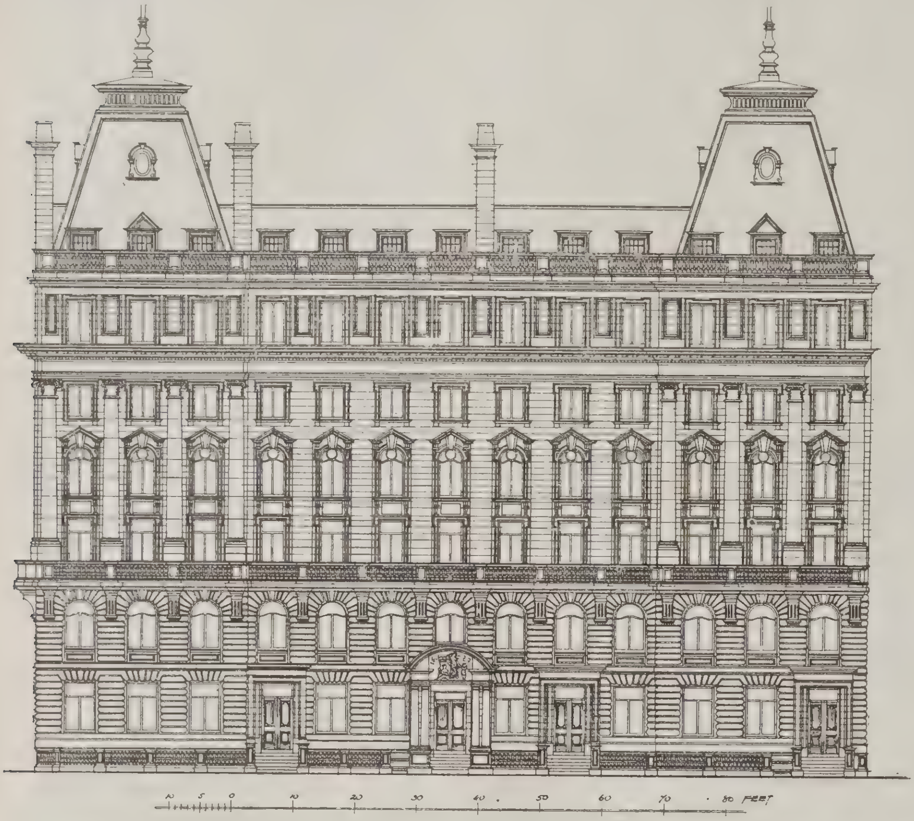
The following is the list of contractors (of Glasgow, except where otherwise stated):—

Mason work, &c., John Kirkwood; *joinery*, James Morrison & Sons; *plumbing*, Wm. Anderson; *plastering*, George Rome & Co.; *slating*, J. McOuat & Son; *painting*, George W. Sellars; *tile and marble work*, Galbraith & Winton; *electric lighting of bank*, McAulay Clark & McLaren; *electric lighting of houses and shops*, Johnston Park & Co.; *electric fittings*, Holland House E. M. Co., Ltd.; *heating*, James Combe & Son; *hydraulic hoists in bank for books, &c.*, A. & P. Steven; *revolving door at bank entrance*, Van Kannel Revolving Door Co., Ltd., London; *blinds*, John Bryden & Sons; *mosaic work in bank entrance*, British and Italian Mosaic Co., Ltd.; *wrought ironwork*, Geo. Adam & Son; *safe doors*, Wm. Paterson & Son. *Clerk of works*, Mr. Alex. McLay.

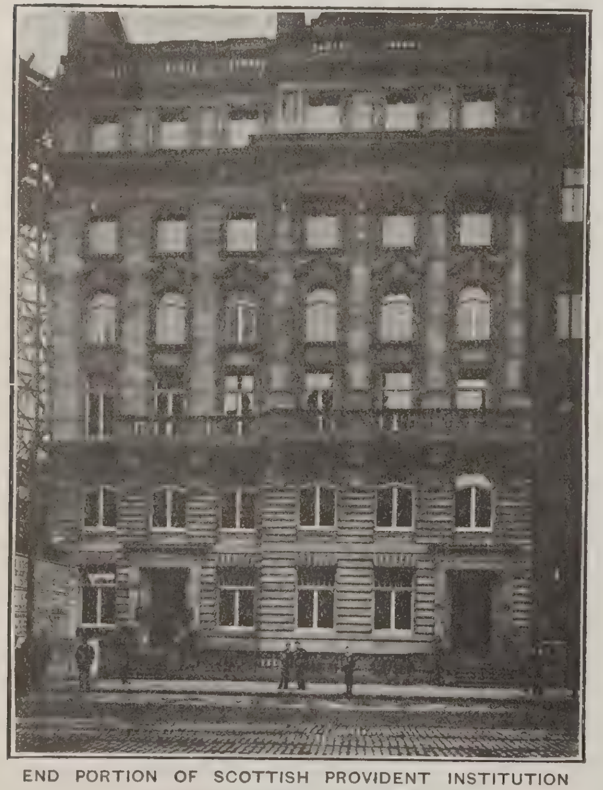
At Govan the branch of the Glasgow Savings Bank has been rebuilt, and was opened last week. The illustration on the next page shows the building. The ground-floor storey is faced with polished Peterhead granite, and the upper portion with red Locharbriggs sandstone. The tower is somewhat novel, the upper part being elliptical. Mr. Eric A. Sutherland, of Glasgow, was the architect.

New Bank in St. Enoch Square.

In St. Enoch Square another new building is in course of erection for the National Bank of Scotland. The bank occupies the ground floor and basement, while above are five floors of warehouses. The main front is constructed of stone, faced on the ground floor with dull-polished Peterhead granite, and above with Plean stone—a close-grained white freestone from Stirlingshire. With the exception of this front, the construction is entirely of steel framing, which is encased with concrete. Floors are of reinforced concrete beams



SCOTTISH PROVIDENT INSTITUTION BUILDING, ST. VINCENT STREET.
J. M. DICK-PEDDIE, ARCHITECT.



END PORTION OF SCOTTISH PROVIDENT INSTITUTION BUILDING, FIRST COMPLETED.

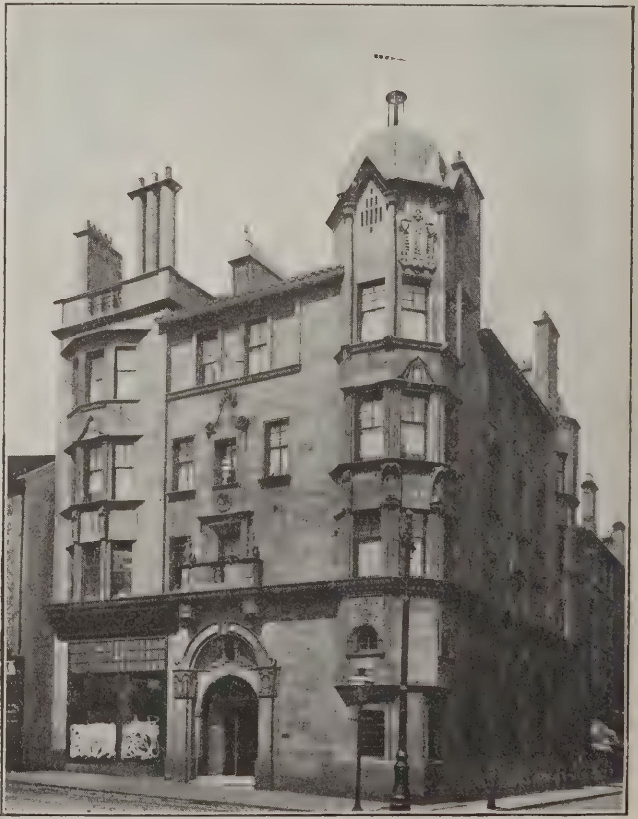


Photo: Annan

SAVINGS BANK, ANDERSTON. SALMON & SON & GILLESPIE, ARCHITECTS.

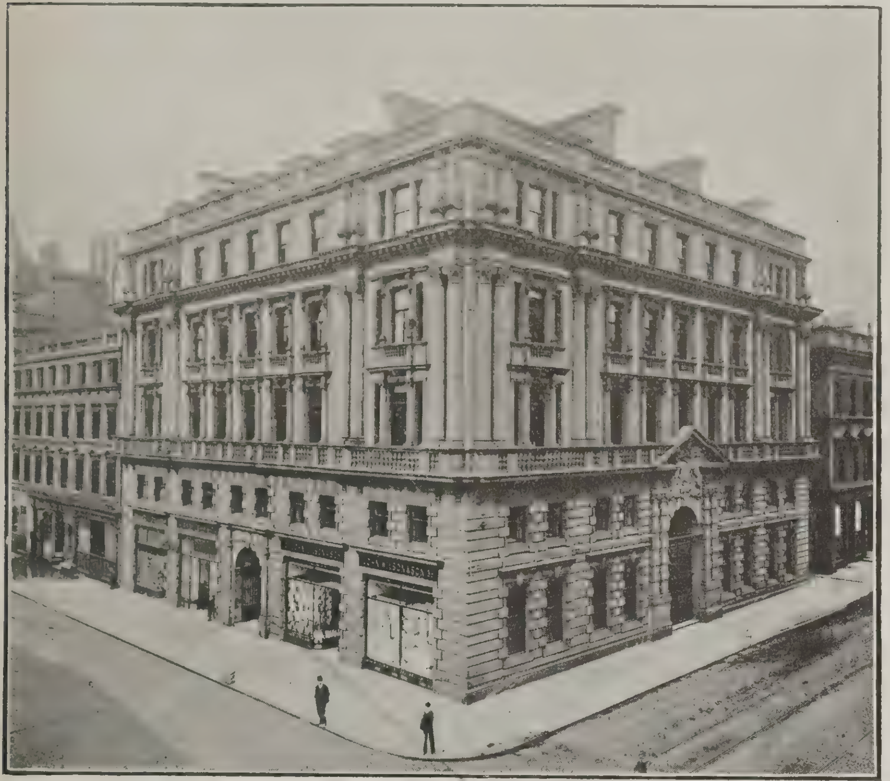


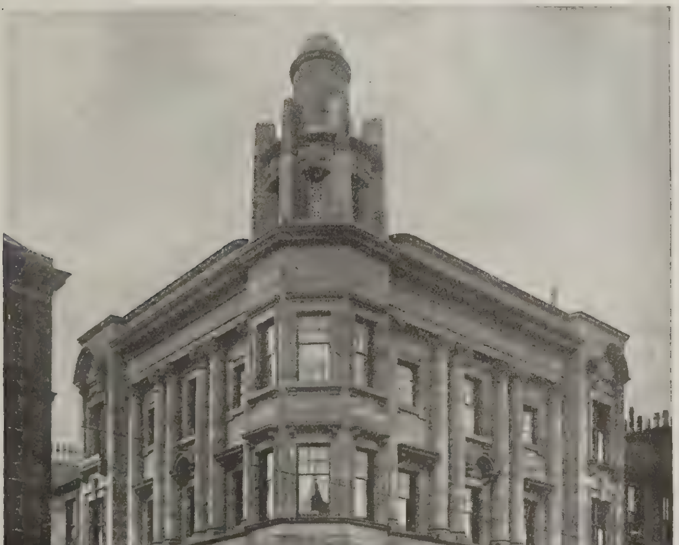
Photo: Arnaud.

NATIONAL BANK OF SCOTLAND, ST. VINCENT STREET AND BUCHANAN STREET. J. M. DICK-PEDDIE, ARCHITECT.

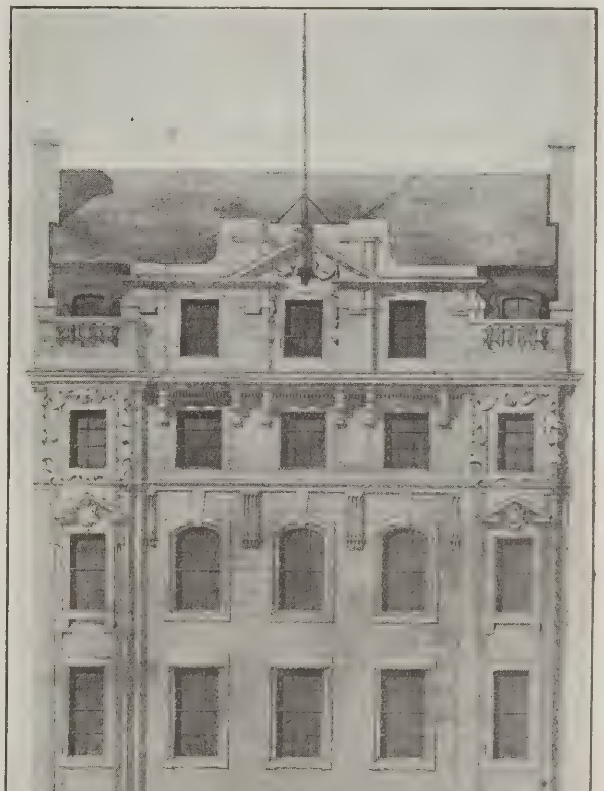
combined with flat tubular lintels, also of concrete. The front Mansard roof is constructed of steel, with wood purlins, and the back roof of reinforced concrete, covered with Val de Travers asphalt. The window casements of the Bank are in bronze, with lettering shield and bosses of the same material over and around the entrance: elsewhere all sashes are of steel, glazed with plate glass. The floor of the public space in the banking room is finished in marble mosaic in black and white, the walls are panelled in plane-tree wood and Spanish mahogany, and the fittings themselves are of the latter wood with green Elterwater stone base. The architect is Mr. A. N. Paterson, M.A., A.R.I.B.A., with whom was associated, as consulting engineer, the late Mr. C. R. Bonn, who, in this, as in all his work, displayed exceptional ability in the steel construction and design, and whose services in this connexion will be much missed in Glasgow and the West of Scotland. The figure sculpture is being carried out by Miss Archibald, who has recently executed the monumental figures over the entrance of Messrs. McGeoch's warehouse, referred to later.

The following are the contractors for the building (of Glasgow, except where otherwise stated) :—

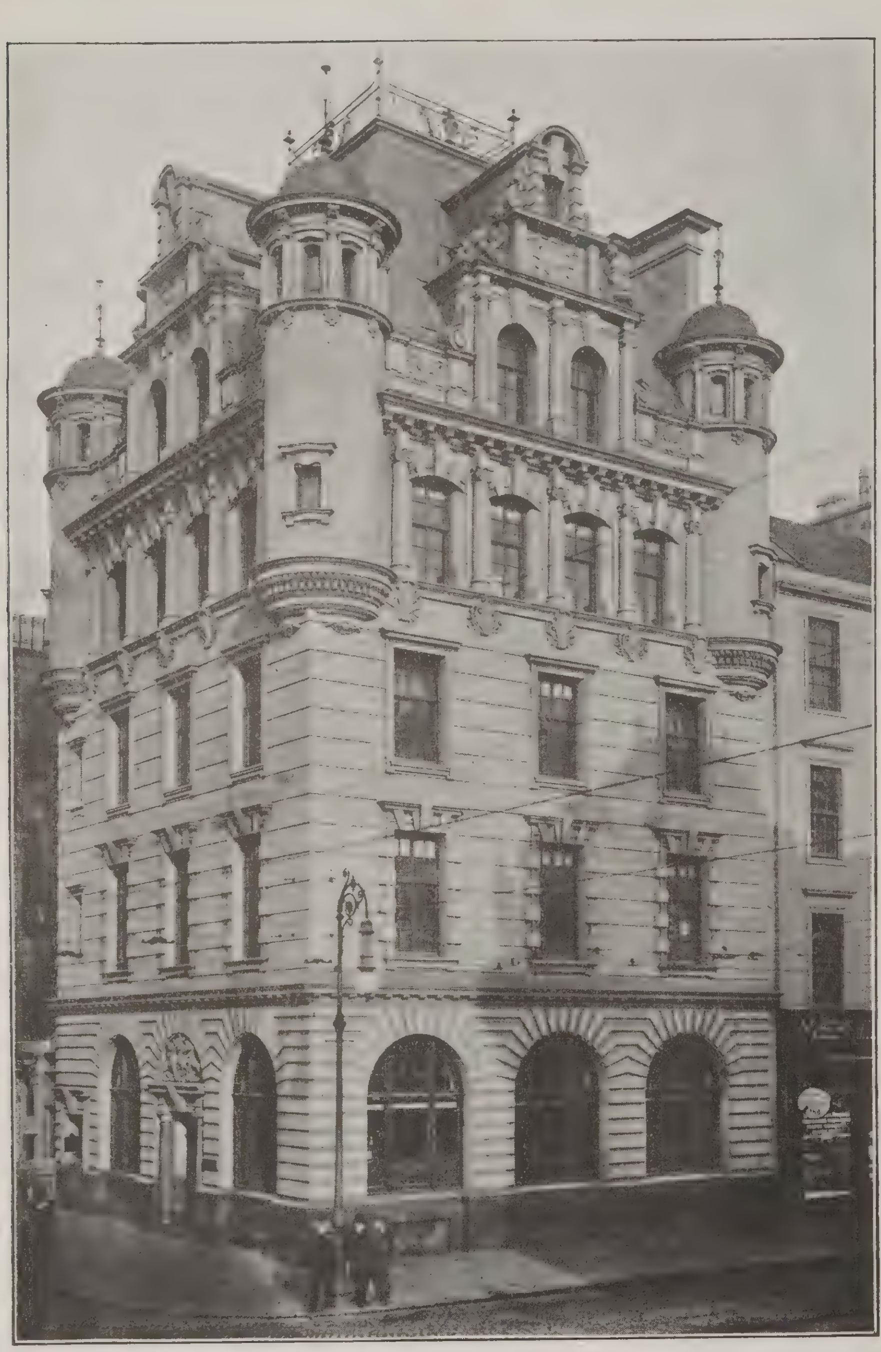
Mason work, Alex. Muir & Son; *wright work*, Wm. McCall & Sons; *plumbing*, James Johnston & Son; *iron and steel work*, Redpath, Brown & Co., Ltd.; *bank linings and fittings*, John Reid & Son; *plasterwork and granolithic paving*, John Forbes; *slating*, Hamilton & Co.; *glazing*, Wm. Meikle & Sons; *painting*, J. B. Bennett & Sons; *tile and marble work*, Galbraith & Winton; *lifts*, A. & P. Steven; *steel sashes*, F. Braby & Co., Ltd.; *granite work*, Alex. McDonald & Co., Ltd., Aberdeen; *fire-resisting flooring*, Wm. Little & Sons, Ltd., Edinburgh.



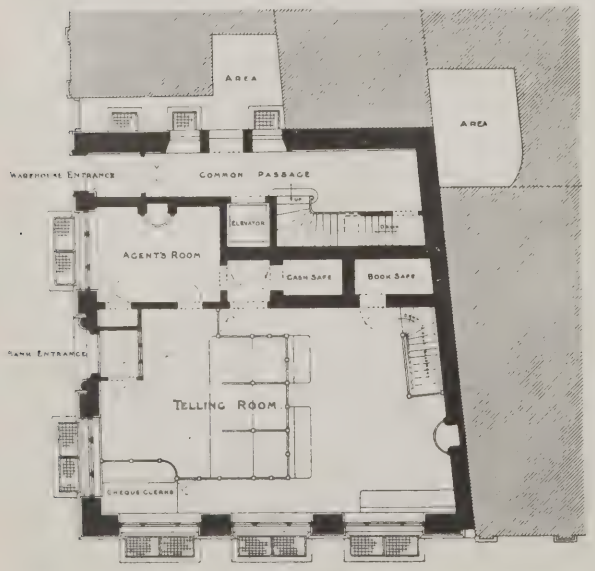
SAVINGS BANK, GOVAN. ERIC A. SUTHERLAND, ARCHITECT.



NATIONAL BANK OF SCOTLAND, ST. ENOCH SQUARE. ALEXANDER N. PATERSON, M.A., A.R.I.B.A. ARCHITECT



NATIONAL BANK OF SCOTLAND, TRONGATE AND GLASSFORD STREET.
THOMAS P. MARWICK, A.R.I.B.A., ARCHITECT



Trongate.

New Bank in Trongate.

At the corner of Trongate and Glassford Street a building for the National Bank of Scotland has been erected. Mr. Thomas P. Marwick, of Edinburgh, was the architect. The site possesses some little historic interest, as on it stood the east wing of the Shawfield mansion where Prince Charles Stuart resided in 1745. The ground occupied by the new building is comparatively small, being only about 46ft. square, and the bank itself occupies nearly the whole of the street and basement floors. The design is treated with horizontal bands of masonry. The corners are emphasised by turrets, between which are dormer windows flanked by sculptured figures, the whole being crowned with a steep pyramidal roof. The walls are of light-coloured sandstone from the Plean quarry. The sculpture and carving work is by Mr. W. Birnie Rhind, R.S.A.

The contract was carried out by Messrs. Alex. Muir & Son, the sub-contractors being :—

Carpenter and joiner work, James Morrison; *plumbing*, W. Anderson; *plasterwork*, George Rome & Co.; *slating*, J. McOuat & Co.; *painting*, J. B. Bennet & Sons; *marble and tile work*, Galbraith & Winton; *fire-resisting floors*, Rud. A. Stoffert; *leaded glazing*, Meikle & Son; *heating*, Mackenzie & Moncur; *electric lighting*, W. Bryden & Son; *safes and safe doors*, Chatwood, Ltd.; *lift*, Otis Co.

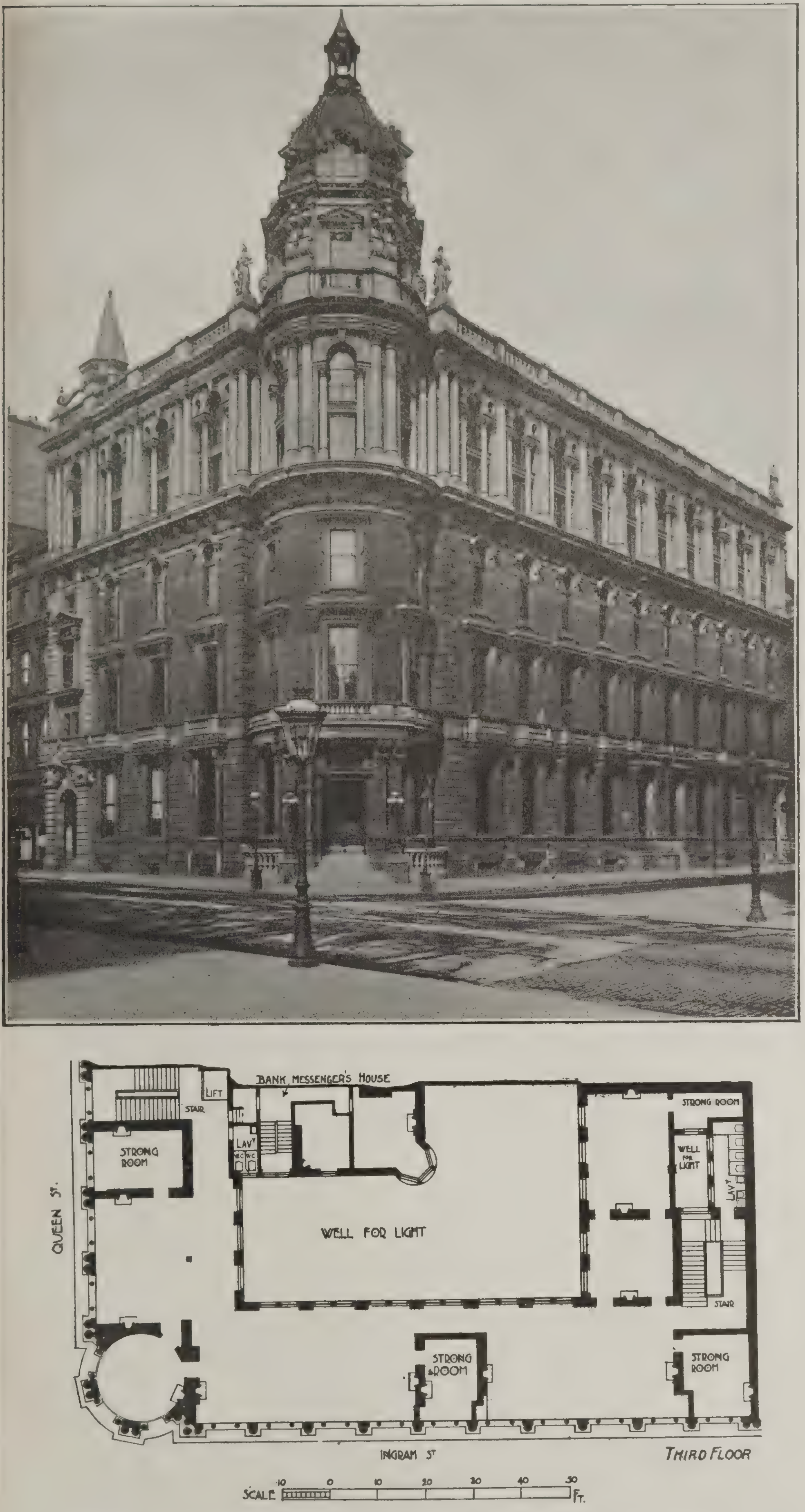
British Linen Bank.

At the corner of Queen Street and Ingram Street is a large building of the British Linen Bank, which has been remodelled, and has had two storeys and staircase added under the direction of Messrs. Salmon and Son and Gillespie, of Glasgow. The view on the next page shows the building as it was when the new work was completed last year. Since then a preservative liquid has been applied to the stonework, and the upper storeys, with the end portion on the Queen Street elevation, now look as blackened as the rest of the building (which was erected sixty years ago). In this bank Messrs. Salmon and Son and Gillespie had of course to make their new work in conformity with the old.

The following is the list of contractors (of Glasgow, except where otherwise stated) :—

Mason work, Alex. Muir & Sons; *joinery and slating*, Wylie & Lochhead, Ltd.; *plumbing*, Wallace & Connell; *plastering*, D. & J. MacKenzie; *painting*, C. T. Bowie Fisher & Co.; *tile and marble work*, Galbraith & Winton; *heating*, James Combe & Son; *electric wiring*, Anderson & Munro; *electric passenger lift*, R. Waygood & Co., Ltd., London; *lift enclosures, wrought iron gates,*

BRITISH LINEN BANK: QUEEN STREET ENTRANCE TO OFFICES ON UPPER FLOORS.



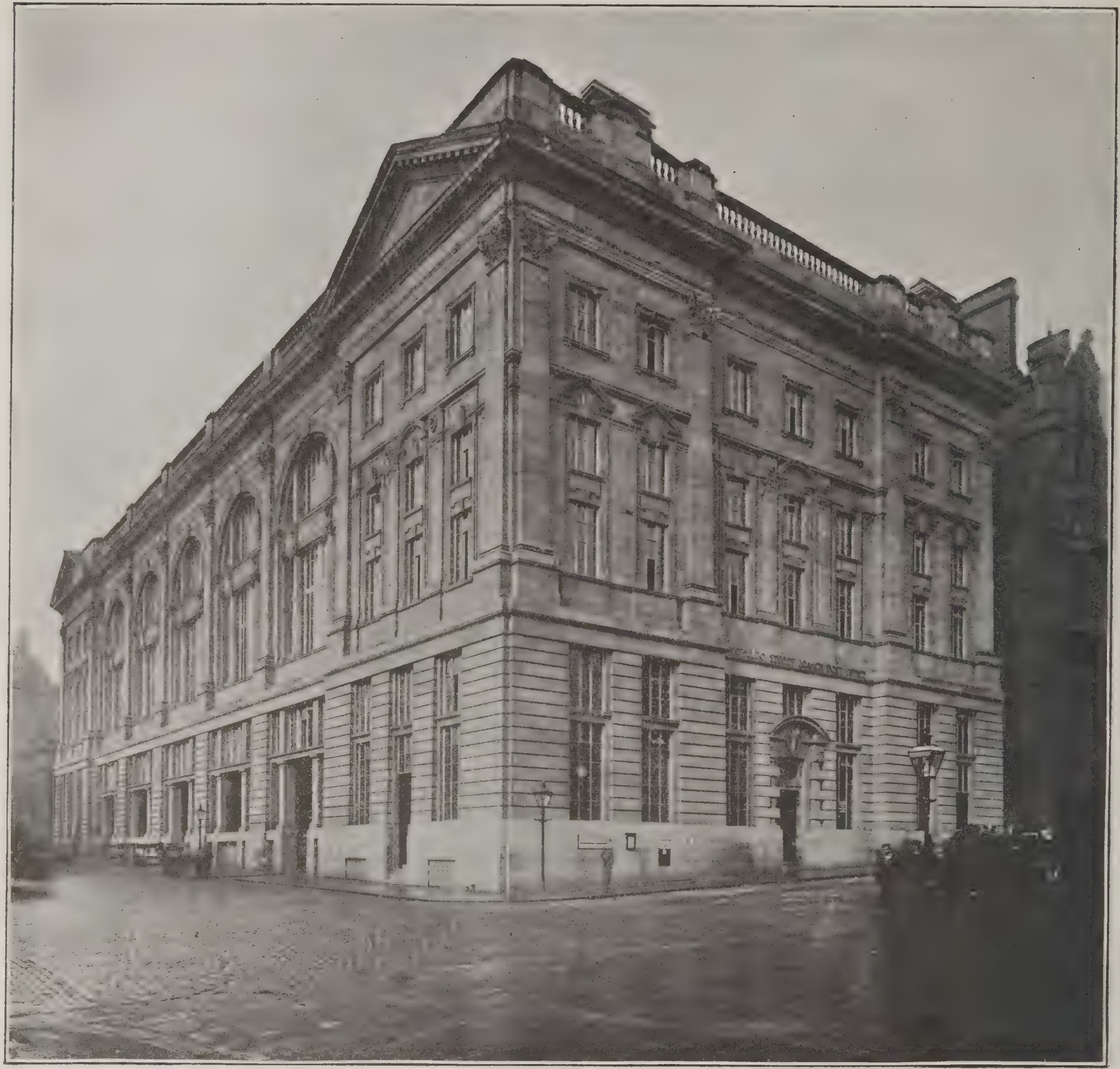
BRITISH LINEN BANK, CORNER OF QUEEN STREET AND INGRAM STREET, GLASGOW.
SALMON AND SON AND GILLESPIE, ARCHITECTS.

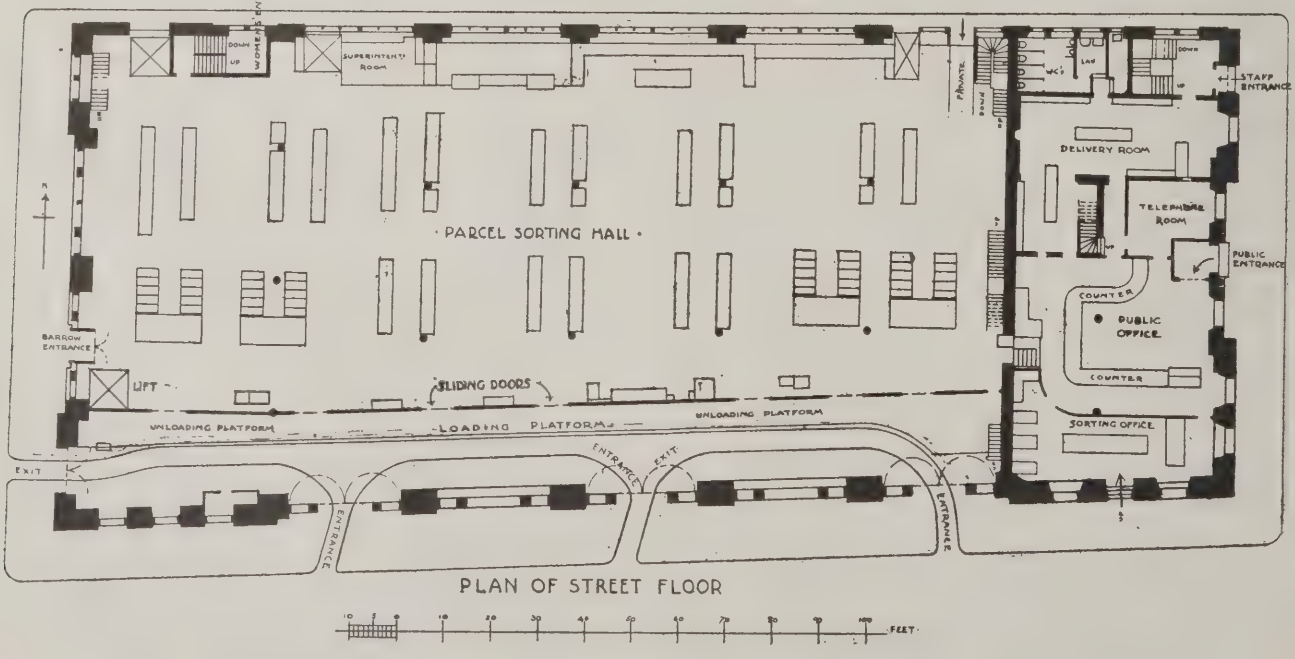
stair railings, &c., George Adam & Son; *hydraulic book lift for bank*, A. & P. Steven; *ventilating fans*, James Keith & Blackman Co., Ltd.; *ironmongery*, J. L. McIndoe & Co.; *stone carving*, George Gregory and Richard Ferris; *sculpture work*, Johan Keller; *grates, &c.*, J. Caird Parker & Co.; *grate and lamp in bank telling room*, Bromsgrove Guild, Bromsgrove; *safe doors in offices, &c.*, Donald Clerk & Son, Ltd. *Clerk of works*, Mr. Alex. McLay.

The new Parcels Post Building.

To cope with the increase of postal business in Glasgow, additions have been made from time to time to the General Post Office in George Square, but there was a limit to the space available for extensions, and eventually it was decided to remove the parcels-post work to a new building on a site in Waterloo Street, about half-a-mile westward. Though nominally only three storeys, the building rises to a general height of 91ft. above the pavement, this unusual height being due to the large areas of the sorting halls, necessitating a head-room of 25ft. With the exception of a small portion on the Wellington Street side used as a branch post-office, the whole of the street floor is occupied as a sorting hall, with a loading platform and covered van-way 180ft. long entered from Waterloo Street through archways. Here all parcels will be received, handled by the sorters on this floor, or shot up on one of the four electric lifts to the sorters on the first floor, and returned to the loading platform ready for the delivery vans. The sorting hall on the first floor has a floor area of 18,715ft. super. The second floor of the building is at present unappropriated. These great apartments are well lighted by large windows on three sides, with top-lights on the upper floor. The walls are lined from floor to ceiling with ivory white glazed bricks, having skirting and cornice picked out in colour. Floors are of wood blocks. On the Wellington Street side, above the branch post-office, are four floors occupied mainly by the postal engineers' and other departmental offices, together with cloakroom and lavatory accommodation; a large dining-room with kitchen and servery are also provided. Under the whole building is a high, well-lit basement, divided up for the various departmental stores, the electric lifts running down to same. The building is of fire-resisting construction throughout, and is faced with a cream-coloured freestone from Northumberland with a high granite plinth: the stonework has been treated with preservative solution to withstand the Glasgow atmosphere. The main front is divided into five arched bays, each 32ft. wide by 72ft. high, with a pedimented wing at each end. The building has been erected from designs prepared in H.M. Office of Works, Edinburgh, under the direction of Mr. W. W. Robertson, H.M. late Principal Architect for Scotland, amended and carried out by Mr. W. T. Oldrieve, H.M. present Principal Architect for Scotland. The total cost will be about £80,000. The general contractors are Messrs. P. & W. Anderson, of Glasgow, the clerks of works being Mr. James Hislop and Mr. G. H. Daymond. The sub-contractors are as follows (of Glasgow, except where otherwise stated):—

Joinery, John Cochrane; *cast-iron work*, Campbell, Binnie & Co.; *steelwork*, Redpath, Brown & Co.; *stone carving*, Holmes & Jackson; *plumbing*, Wm. Anderson; *plastering*, McGilvray and Ferris; *painting*, Charles Carlton & Sons; *glazing*, W. Meikle & Son; *fittings*, J. & T. Scott, Edinburgh; *heating*, Charles Ritchie & Co., Edinburgh; *window casements*, George Wragge, Ltd., Manchester; *wood-block flooring*, E. B. Burgess & Co., Liverpool; *electric lighting*, John Finlay & Co.; *lifts*, A. & P. Steven; *revolving shutters and collapsible gates*, The Folding Gate Co.; *wrought-iron gates and grilles*, Charles Henshaw, Edinburgh; *pavement and stall-board lights*, Thaddeus Hyatt & Co., London.





NEW PARCELS POST BUILDING, WATERLOO STREET. W. T. OLDRIEVE, H.M. PRINCIPAL ARCHITECT FOR SCOTLAND.

District Hospitals.

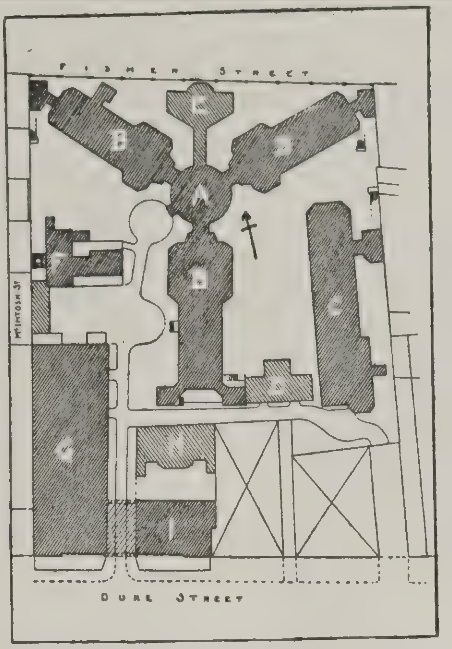
Three large district hospitals have been provided in Glasgow within the last few years—the Stobhill (or Central), the Eastern, and the Western.

The Stobhill Hospital was completed last year, Messrs. Thomson and Sandilands, of Glasgow, being the architects. The design was the outcome of a competition. Provision is made for about 1,650 patients. There are beds for over 800 cases in the hospital proper; accommodation for nearly 600 children; and four wards, containing 240 beds, for ordinary infirm cases of both sexes. The scheme combines therefore a hospital and an infirmary. The total cost was more than £300,000.

The Western District Hospital was completed in 1904. It is planned for 205 patients, made up as follows:—Receiving block 6, medical block 112, surgical block 50, maternity block 37. Owing to the restricted width of the site, considerable difficulty was experienced in placing the blocks so as to meet the requirements of the Local Government Board; the key plan on the next page shows how the difficulty has been overcome. The walls are of brick, with a 2½-in. air-space. Throughout the buildings fire-resisting construction has been adopted. Ward floors are of maple, wax polished, and walls and ceiling finished with Keene's cement. Heating and ventilating is partly by air forced in by fans and partly by air-inlets with radiators directly over them; foul air being extracted through ducts at the side of the chimney flues. The architect of this hospital was Mr. Alex. Cullen, of Glasgow.

The following is the list of contractors (of Glasgow, except where otherwise stated):—

Mason and brickwork, John Paterson & Son, Ltd.; *joiner work*, Andrew Meiklejohn; *slating*, A. Robertson; *plumbing*, R. S. Renfrew; *plastering*, David M'Nair, Falkirk; *tiling*, Cherry & Co.; *heating and ventilating*, Steel & Wilson; *painting*, M'Culloch & Co.; *electric lifts*, Archibald Smith & Stevens, London; *smoke-preventing apparatus*, Robert Brown; *laundry machinery*, D. & J. Tullis, Ltd.; *cooking machinery*, A. & J. Main, Ltd., Falkirk; *electric lighting*, M'Culloch, Potter & Co.; *boilers*, Penman & Co.; *telephones*, National Telephone Co.

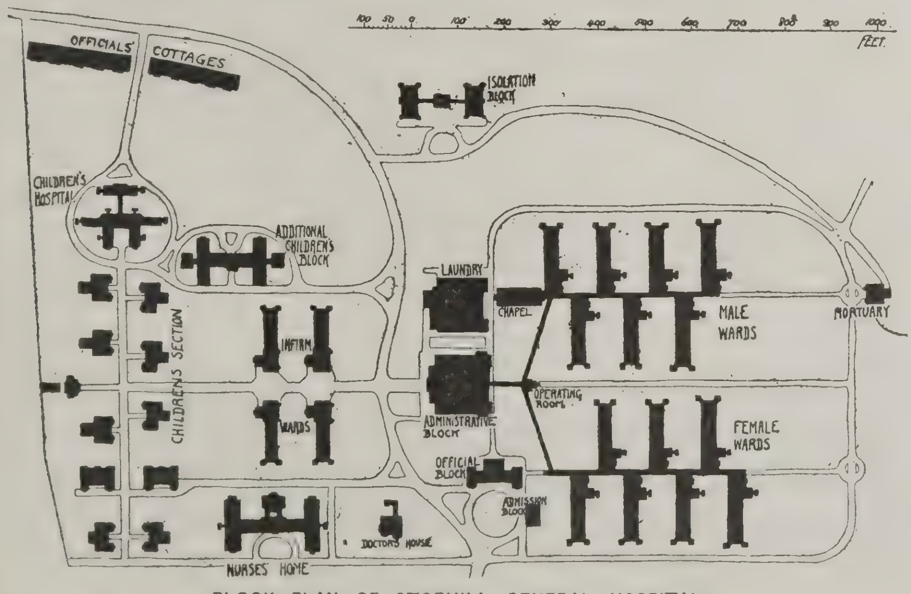


BLOCK PLAN OF EASTERN DISTRICT HOSPITAL; A, staircase block; B, B, B, ward blocks; C, mental block; D, mortuary: E, operating theatre: F, isolation block; G, administrative block; H, probationary block; I, staff block.

The Eastern District Hospital provides accommodation for 244 patients—133 males and 111 females—the male wards being for 72 medical, 25 surgical, and 7 skin cases, and the female wards for 36 medical, 25 surgical, 7 skin, 10 children, and 4 maternity cases. Beds are also provided for 44 mental cases. In addition there are the usual isolation blocks, operating theatre, mortuary, &c., together with a large administration block (shown in the view on the next page). Here, as at the Western Hospital, the restricted nature of the site made it difficult to plan the buildings satisfactorily. Mr. Hessell Tiltman, the architect, adopted the radial system for the ward blocks, in order to secure the maximum amount of sunshine and air.

Western Infirmary.

At the Western District Infirmary, where Mr. J. J. Burnet, of Messrs. John Burnet & Son, has done such masterly hospital work, in altering and adding to his father's design to meet more modern requirements, a new wing has recently been completed; it was opened last month. This new wing consists mainly of three large wards, 81ft. by 28ft. by 14ft. 8ins., with appurtenant rooms. The wards are tiled for a height of 6ft. 6ins., and finished above in Parian cement, enamelled: ceilings are concave. Floors are of fire-resisting construction and covered with polished teak blocks. Heating is on the "Reck" system, a radiator being fixed under each window, with direct air inlet, and a slow-running fan provided at the top of the building for extracting the vitiated air. Two towers at corners of the wards serve as sanitary annexes, being connected to the wards by cross-ventilated passages. The baths are of a special pattern, and the Glasgow Western Infirmary is the first institution in which they have been used. The bath is of enamelled iron and turns on a swivel at the tap, water being supplied from a fitting on the wall, which has a special mixer worked by a key. This form of bath enables every part of the room to be kept clean.



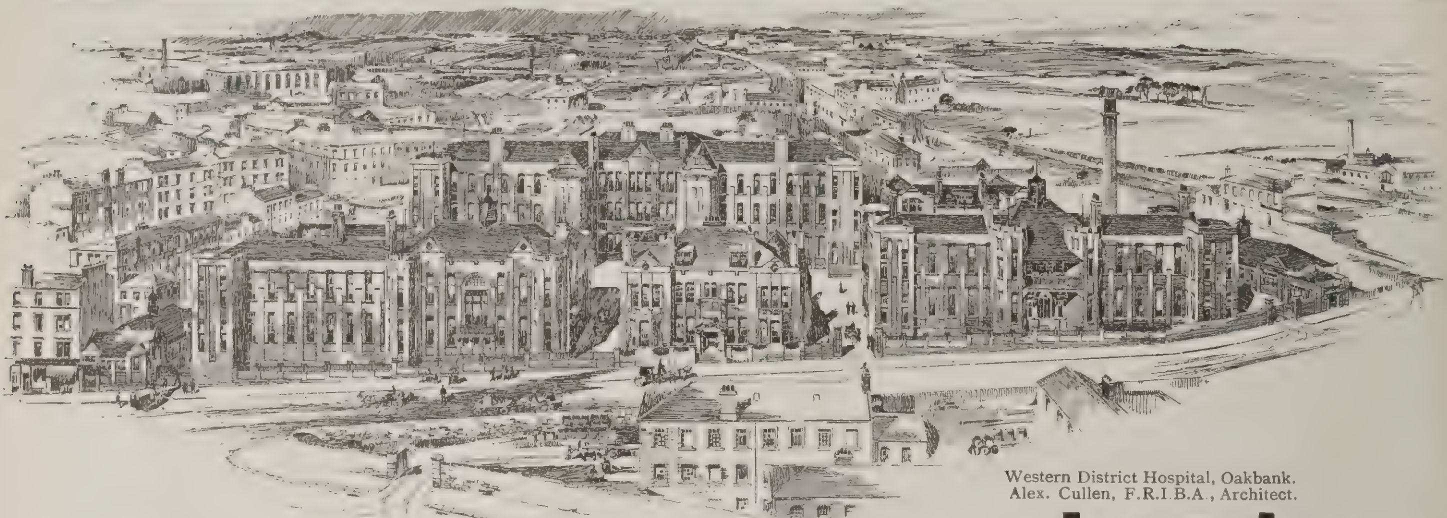
BLOCK PLAN OF STOBHILL GENERAL HOSPITAL.

The Royal Infirmary.

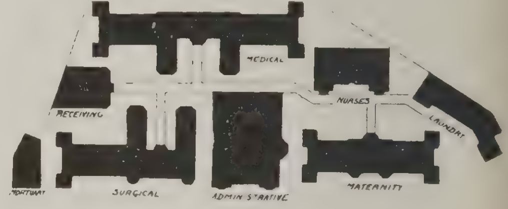
A large work now in progress is the rebuilding of the Royal Infirmary. This building has been the occasion of a considerable amount of feeling. It will be remembered that a competition for the design was held about six years ago, after the Managers had for two years been trying to get what they wanted from an architect selected by themselves. In the competition ten architects were invited to submit designs, and the committee drew up on its own account two "suggestive" sketch plans, an essential feature of both of which was the "Jubilee" block facing Cathedral Square. Most of the competing architects, however, considered this arrangement to be so undesirable, for reasons of light and air, that they found it necessary to depart from the committee's ideas. Sir Rowand Anderson was the assessor, and he made a short leet of four and selected one. The Managers, however, threw over his award and selected the design of Mr. James Miller, which followed the committee's own arrangement. The building faces the ancient cathedral of Glasgow, and will have a frontage of about 600ft., with a depth of 200ft. There will be six floors and basement, with provision for about 670 beds. The portion now being proceeded with is the northern wing of the building, and it is expected to be completed in 1908. The total cost of the scheme is put at over £400,000, which includes a new gatehouse block, pathological building, isolation block, new laundry and power station, dispensary and extension to nurses' home.

Stock Exchange Extension.

In St. George's Place an extension has been made to the Glasgow Stock Exchange. It was opened last April. In its architectural treatment the extension follows the lines of the main building, which is of uninteresting French Gothic type, and was designed by Mr. John Burnet, the founder of the present firm of John Burnet & Son. The ground floor is occupied by offices and a post-office. On the first floor is the new mining market, with telephone corridor and smoking-room. The mining market is 50ft. by 42ft. by 22ft. high, lighted by three windows into St. George's Place. It has more than double the area of the old market, and will eventually be thrown into the present general market. The telephone corridor is more than 100ft. long, and the floor is laid with india-rubber. On the second floor of the building are general office, secretary's room, &c., and on the third floor telegraph instruments room, committee room, and offices. The building is heated on the "Reck" system, and all floors are served by Otis lifts. The architect was Mr. J. J. Burnet.



Western District Hospital, Oakbank.
Alex. Cullen, F.R.I.B.A., Architect.



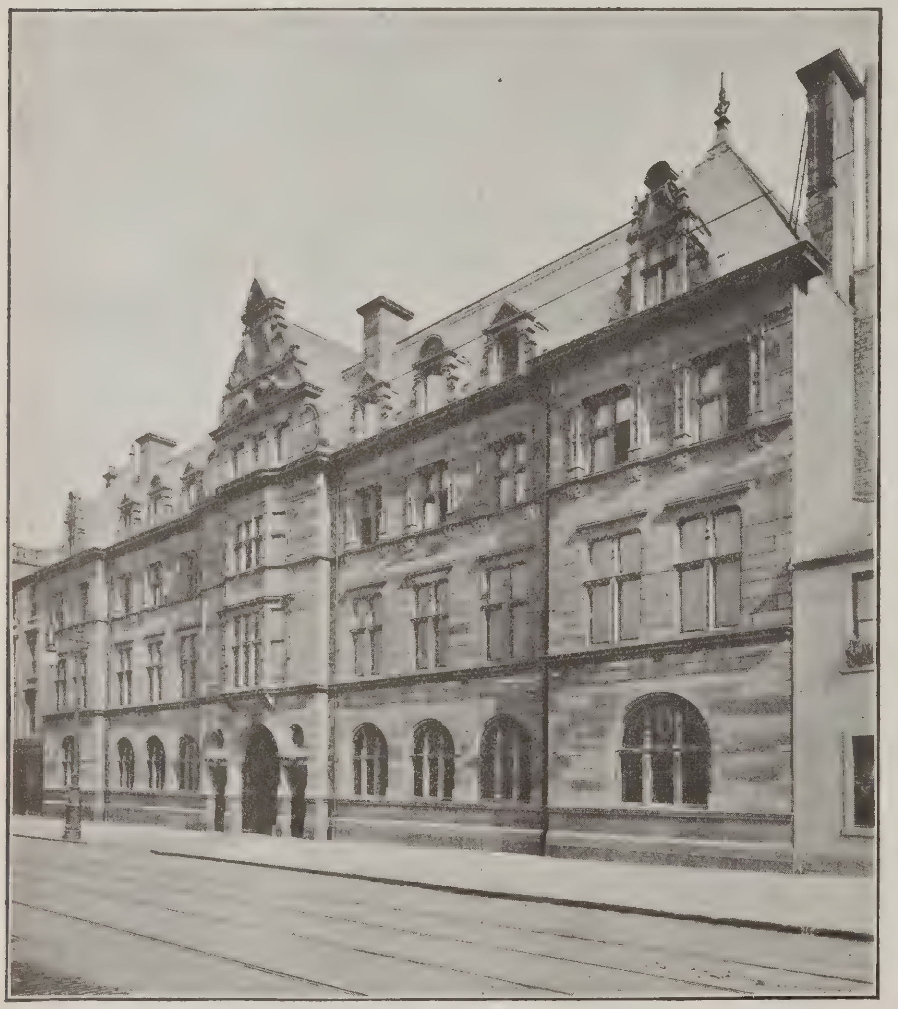
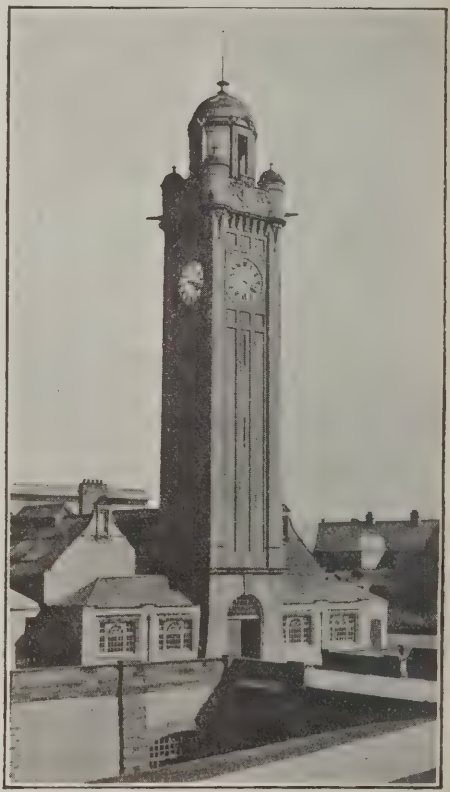


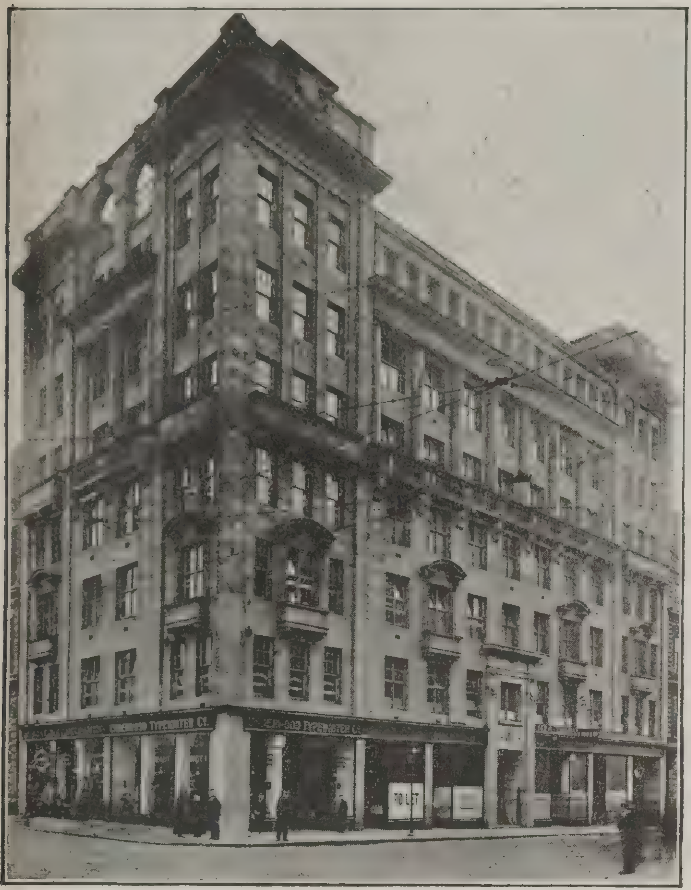
Photo: Lewis, Birmingham.
Eastern District Hospital, Duke Street: Administrative Block. A. Hessell Tiltman, F.R.I.B.A., Architect.



Clock Tower and Administrative Block,
Stobhill General Hospital.

General View of Stobhil General Hospital. Thomson and Sandilands, Architects.

NEW GLASGOW HOSPITALS.



BUSINESS PREMISES, QUEEN STREET AND GEORGE SQUARE.
JAMES MILLER, A.R.S.A., F.R.I.B.A., ARCHITECT.

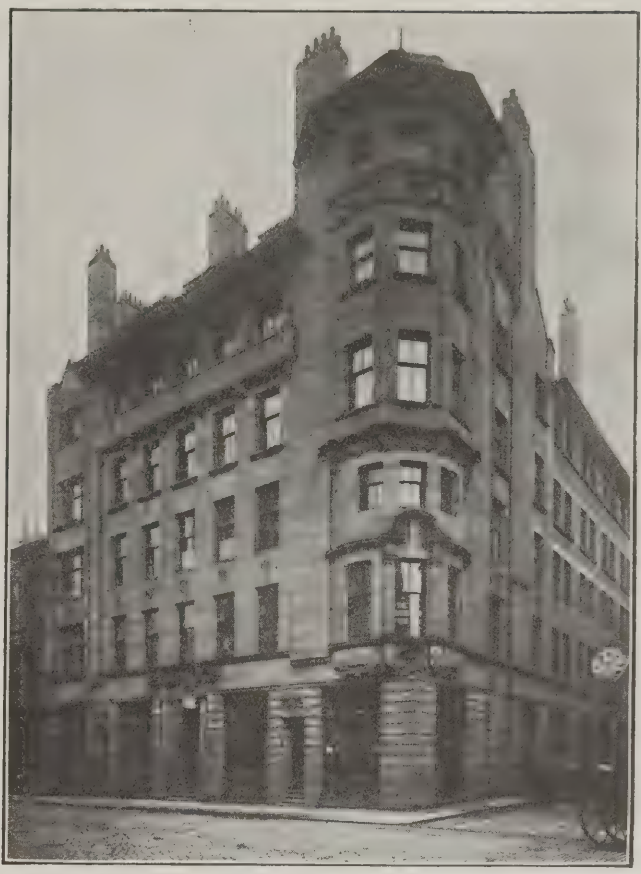


Photo: Annan.

BUSINESS PREMISES, ROBERTSON STREET.
JOHN A. CAMPBELL, I.A., F.R.I.B.A., ARCHITECT.

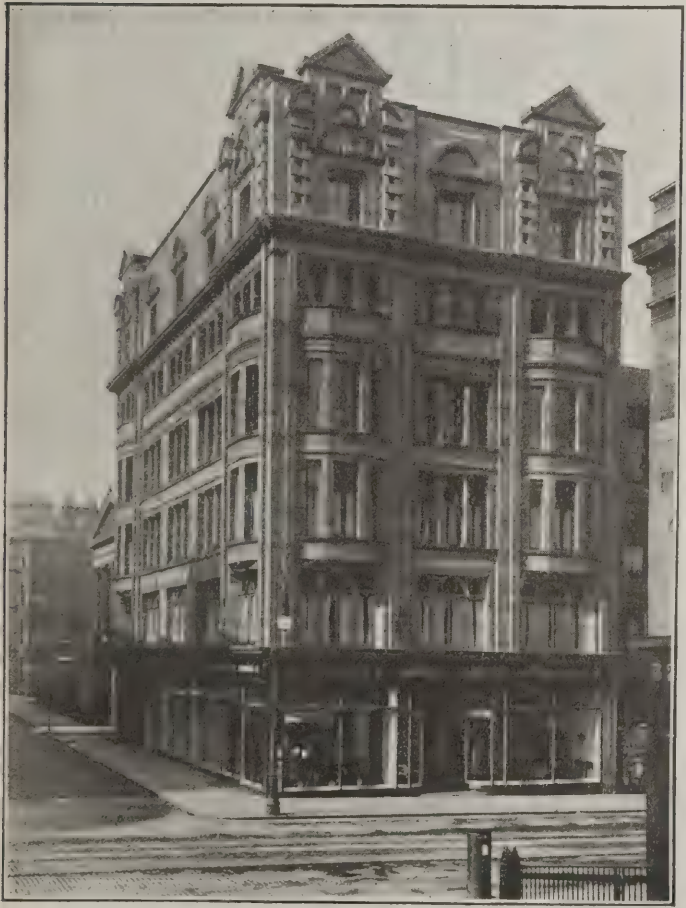


Photo: Bell.

BUSINESS PREMISES, SAUCHIEHALL STREET.
HONEYMAN, KEPPIE AND MACKINTOSH, ARCHITECTS.

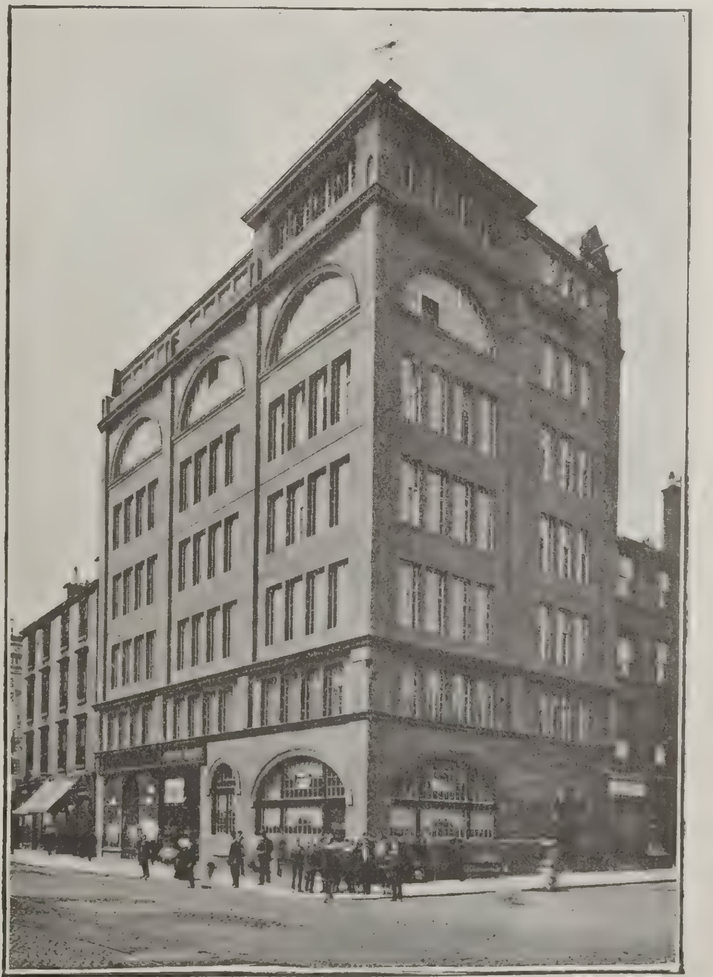


Photo: Lewis, Birmingham.

BANK AND WAREHOUSE, ARGYLE STREET.
P. MACGREGOR CHALMERS, I.A., ARCHITECT.

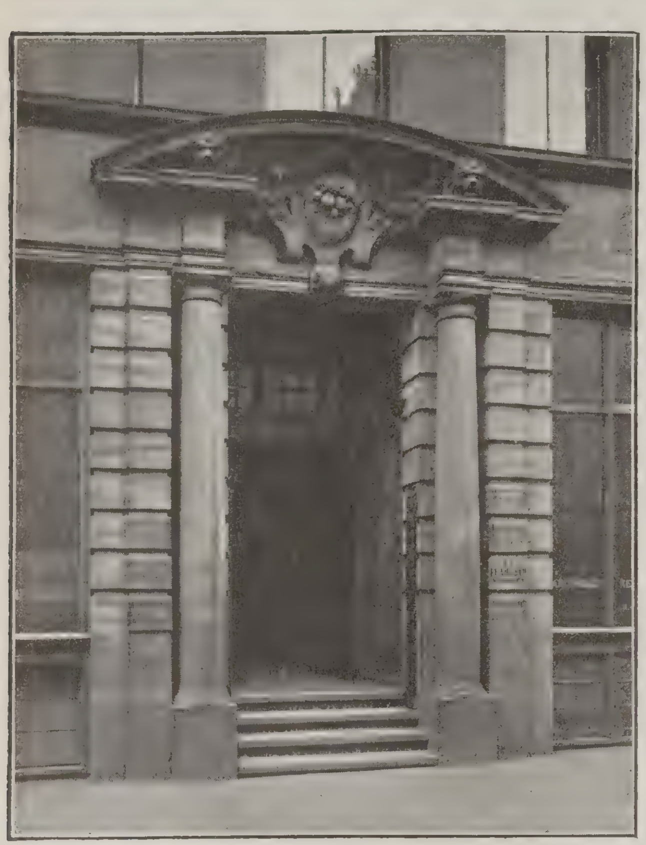
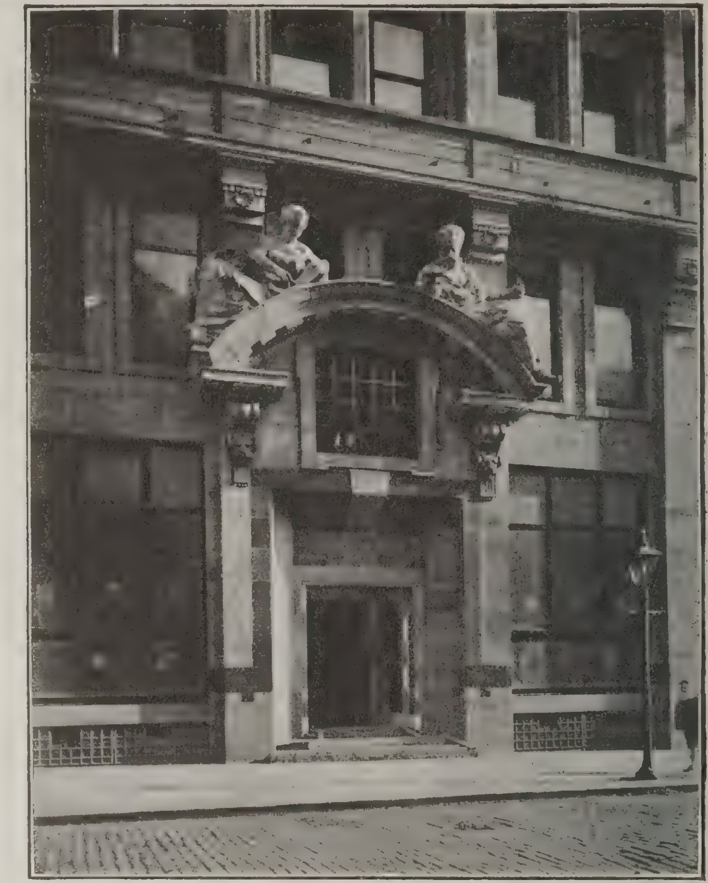


Photo: Annan.

ENTRANCE TO BUSINESS PREMISES, ROBERTSON STREET.
JOHN A. CAMPBELL, I.A., F.R.I.B.A., ARCHITECT.



ENTRANCE TO McGEOCH'S WAREHOUSE, WEST CAMPBELL STREET.
J. J. BURNETT, ARCHITECT.

Warehouses.

The warehouses of Glasgow are notable as excellent examples of their class. They are designed on purely utilitarian lines, but there is a sturdy quality and good proportion about them which calls for special attention. A good recent example is that erected for Messrs. Fraser, Ross & Co., Ltd., in Ingram Street, from designs by Mr. H. E. Clifford see next page). The building does not need lengthy description. The plan, it will be seen, is quite straightforward, and the exterior expresses the plan. Window spacing has been carefully studied, and in each storey the daylight of the windows is flush with the ceiling. The building is erected of Locharbriggs red freestone, and the floors throughout are of "Fram" fire-resisting construction.

The following is the list of contractors (all of Glasgow) :—

Mason work, Alex. Muir & Sons; *wright work*, Sutherland & Leslie; *plumbing*, Moses Spiers & Son; *plastering*, A. Calders & Son; *slating*, John McOuat & Son; *cast-iron work*, M. McCulloch & Co.; *wrought iron work*, Bladen & Co.; *fireproof flooring*, Rud. A. Stoffert.

"Neptune Buildings," at the corner of Argyle Street and Pitt Street, is another good example (see page 261). The architect was Mr. P. Macgregor Chalmers, of Glasgow. The corner of the building has been designed as a bank, and two shops occupy the remainder of the Argyle Street frontage, but the floors above are all devoted to warehouse work. The entrance to the stair and hoist for the upper floors is in Pitt Street. The construction is fire-resisting throughout. The cost of the building, including the alteration of the adjoining property, has been about £11,000.

The following were the principal contractors (all of Glasgow) :—

Mason work, Paterson & Son; *steelwork*, Redpath, Brown & Co.; *fire-resisting floors*, Fergusson & Allan; *steel casements*, Henry Hope & Son, Birmingham; *joinery*, Miller & Murray; *plumbing*, Renfrew & Newall; *plastering*, John Drummond; *glazing*, Meikle & Co.; *asphalt*, Limmer Asphalte Paving Co.

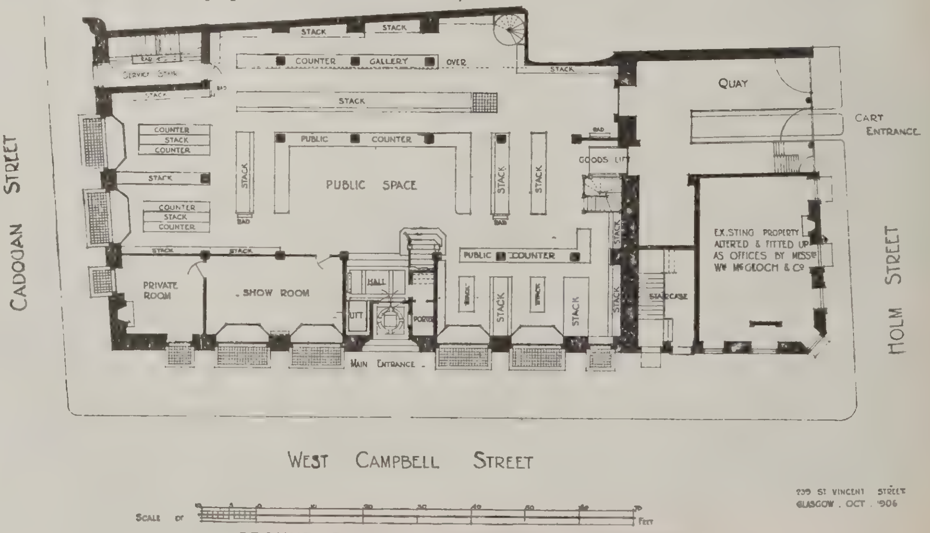
McGeoch's Warehouse.

A notable new warehouse is that now being completed in West Campbell Street and Cadogan Street, for Messrs. William McGeoch & Co., Ltd., dealers in ironmongery, electrical goods, &c. Mr. J. J. Burnet, of Messrs. John Burnet & Son, of Glasgow, is the architect. The building is of red sandstone, and comprises six storeys and basement, a portion of the latter being fitted up as a workshop. In designing the structure the keynote has been efficient lighting of the various floors. With that object in view, the front is divided into a series of bays formed by vertical piers—a striking architectural treatment. The detail inclines towards French Renaissance. The main entrance is centrally placed on the West Campbell Street front, and has a curved pediment with recumbent figures of "Science" and "Industry." Importance is also given to the corner by a circled tower corbelled out, with a winged figure at the base representing "Art."

The following are the contractors for the building (of Glasgow, except where otherwise stated) :—

Mason work, Alex. Muir & Sons; *wright work*, Andrew Meiklejohn; *plumbing*, Alex. Anderson; *glazing*, C. & J. Malloch; *plastering*, George Rome & Co.; *painting*, John Orr & Sons; *fireproof flooring*, Columbian Fireproofing Co., Ltd., London; *heating*, Simpson & Farmer; *tile and marble work*, Galbraith & Winton; *passenger lift*, R. Waygood and Co., Ltd., London; *hydraulic goods lift*, A. & P. Steven; *sculptor work*, Miss Archibald and Holmes & Jackson.

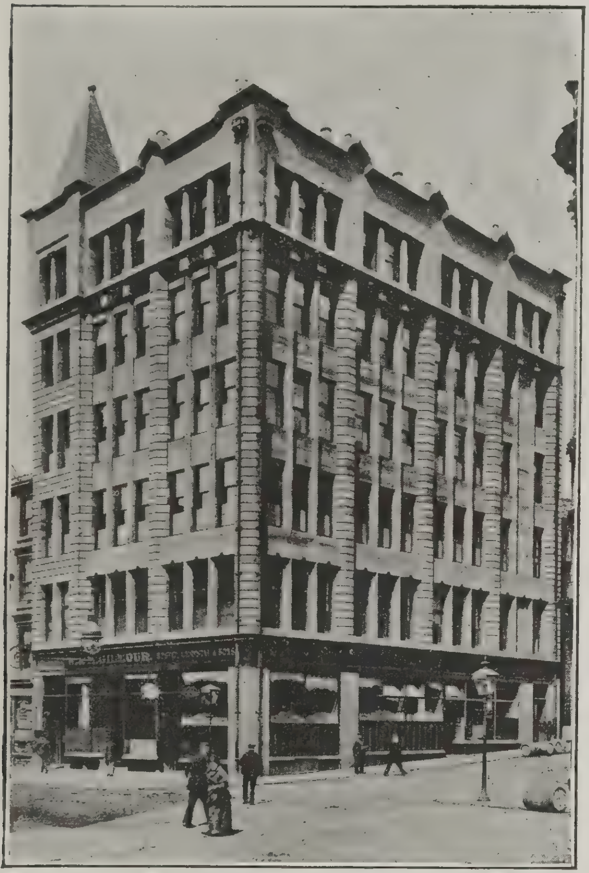
In Robertson Street a new building for Mr. R. E. Buchanan has been erected from designs by Mr. John A. Campbell. The view on page 261 shows the building. The main doorway, an interesting treatment, is illustrated on this page.



GROUND FLOOR OF McGEOCH'S WAREHOUSE.

Messrs. Annan's new Premises.

For Messrs. T. & R. Annan & Sons, the well-known photographers, a new building has been provided in Sauchiehall Street. The front is of red sandstone from Dumfries quarry, and is embellished at third-floor level with two large figures carried on corbels. The ground floor of the building is occupied as a large showroom and saloon, the back portion being devoted to printing rooms in which the firm carries out photogravure and other process work. From the ground floor access is given by a lift and staircase to the studio above and to the upper floors of the building. Messrs. Honeyman, Keppie and Mackintosh were the architects.



WAREHOUSE, INGRAM STREET. H. E. CLIFFORD, F.R.I.B.A., ARCHITECT.

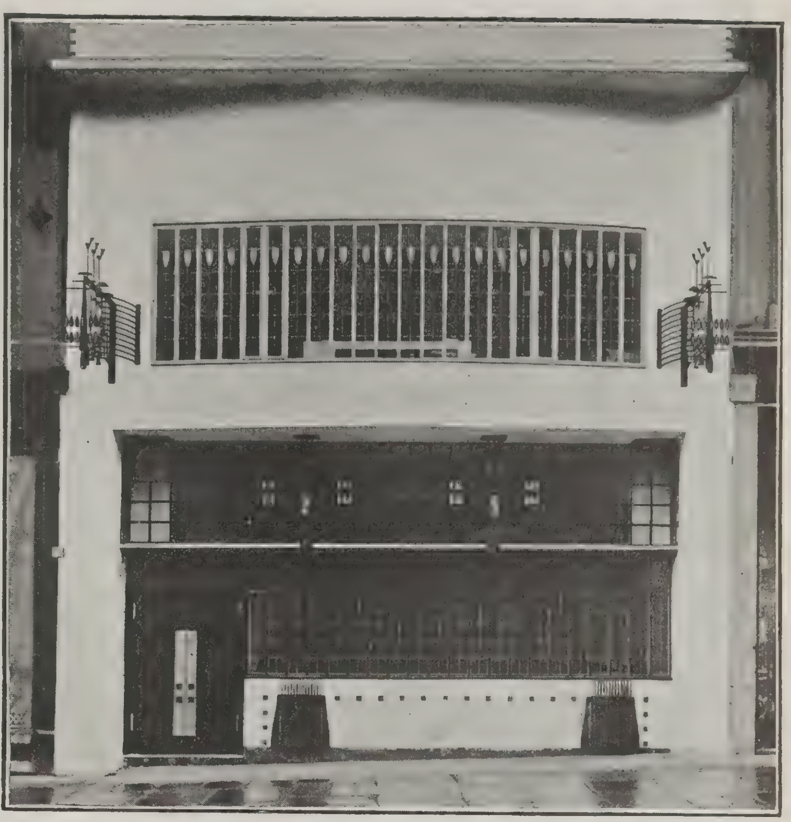
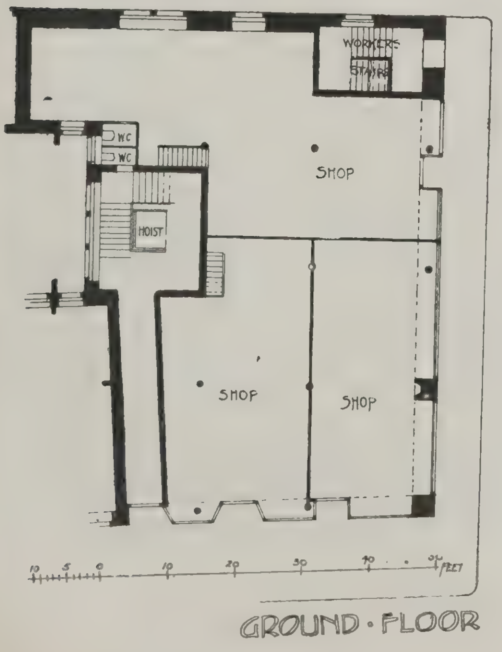


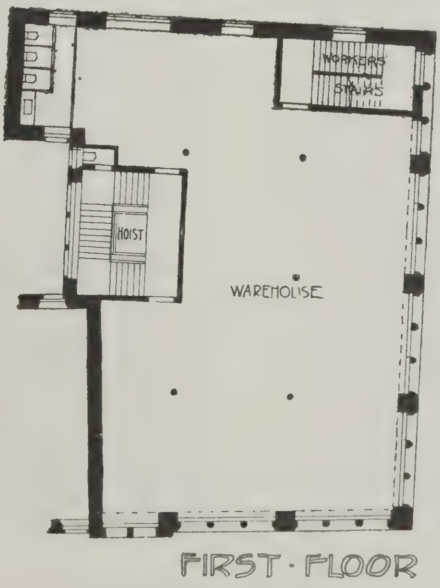
Photo: Rae, Ltd.

MISS CRANSTON'S RESTAURANT, SAUCHIEHALL STREET. HONEYMAN, KEPPIE AND MACKINTOSH, ARCHITECTS.

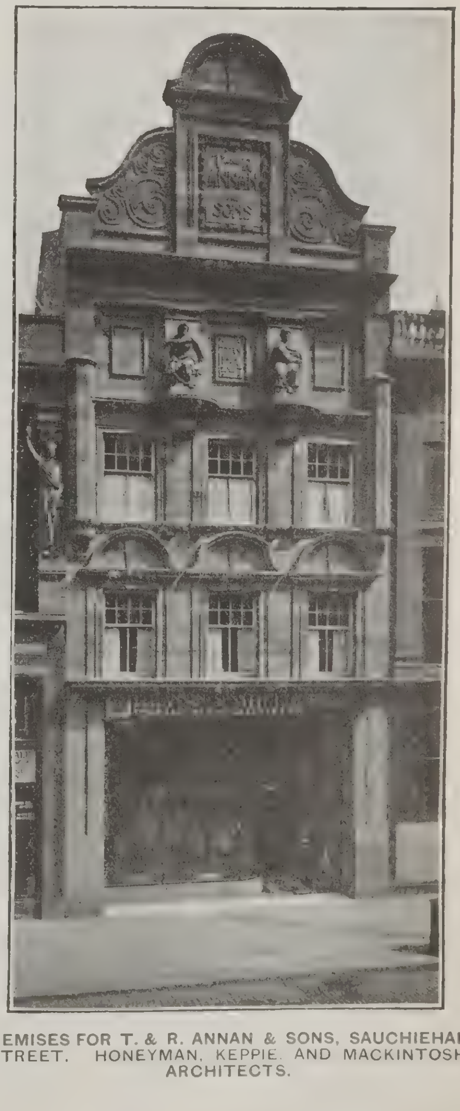
Miss Cranston's new Restaurant.

In Sauchiehall Street another of Miss Cranston's renowned tea-rooms has been completed within the last year, the architects being Messrs. Honeyman, Keppie & Mackintosh. The building is not a new one, but a reconstruction of an old warehouse. The front is finished white, and both inside and outside the building is characteristic of its architect. The ground floor is occupied as a tea-room, with a gallery at the back around the saloon; on the first floor is a ladies' room, known as the "Room de Luxe"; and on the top floor is a billiard-room. The kitchens are on the ground floor.

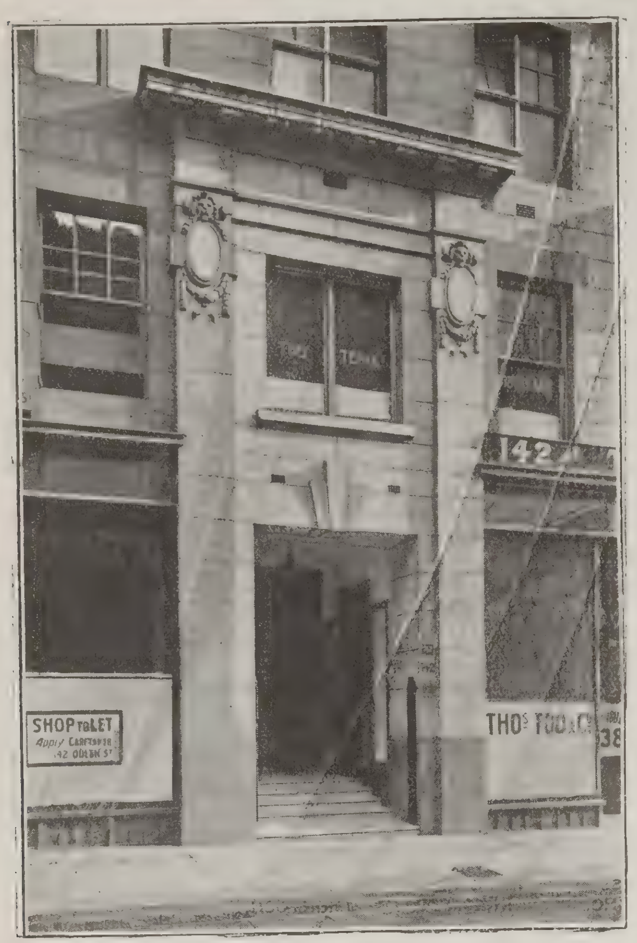




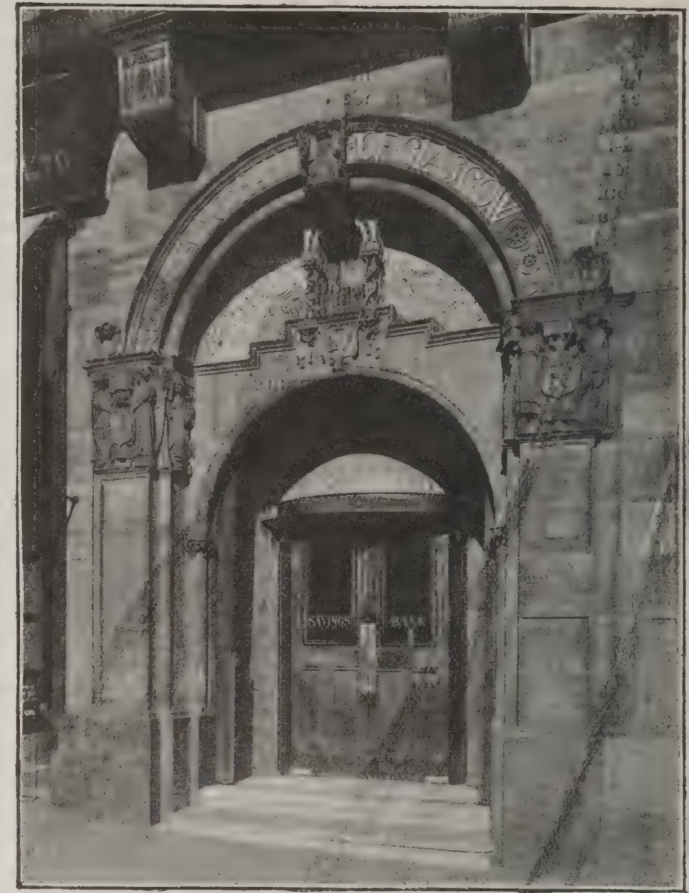
WAREHOUSE, INGRAM STREET.



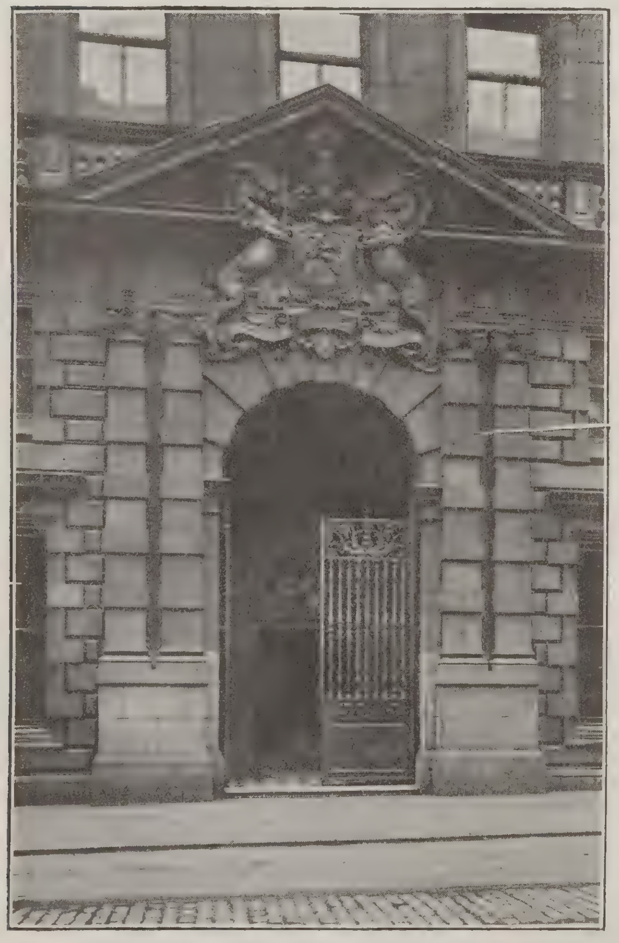
PREMISES FOR T. & R. ANNAN & SONS, SAUCHIEHALL STREET. HONEYMAN, KEPPIE AND MACKINTOSH, ARCHITECTS.



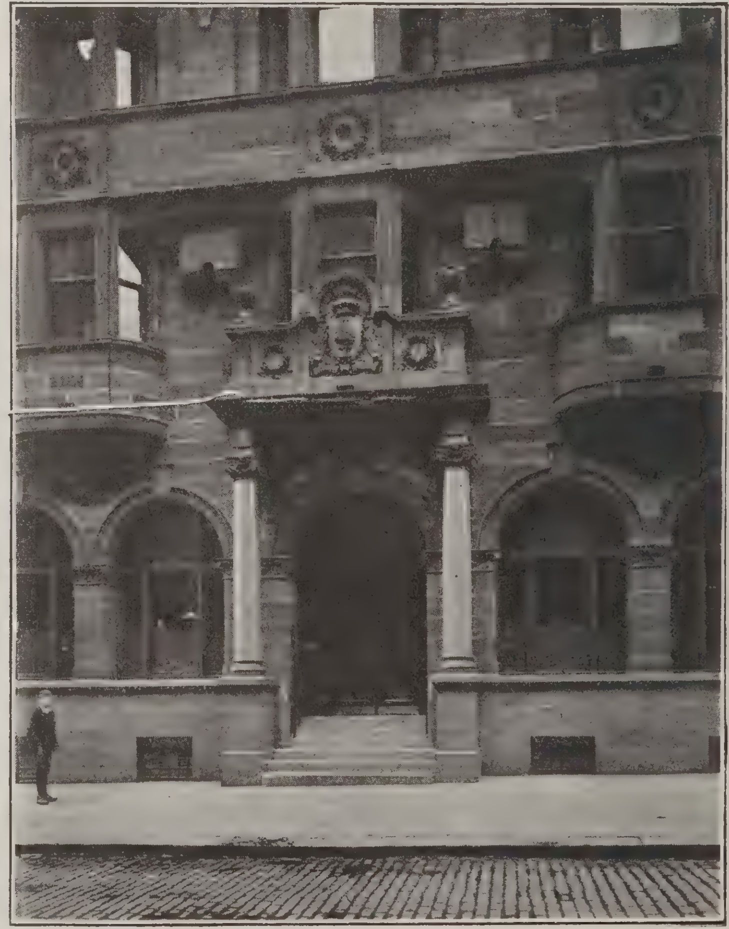
Business Premises, Queen Street.
James Miller, A.R.S.A., F.R.I.B.A., Architect.



Savings Bank, Anderston.
Salmon and Son and Gillespie, Architects.



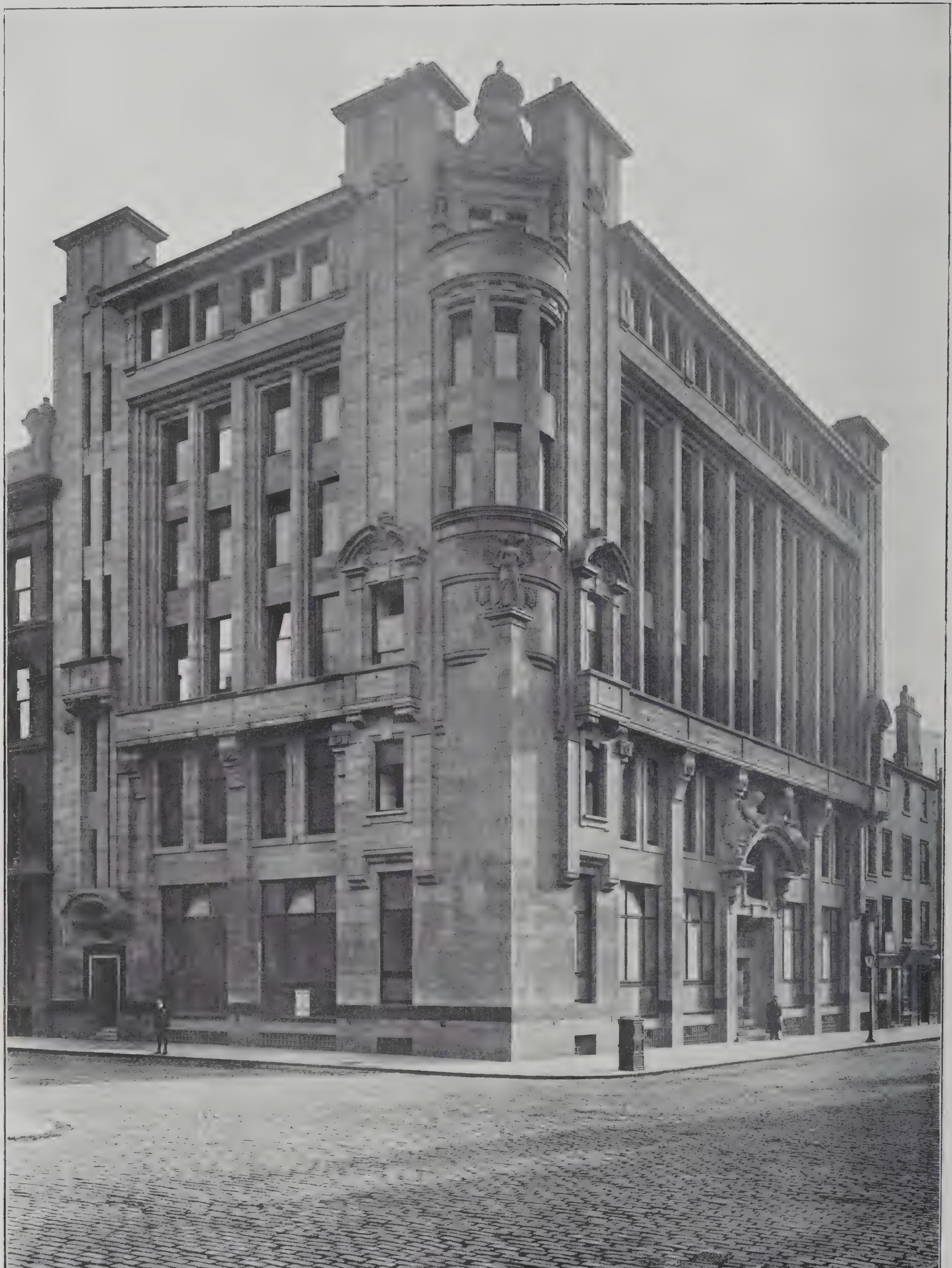
National Bank of Scotland, St. Vincent Street.
J. M. Dick-Peddie, Architect.



Glasgow Parish Council Offices, George Street.
Thomson and Sandilands, Architects,

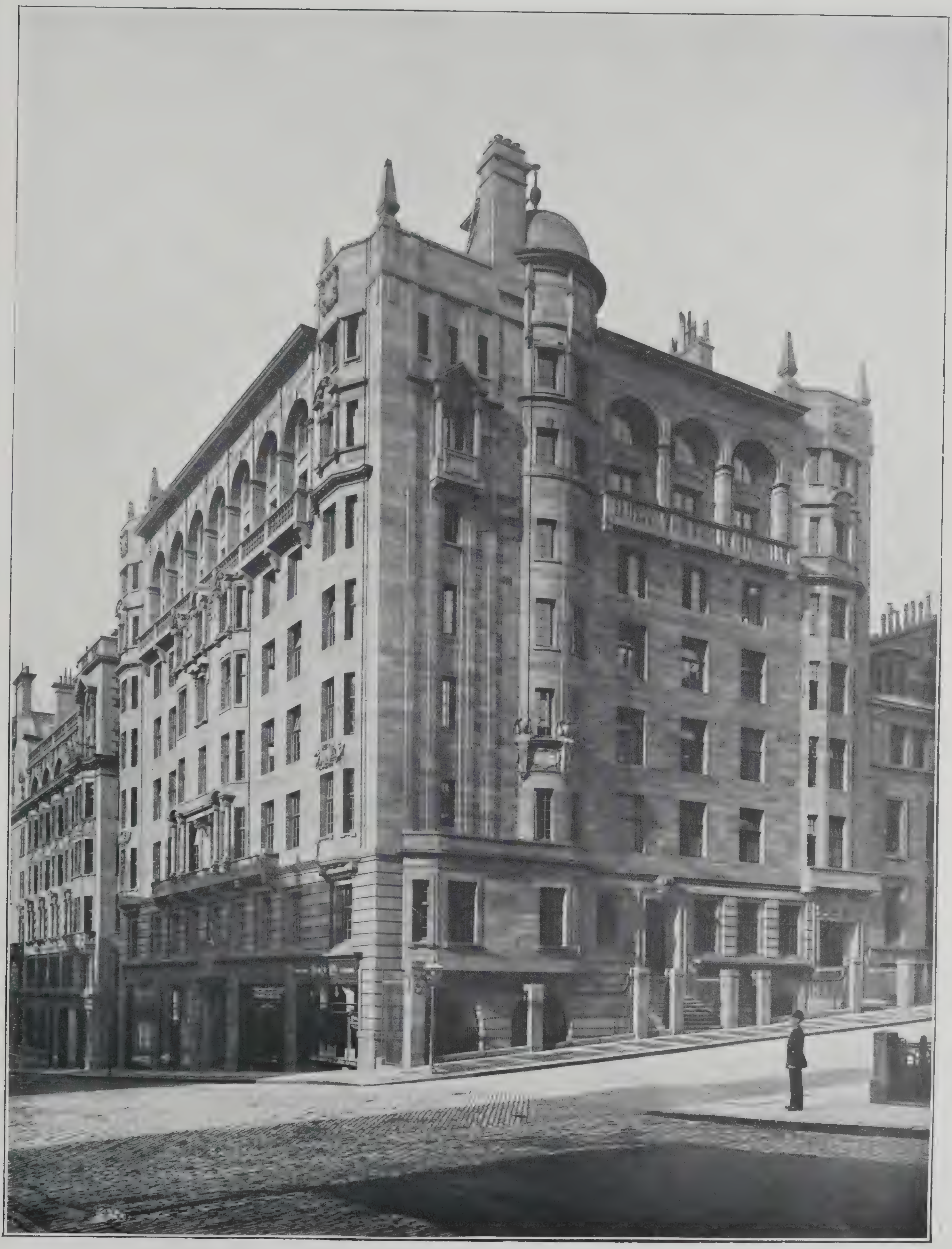
NEW GLASGOW DOORWAYS.

Supplement to
THE BUILDERS' JOURNAL AND ARCHITECTURAL ENGINEER,
Wednesday, November 28th, 1906.



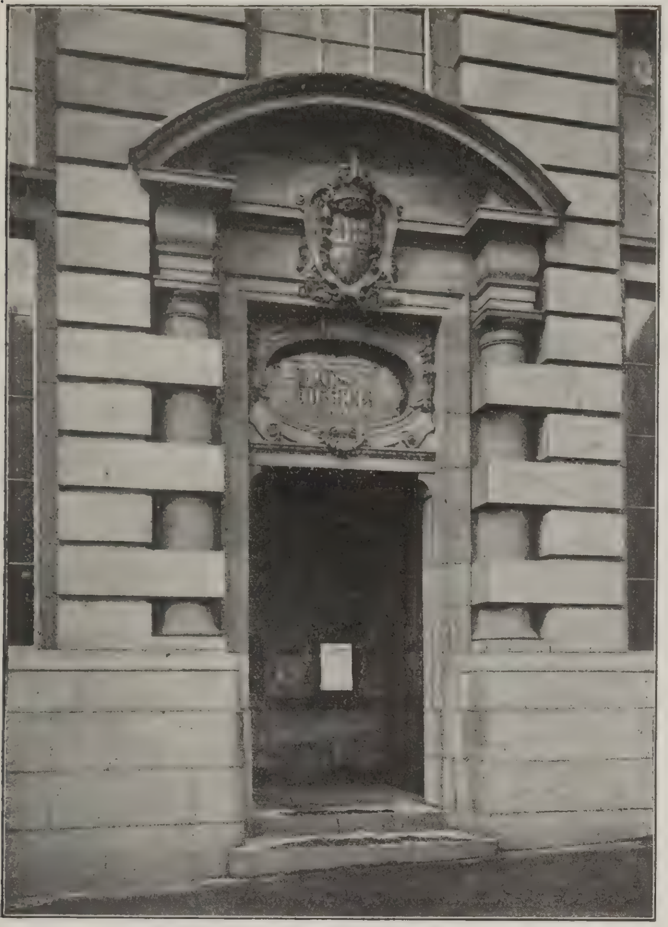
NEW WAREHOUSE, WEST CAMPBELL STREET AND CADOGAN STREET, GLASGOW.
JOHN BURNET AND SON ARCHITECTS

Supplement to
THE BUILDERS' JOURNAL AND ARCHITECTURAL ENGINEER,
Wednesday, November 28th, 1906.

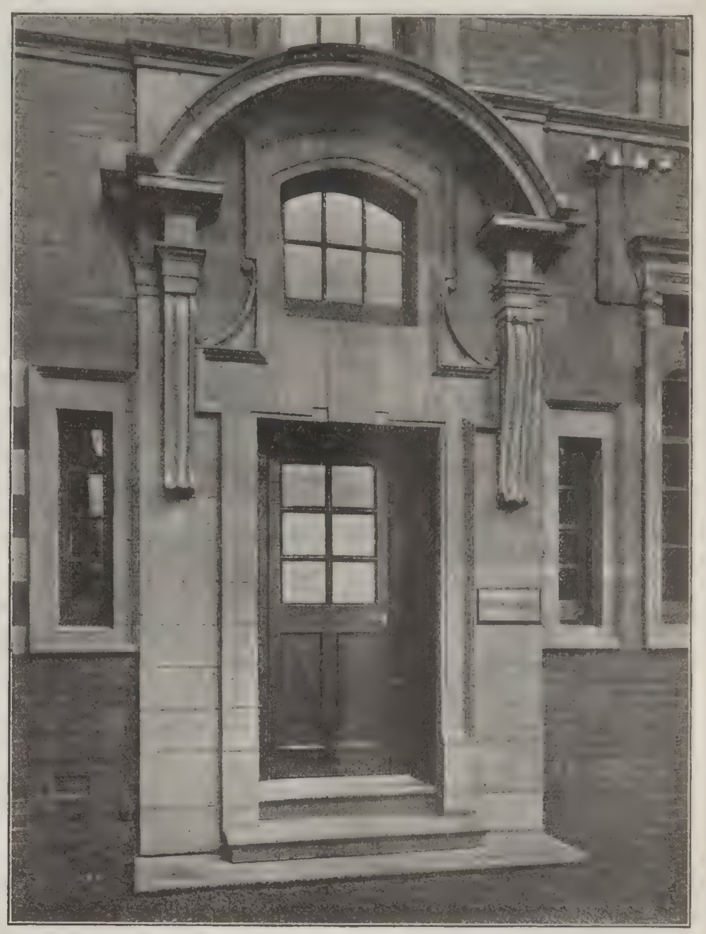


BUSINESS PREMISES, WEST GEORGE STREET AND HOPE STREET, GLASGOW.
JOHN A. CAMPBELL, F.R.I.B.A., I.A., ARCHITECT.

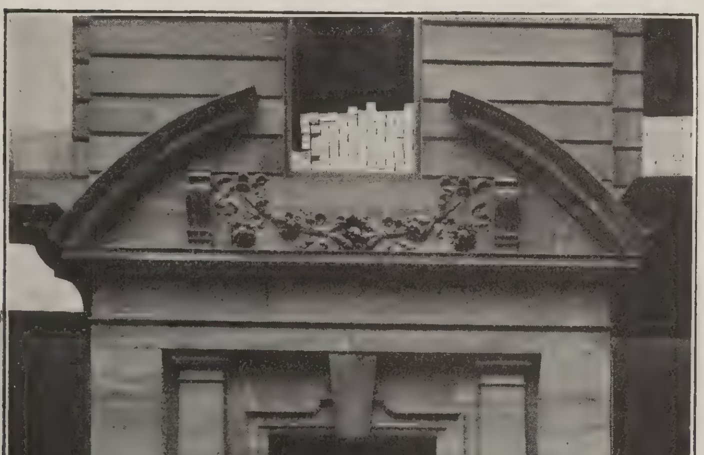
LIBRARY
OF THE
UNIVERSITY OF ILLINOIS



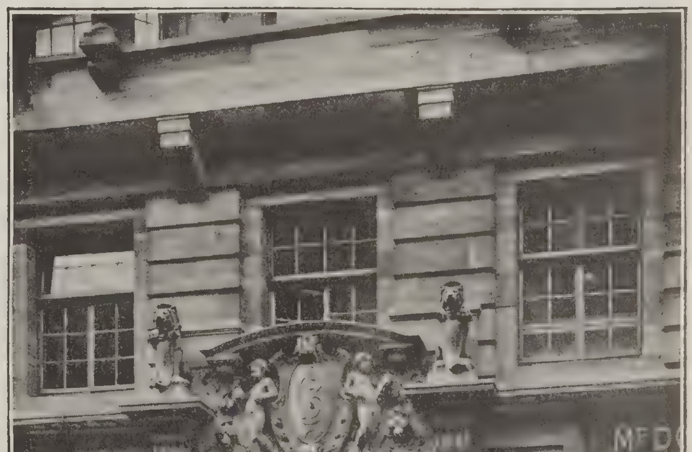
Branch Post Office, Wellington Street.
W. T. Oldrieve, H.M. Principal Architect for Scotland.



Office Building, Printing Works, Anniesland.
Alexander N. Paterson, M.A., A.R.I.B.A., Architect.



Business Premises, Albion Street. Thomson and Sandilands, Architects.



Business Premises, Hope Street. John A. Campbell, I.A., F.R.I.B.A. Architect

NEW GLASGOW DOORWAYS.

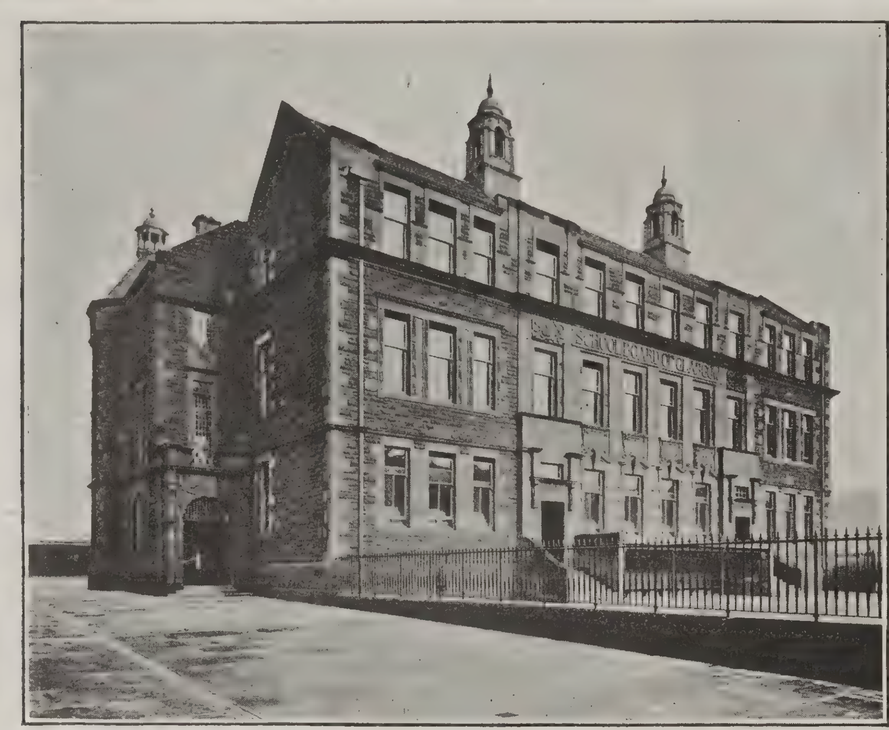
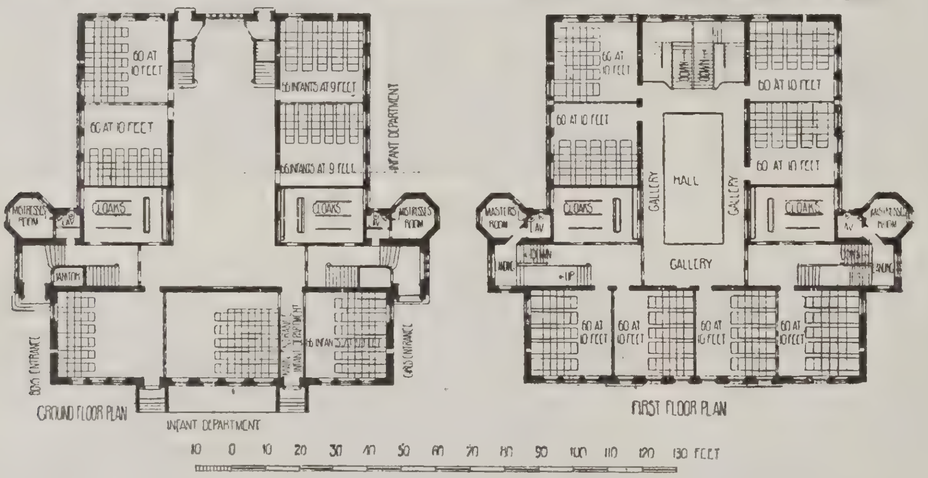


Photo: Lewis, Birmingham.



GOLFHILL PUBLIC SCHOOL, DENNISTOUN. ALEXANDER N. PATERSON, M.A., A.R.I.B.A., ARCHITECT.

Schools.

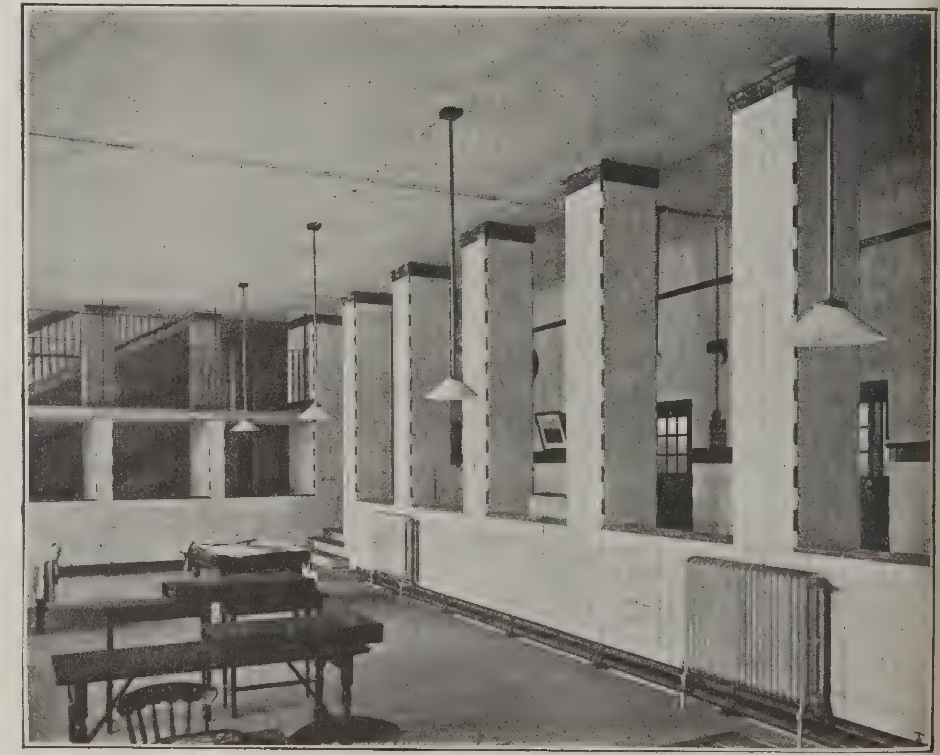
Within the five years with which we are now dealing many new schools have been erected in Glasgow. We do not propose, however, to attempt any complete list of them, as it would serve no useful purpose, but we show herewith four which may be taken as representative of the buildings provided. These are at Dennistoun, St. Rollox, Dalmuir, and in Scotland Street.

The Golfhill public school at Dennistoun is a mixed elementary school with accommodation for 1,500 children. After the arrangement common to most of the schools erected for the Glasgow Board, it has a large central hall rising through all the floors, with the classrooms grouped round it—in this case on the south-west and east sides only, so that the hall, in addition to the usual roof light, has a large five-light window at the north end. Boys' and girls' staircases are provided at the west and east ends respectively, and a wide double stair is placed at the north end of the hall, rising to the gallery on the first floor. The infants' department occupies the south and east portions of the ground floor. A house for the janitor is provided at one corner of the playground, and playing sheds and latrines for boys, girls and infants are placed along the north wall of the playground. The walls are constructed of Locharbriggs freestone from Dumfriesshire, and the roofs covered with Aberfoyle grey slates. The sliding partitions, screens, and internal finishings generally are of canary wood, the open-timbered roof to the central hall being of pitch-pine. The lower walls of hall, galleries and staircase, as well as lavatories and cloak-rooms, are lined with tiles. The total cost of the school was a little under £20,000, including about £1,000 spent in piling the ground to a depth of 40ft. under all the walls of the building, the site having been found to cover the centre of an old quarry filled up to that depth.

The following is the list of contractors (of Glasgow, except where otherwise stated):—

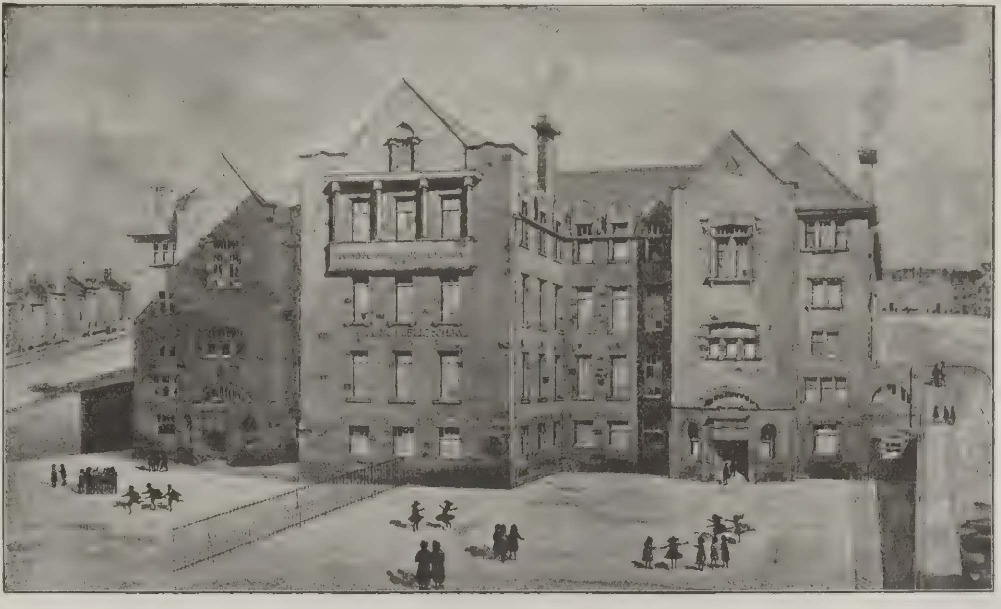
Mason work, James Parker; *iron and steel work*, Redpath, Brown & Co., Ltd.; *wright work*, A. Meiklejohn; *smith work*, McCallum & Hope; *plastering*, Joseph Graydon; *plumbing*, Fyfe & Allan, Ltd.; *tiling*, Haddow, Forbes & Co.; *glazing*, George G. Kirk; *cement pavior work*, William Forbes; *heating, &c.*, Hunter, McWilliam & Blair; *ventilation*, Cousland & Mackay; *slating*, W. & D. Mailer; *gasfittings*, H. Tosh, Sons & Cross; *stair railings*, John Craig; *patent roof glazing*, Henry Hope & Sons, Ltd., Birmingham; *wood block flooring*, Geary, Walker & Co., London; *Stott Thorpe lights*, James Stott & Co.; *ironmongery*, Fletcher, Parker & McAlpine.

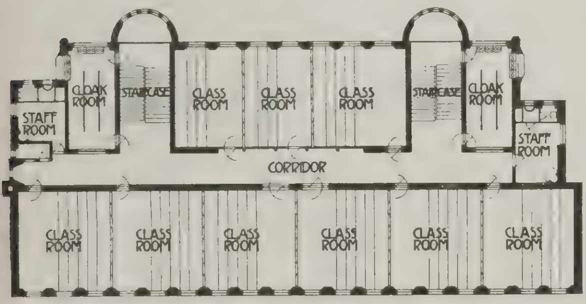
The St. Rollox public school, in a congested district of the city, is of the corridor plan, which, owing to the character of the site, gives a four-storey frontage to the north, in Garngad Road, and a three-storey one to the south. Three large playgrounds for boys, girls and infants are provided, each having ample shed and latrine accommodation. The school is 180ft. in length, and the corridor, which runs from end to end, is 10ft. wide, with seven classrooms opening off it on each floor, all facing the south and so arranged as to give left-side lighting. In the centre of the north elevation is a large projecting block, which provides a hall 50ft. by 40ft. on each floor. These halls are well lighted at the sides and ends, and are suitable for converting into classrooms,



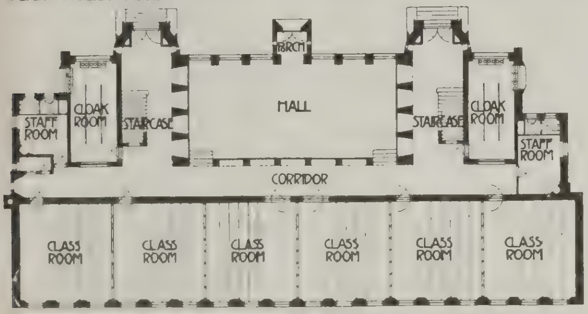
HALL, SCOTLAND STREET SCHOOL. HONEYMAN, KEPPIE AND MACKINTOSH, ARCHITECTS.

if desired. The hall on the top floor is finished with an open timber roof, while on the ground floor it is divided up for manual and laundry classes. The staircases are ample and well lighted, and cloakroom and lavatory accommodation for each sex opens off the main corridor. The staff rooms (with lavatory accommodation) are placed convenient to the entrances. The ventilation of the school is by draught-protecting screens arranged at the windows, the vitiated air being drawn off near the ceilings through ducts by two electric fans in a chamber in the roof, and discharged through louvred openings to the outside. Heating is by low-pressure hot-water piping and radiators. The design of the building is of simple Renaissance type, an unusual feature being that it is built with *polished* rubble and dressings throughout. A house for the janitor occupies a corner of the



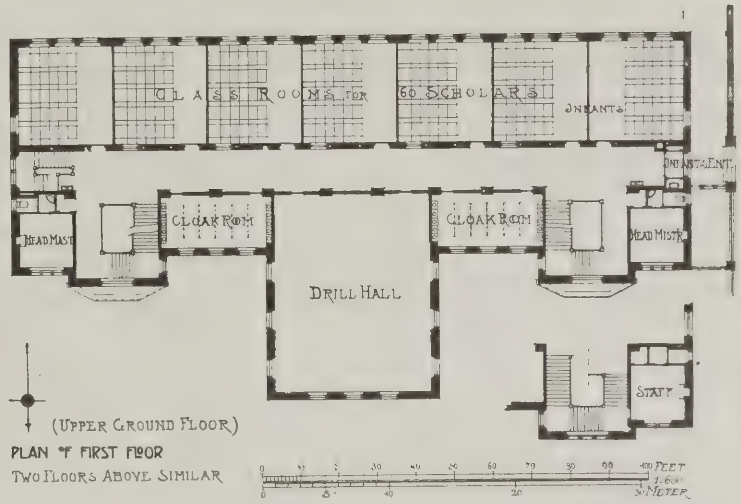


PLAN OF FIRST FLOOR

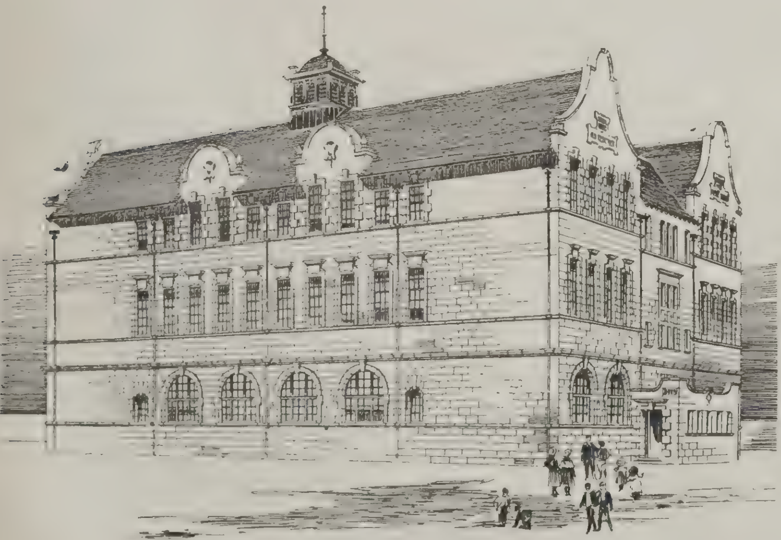


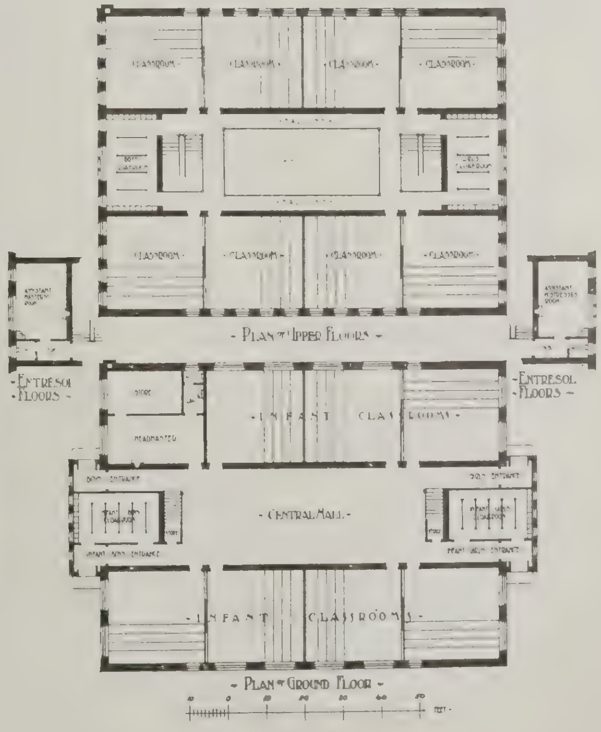
PLAN OF GROUND FLOOR

SCOTLAND STREET SCHOOL.

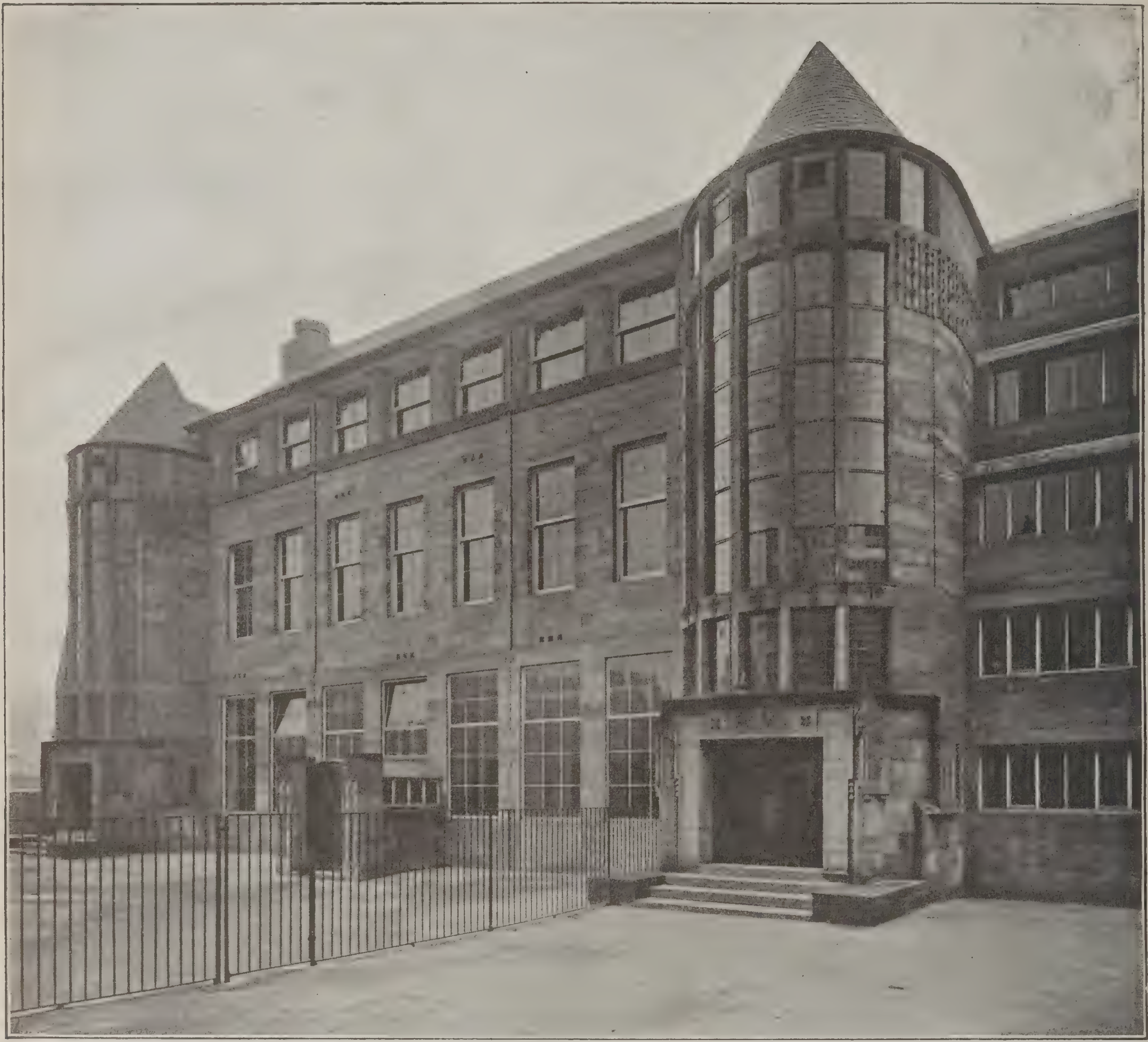


ST. ROLLOX PUBLIC SCHOOL. D. McNAUGHTAN, I.A., ARCHITECT.





PUBLIC SCHOOL, DALMUIR. D. ANDREW, Jr., ARCHITECT.



SCOTLAND STREET SCHOOL. HONEYMAN, KEPPIE AND MACKINTOSH, ARCHITECTS.

girls' playground. This school was built at a cost of £21,720, from plans prepared by Mr. Duncan McNaughtan, I.A., of Glasgow, the clerk of works having been Mr. David Johnstone.

The principal contractors were :—

Mason work, James Parker; *joiner work*, G. & D. Newton; *smith work*, P. & R. Fleming; *steelwork*, P. & R. Fleming; *cast-iron work*, Redpath, Brown & Co., Ltd.; *wood-block flooring*, Geary, Walker & Co., Ltd.; *stair railing*, John Craig; *ironmongery*, J. L. McIndoe & Co.; *glazing*, James Summers; *slating*, Hamilton & Co.; *painting*, James Moodie; *plumbing*, Robert Mason; *plastering*, Kenneth Mathieson; *tiling*, Haddow, Forbes & Co.; *concreting*, William Forbes; *heating*, Hunter McWilliam & Blair.

At Dalmuir an elementary school for children has been erected from designs by Mr. D. Andrew, junr., of Glasgow. The plans on the preceding page show its disposition, on the central hall system.

The school in Scotland Street, on the south side of the river, was completed about six weeks ago. The architects were Messrs. Honeyman, Keppie & Mackintosh, but it is clear that the last-named has controlled the design. We leave the accompanying illustrations to speak for themselves. The school is three storeys high, and has a frontage of 148ft. to Scotland Street. The main entrances for girls and for boys are placed at the right and left of this front, while for the infants there is a separate entrance in the centre. These entrances give access to two spacious staircases, and it is the glazed bays through which these are lighted which give such an unusual appearance to the front. Adjacent to the staircases are lavatories and cloakrooms. The school, it will be seen, is of the corridor type. On the ground floor there are 6 classrooms accommodating 390 pupils; on the first floor 9 classrooms, accommodating 500 pupils; and on the second floor 6 classrooms, accommodating 360 pupils; giving a total accommodation of 1,250. It will be noticed that of these 21 classrooms, 18 face south. On the ground floor a drill hall 58ft. by 25ft. is provided, with 3 classrooms above it on the first floor, and a cookery classroom in the same position on the second floor. In designing the school every effort has been made to arrive at a frank solution of the requirements, the finishings and fittings of the classrooms being of the simplest character, and glazed tiles used as a sanitary finishing to walls and piers. Heating is by low-pressure hot water, and ventilation effected by extract fans in the roof. A janitor's house and the usual children's offices and playsheds are provided within the playgrounds. The total cost of the building has been about £14,740. Mr. J. Montgomery was clerk of works.

The principal contractors were :—

Mason work, G. Barlas & Co.; *joiner work*, William Lightbody; *smith work and steel and iron work*, P. & R. Fleming, Ltd.; *slating*, Hamilton & Co.; *painting*, C. Carlton & Sons; *plumbing*, J. L. Arnot; *plastering*, MacIntyre & Jolly; *glazing*, R. L. Paterson; *paving*, John Forbes; *ironmongery*, McGeoch & Co.; *tiling*, British Art Tileries Co.; *heating and ventilating*, J. Combe & Son; *tar macadamising*, W. G. Walker & Sons; *electric lighting*, J. D. MacKenzie & Co.

Libraries.

The system of public libraries administered by the Glasgow Corporation, under the provisions of a local Act of Parliament, is intended to consist of (1) The Mitchell Library, (2) a series of sixteen district libraries, and (3) two district reading-rooms. Of these there are now open the Mitchell Library, twelve district libraries, and one district reading-room. Buildings for two more district libraries are approaching completion. For the two remaining district libraries sites have not yet been secured. The Mitchell Library (founded in 1874 with a bequest of about £67,000 by the late Mr. Stephen Mitchell, tobacco manufacturer, Glasgow) was opened in temporary premises in 1877 with 14,000 volumes; in 1890-91, when it had increased to more than 80,000 volumes, it was removed to the building in Miller Street it now occupies. The development of the library has been continuous and steady, the number of volumes now contained in it being more than 170,000, and the present building in Miller Street has long been inadequate both for the stock of books and for the accommodation of readers. The Corporation decided therefore to erect a new building on the vacant ground between the St. Andrew's Halls and North Street, the principal elevation being in the latter thoroughfare. The architect is Mr. Wm. B. Whitie, I.A., of Glasgow, whose design was selected from a large number submitted in open competition. The plan on the next page shows the general disposition of the building. The contracts for the erection of the library are now under consideration, and it is expected that building operations will be commenced very shortly.

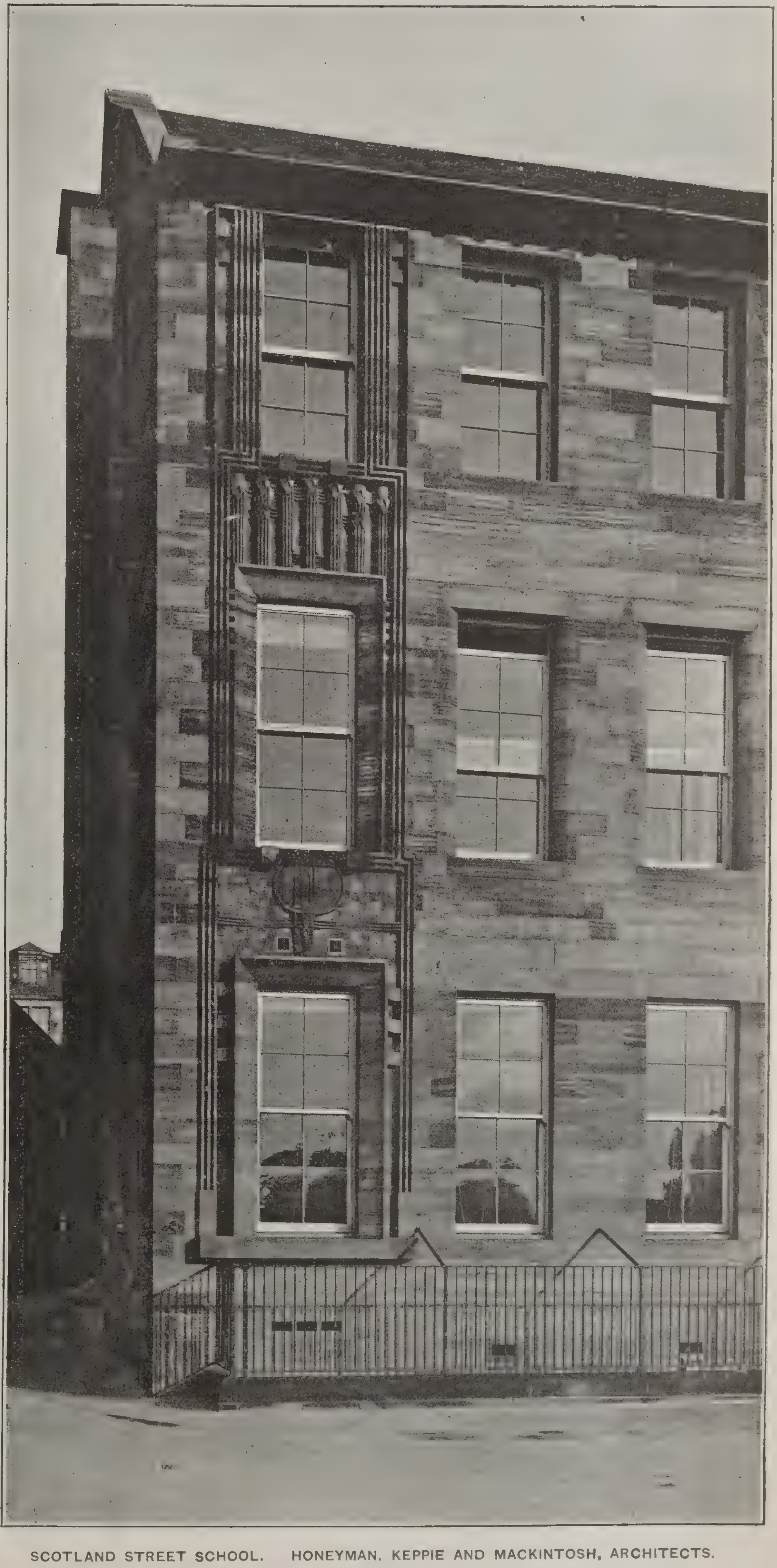
With regard to the district libraries, we may mention that those now open are at Gorbals, Kingston, Anderston, Woodside, Maryhill, Springburn, Dennistoun, Govanhall, Bridgeton, Parkhead, Hutchesontown and Kinning Park, while those at Pollokshields and Townhead are well advanced towards completion. Each district library has a lending department containing from 7,000 to 13,000 volumes, a large general reading-room, and reading-rooms for ladies, for boys, and for girls, together with the necessary staff and store accommodation. We give on the next page illustrations of the libraries at Woodside, Anderston, Maryhill, Crosshill and Hutchesontown.

(For the foregoing particulars we are indebted to the courtesy of Mr. F. T. Barrett, the City Librarian, who was responsible for the excellent scheme of branch libraries outlined above. The carrying out of this scheme has been largely aided by the gift of £100,000 which Mr. Carnegie made to the Corporation about five years ago.)

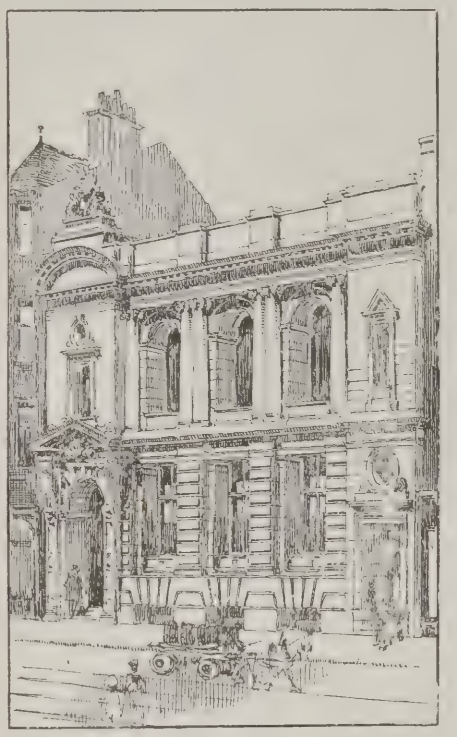
Domestic and Church Work.

A good many houses of much interest have been erected in the suburbs of Glasgow within recent years, by such architects as Mr. J. J. Burnet, Mr. James Miller, Mr. John A. Campbell, Mr. H. E. Clifford, Mr. Sydney Mitchell, &c., but we regret we have not space to deal with them now. Of church work not a great deal of importance has been done, but we may mention a new church at Dennistoun by Mr. P. Macgregor Chalmers, and the addition to the Catholic Apostolic Church, in Catherine Street, by Messrs. Salmon and Son and Gillespie.

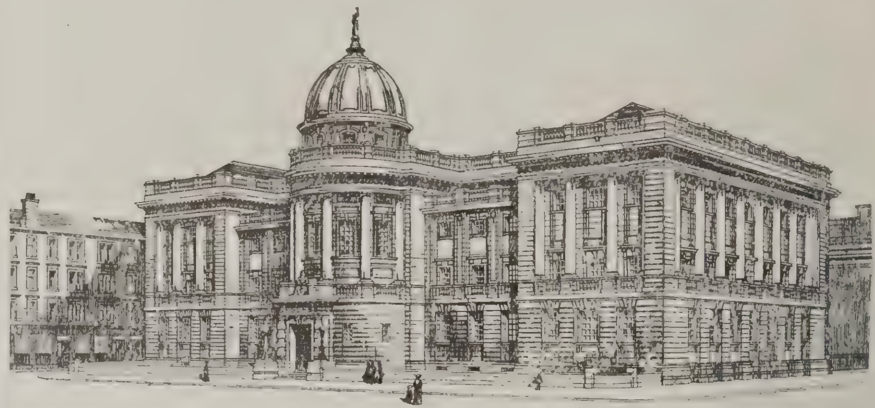
Between Kilbowie and Dalmuir a very extensive scheme of artisans' dwellings is being carried out by Messrs. Robert McAlpine & Sons—intended to provide accommodation for about 20,000 people. Hundreds of houses have been erected, and it is noteworthy that they have not been built in the usual huddled fashion, but on a generous plan with good air-space and greenery around them.

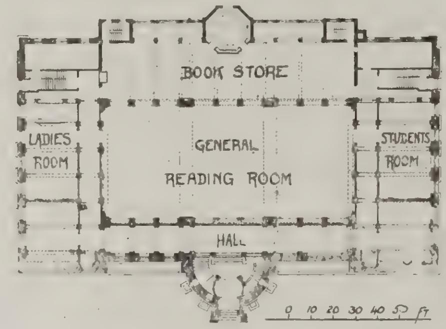


SCOTLAND STREET SCHOOL. HONEYMAN, KEPPIE AND MACKINTOSH, ARCHITECTS.

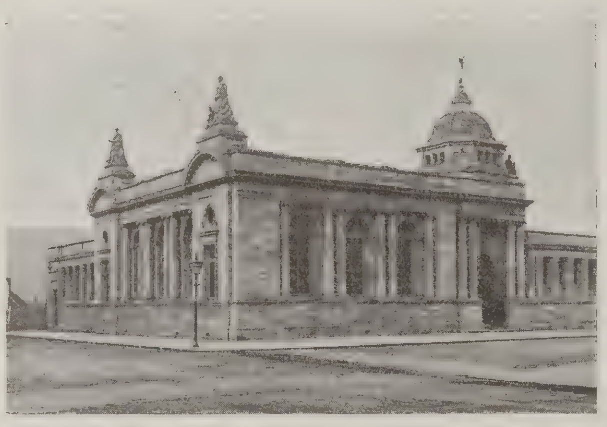


Maryhill District Library. James R. Rhind, Architect.

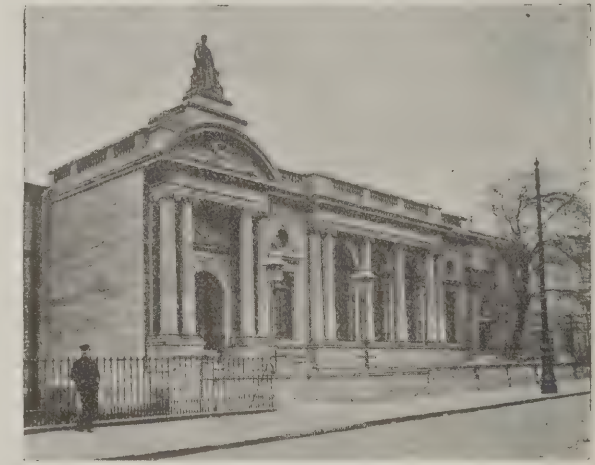




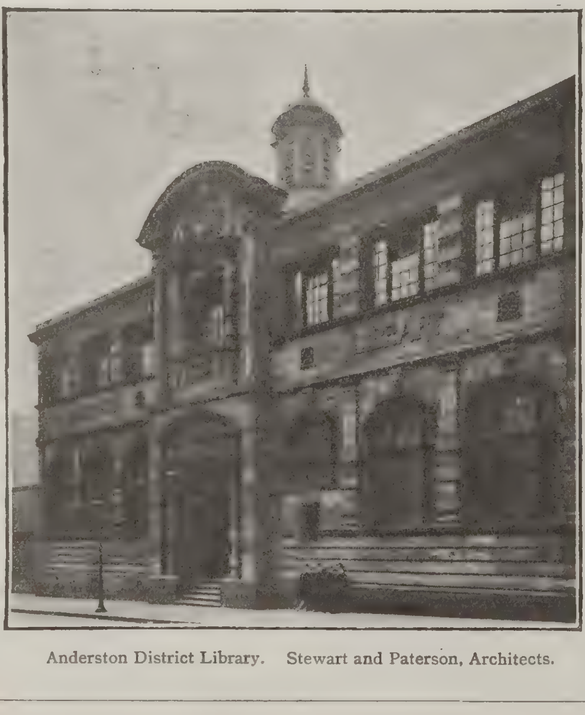
The New Mitchell Library, North Street.
William B. Whitie, I.A., Architect.



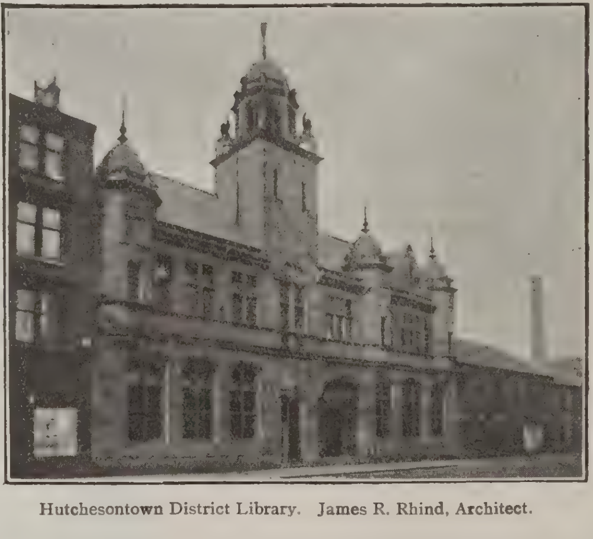
Crosshill and Govanhill District Library. James R. Rhind, Architect.



Woodside District Library. James R. Rhind, Architect.

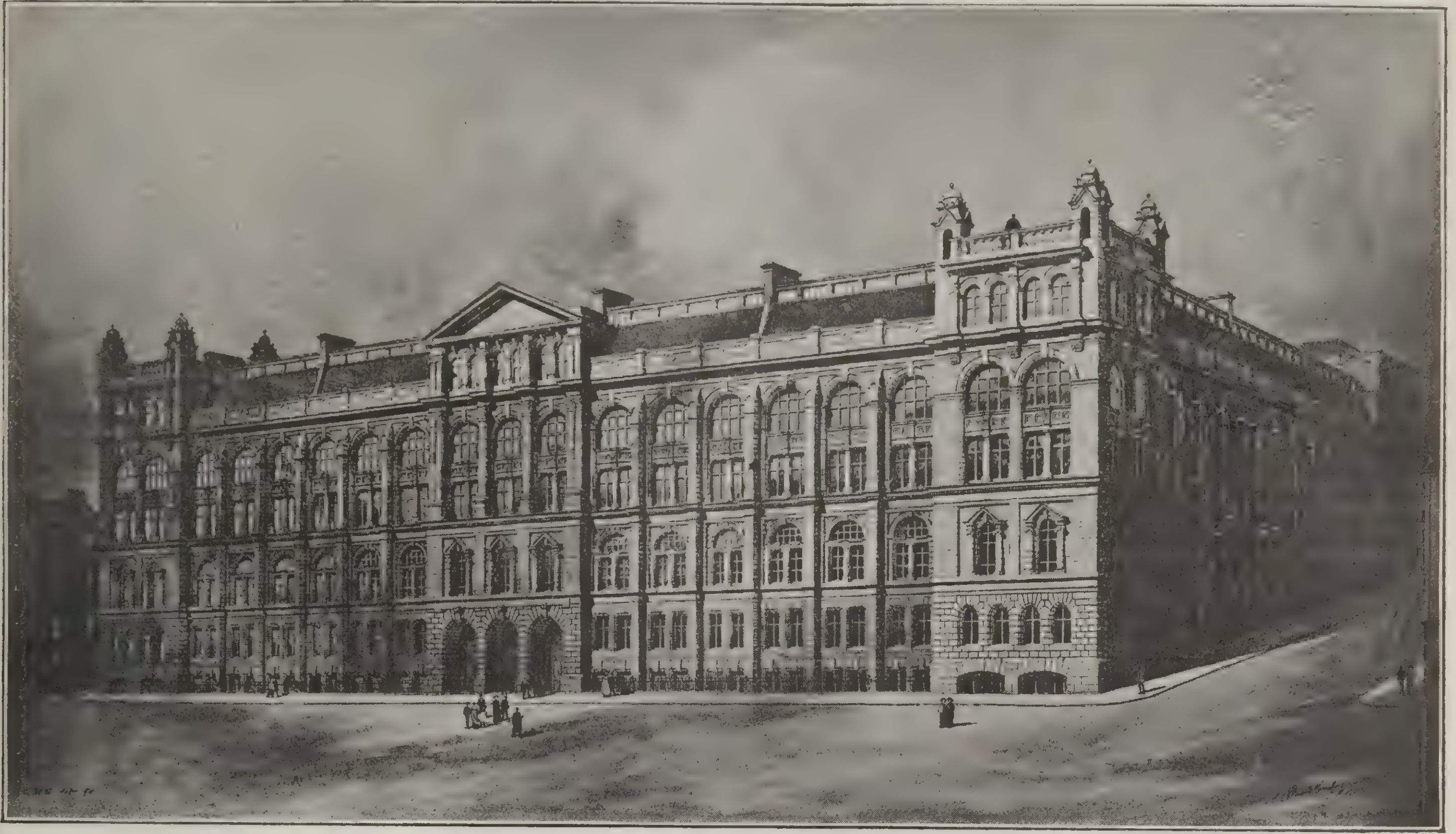


Anderston District Library. Stewart and Paterson, Architects.



Hutchesontown District Library. James R. Rhind, Architect.

NEW GLASGOW LIBRARIES.



GLASGOW TECHNICAL COLLEGE, GEORGE STREET. DAVID BARCLAY, F.R.I.B.A. ARCHITECT.

Glasgow Technical College.

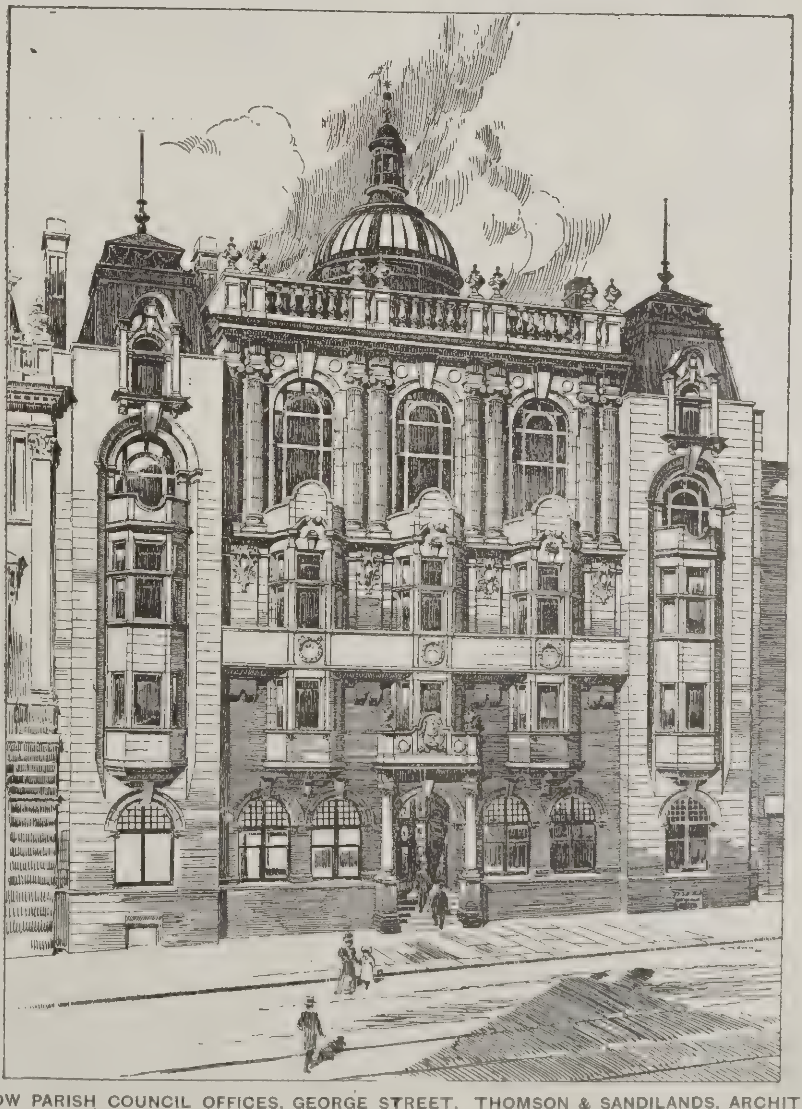
The work of erecting this large new building has been in progress for four years, and at the present moment the five large wings of the college (comprising more than five acres of floor space) have been completed, two parallel to George Street and three at right angles, parallel to Montrose Street. The main front, however, shown in the illustration above, has still to be added. It will be 346ft. long and more than 100ft. high, comprising five floors and a semi-basement. The walls facing the streets are of red Dumfriesshire stone, while all other exterior walls are of white enamelled brick to secure the greatest amount of light to the rooms facing the five interior courts. When complete the building will be among the largest of its kind in the Kingdom. The total cost is likely to be about £300,000. Mr. David Barclay, of Glasgow, is the architect.

The principal contractors are:—

Mason work, P. & W. Anderson; *joiner work*, George Ferguson & Sons; *plumbing*, Ingleton & Co.; *plastering*, McGilvray & Ferris; *painting*, R. & J. Bennet.

Parish Council Offices.

The desirability of unifying the several parish councils of Glasgow having been recognised, it was decided to provide a central building in George Street, for which work Messrs. Thomson & Sandilands were appointed architects. The ground floor of the building is mainly occupied by the entrance hall (with staircase centrally placed), collector's office, and a large hall at the rear, the first floor being apportioned to various departmental rooms. The council chamber is on the top floor. It is expressed on the exterior by the three large windows with coupled columns between, and is crowned by a dome. A view of the main doorway is given on page 264.



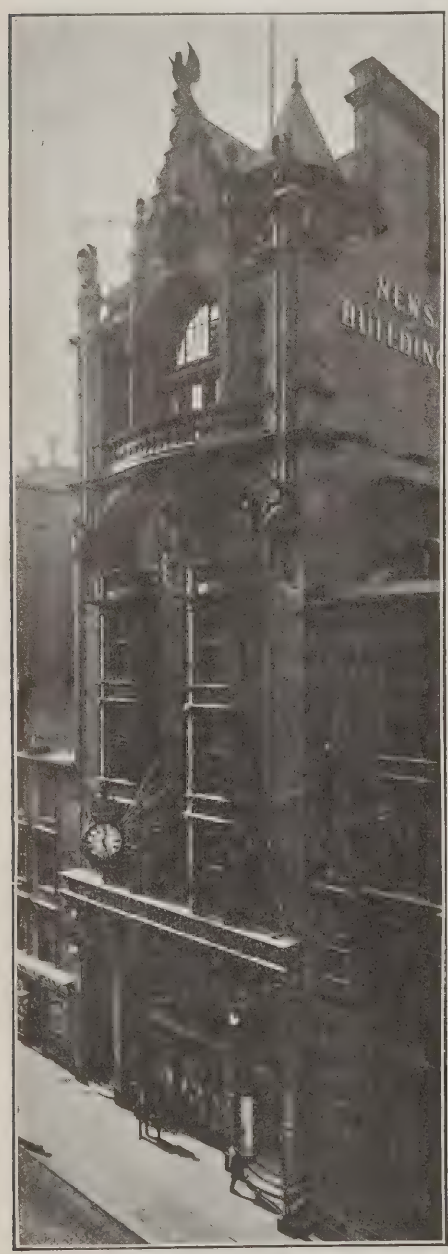
GLASGOW PARISH COUNCIL OFFICES, GEORGE STREET. THOMSON & SANDILANDS, ARCHITECTS.

Office Buildings and Business Premises.

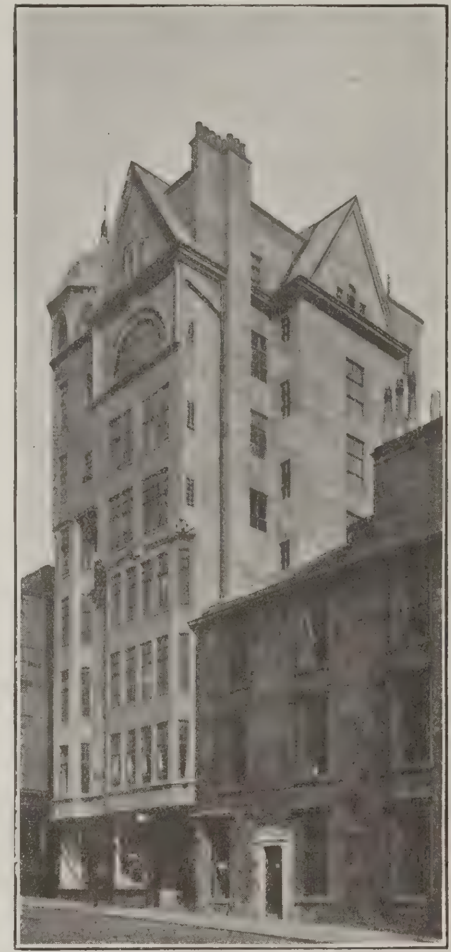
At the corner of West George Street and Hope Street a huge building has been erected from designs by Mr. John A. Campbell. We give a view of it as a centre plate in this issue. The building is carried out in red sandstone. The windows are treated without any sort of moulding, and what embellishment there is on the building is severe and sparse; nevertheless, the effect is not gaunt but impressive, and, we think, very successful. Among the contractors for this large building were the following:—

Mason work, Morrison & Mason, Ltd., Glasgow; *steelwork and fire-resisting floors*, D. Ferguson & Co., Carlisle; *plastering*, George Rome & Co., Glasgow; *electric passenger lifts*, Easton & Co., Ltd., London; *grates*, Well Fire Co., Ltd., Glasgow.

Further up Hope Street is a very high office building built of reinforced concrete on the Hennebique system. The site is only 46ft. by 33ft., while the height of the building is 90ft. from the pavement, and 100ft. from basement level. This great restriction of site-area created many difficulties in carrying out the work, but by ingenious construction they were all overcome satisfactorily. The architects, Messrs. Salmon and Son & Gillespie, have treated the design in conformity with the nature of the material, no effort being made to imitate stone or brick, and we think they have achieved a considerable success. The outer walls and floors are 4ins. thick only—a significant fact: for, if the thickness prescribed by the Building Act had been enforced, the rooms would have been too small for useful occupation. The ground and basement floors are occupied by a firm of stationers and printers, the upper floors being tenanted chiefly by lawyers, and the top floors by artist painters. Lawyers being largely in evidence within the building, we find a reason for the two modelled corbels, representing legal dignitaries, which help to support the main oriel window.



"GLASGOW EVENING NEWS" OFFICE, HOPE STREET. ROBERT THOMPSON, ARCHITECT.



REINFORCED CONCRETE OFFICE BUILDING, HOPE STREET. SALMON AND SON AND GILLESPIE, ARCHITECTS.

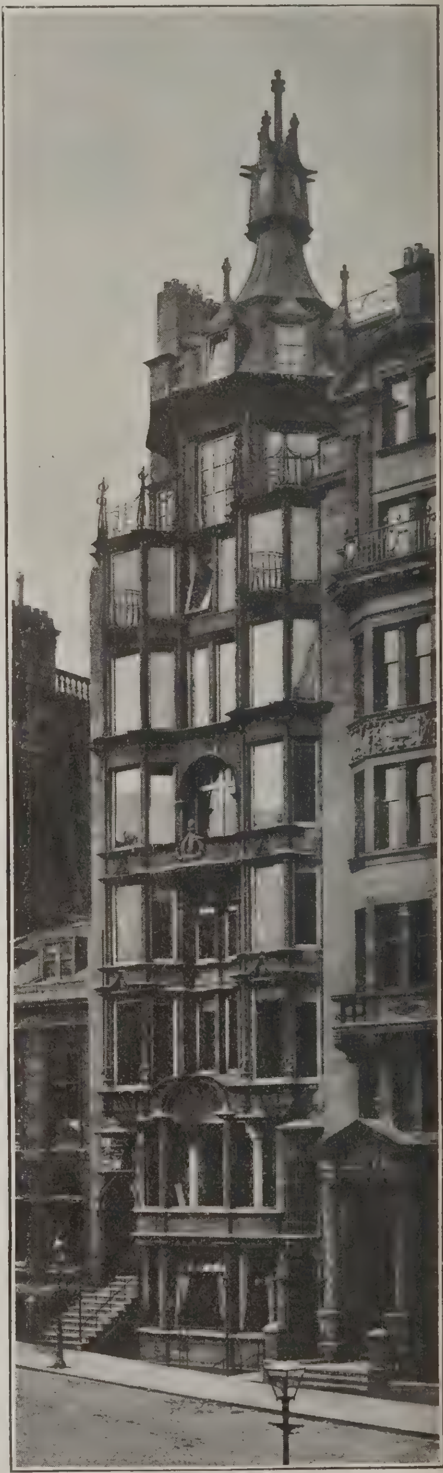
Among the contractors for this building were the following:—

Reinforced concrete work, Yorkshire Hennebique Constructing Co., Ltd., Leeds; *fire-resisting partitions*, Stuart's Granolithic Stone Co., Glasgow; *bitumastic enamel on roof*, Wailes, Dove & Co., Newcastle-on-Tyne; *electric elevator and enclosures*, A. & P. Steven, Glasgow; *grates*, Well Fire Co., Ltd., Glasgow; *stoves*, Carron Co., Carron.

In Hope Street new premises have been erected for the "Glasgow Evening News" from designs by Mr. Robert Thompson.

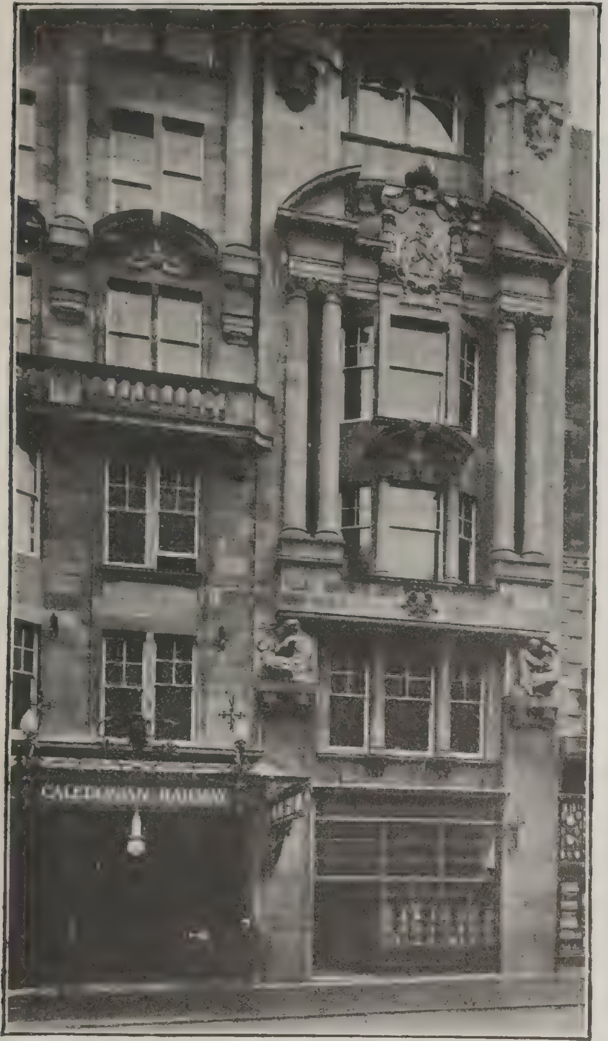
At 144, St. Vincent Street is a very high and narrow block of offices by Messrs. Salmon and Son & Gillespie. A very large amount of window space was required. The accompanying illustration shows how this has been provided.

A large block has been erected with frontages of 130ft. each to Mitchell Street, Mitchell Lane and Gordon Lane. The building is eight storeys high, including basement, and has four entrances, with four passenger and goods lifts. The roof is flat, and all staircases are taken up to it, communicating with one another so that any staircase can be used as an exit in case of fire. The basement is occupied as a billiard saloon and for wholesale stores. The ground floor is let as motor-car showrooms, with licensed premises at the corner of Gordon Lane, and the upper floors are let as offices in the front buildings and as warehouses at the back. Messrs. Frank Burnet, Boston and Carruthers, of Glasgow, were the architects.



[*Photo: Lewis, Birmingham.*

OFFICE BUILDINGS, 144, ST. VINCENT EETSTR. SALMON & SON AND GILLESPIE, ARCHITECTS.



PORTION OF "CALEDONIAN CHAMBERS," UNION STREET.
JAMES MILLER, A.R.S.A., F.R.I.B.A., ARCHITECT.

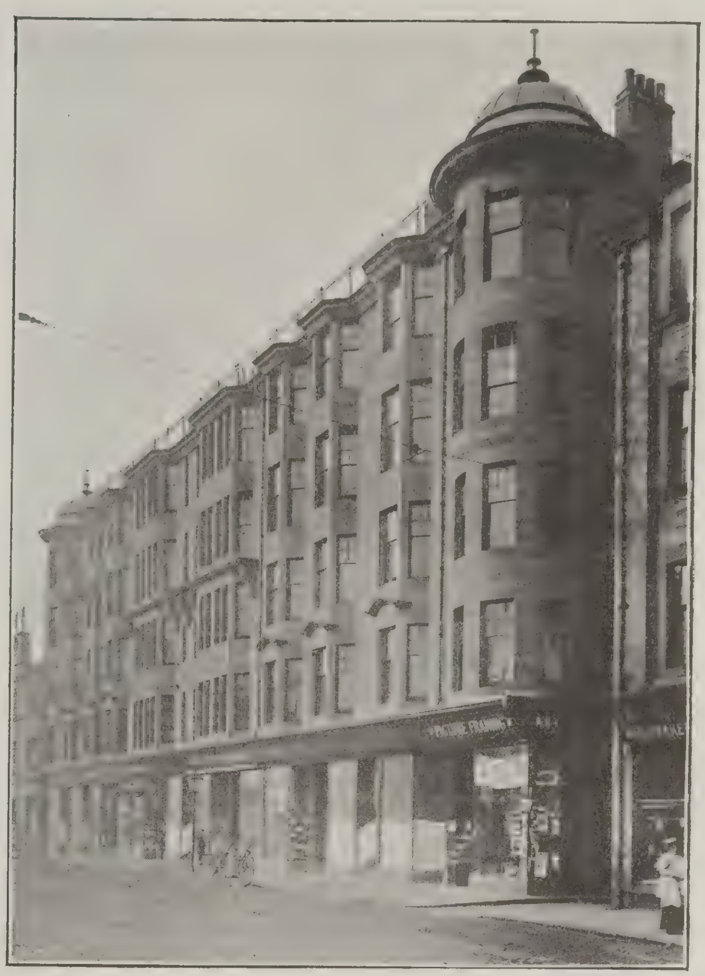


Photo : Annan

SHOPS AND FLATS, POLLOKSHAWS ROAD. JOHN NISBET, ARCHITECT.

Large halls have been built for the Co-operative Society on the south side of Glasgow, by Messrs. Bruce and Hay.

New headquarters for the 4th Battalion Royal Scottish Rifles have been erected in Taylor Street at a cost of about £5,000. The architects were Messrs. John McKissack & Son.

At Anniesland, on the western side of Glasgow, are new printing works and offices for Messrs. Robert McLehose & Co., Ltd. Mr. Alexander N. Paterson, of Glasgow, was the architect. A view of the entrance doorway to the office block is given on page 265.

In Pollokshaws Road, overlooking Camphill Park, a five-storey block of flats with roof garden has been erected from designs by Mr. John Nisbet, of Glasgow. The building is of fire-resisting materials throughout, all floors and roofs having been constructed by the Albion Fireproof Construction Co. This building is the first of its kind to be erected in Glasgow.

Caledonian Chambers, Union Street.

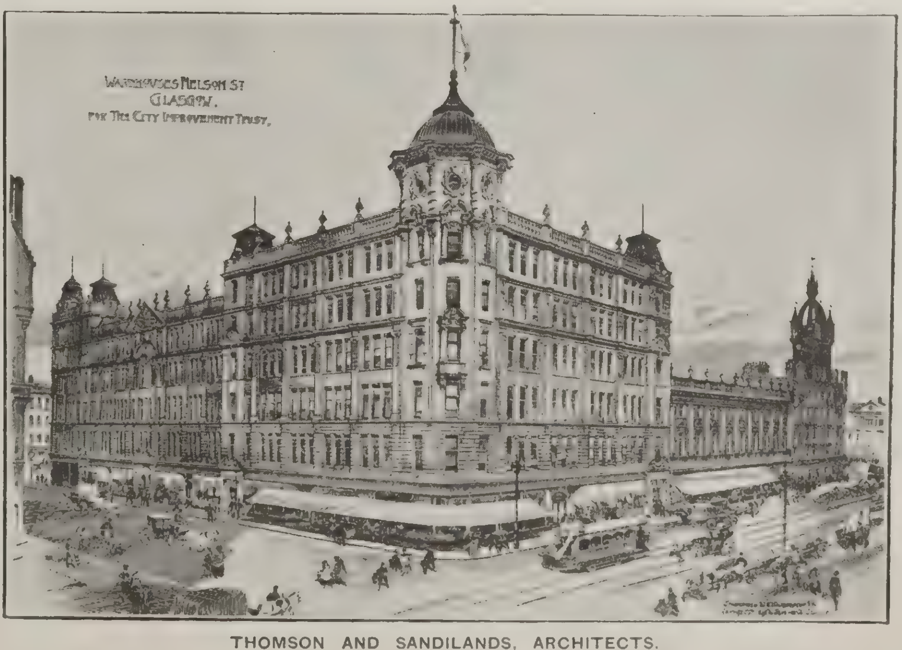
In Union Street a large block of shops and offices has been erected from designs by Mr. James Miller. The frontage is 184ft., and as the building is a high one and carried out in white freestone it is a very prominent addition to the thoroughfare. A balcony stretches across the front at third-floor level, and above, between the windows, a series of columns rises to the cornice. At either end of the building is a large broken pediment, supported on coupled columns carried by figures below acting as corbels. Two bay windows are arranged between the coupled columns, and over them is a shield with the Royal arms of Scotland thereon. At the northern end is an entrance to the Caledonian Railway station, with tea-room adjoining.

The contractors were Messrs. P. & W. Anderson, the principal sub-contractors being as follows (of Glasgow, except where otherwise stated) :—

Joiner work, John Cochrane; *plumbing*, Wm. Anderson; *plastering*, McGilvray & Ferris; *painting*, John Orr & Sons; *heating and ventilating*, Ashwell & Nesbit, Ltd., Leicester.

At the corner of Albion Street and Nelson Street a large block of shop premises has been erected from designs by Messrs. Thomson & Sandilands. This forms part of an improvement scheme, Nelson Street having been widened at this point from 25ft. to 50ft. and straightened. On the Albion Street front there are two good doorways. A photograph of one of them is given on page 265.

In Sauchiehall Street a new building has been erected for Mr. James Simpson. It


WAREHOUSES NELSON ST
GLASGOW.
FOR THE CITY IMPROVEMENT TRUST.

THOMSON AND SANDILANDS, ARCHITECTS.

is used as a furniture warehouse. There are two electric lifts within the building, the back one being for goods, and the passenger lift in the well of the main staircase. The building is built of Corrie stone from the Island of Arran. Messrs. Honeyman, Keppie & Mackintosh, of Glasgow, were the architects.

At the corner of George Square and Queen Street is a very large office block, with shops on the ground floor. The building is of white freestone, and by reason of its size and prominent position at once attracts attention. The main front is to Queen Street, and this is very successful, the entrance doorway, carried up to the second floor, forming a dignified feature. At fourth-floor level a balcony extends across the front, with a range of columns above, crowned by a heavy cornice. On the George Square front a similar treatment is followed, but the two arched openings at the top of the building, with railings across them, are unfortunate (see page 261). It would have been a great improvement if these openings had been omitted and the top cornice of the building kept to the same level as in Queen Street. The building has a flat roof, and is of fire-resisting construction throughout, the floors being subdivided by light fire-resisting partitions.

The following is the list of contractors (of Glasgow, except where otherwise stated) :—

Mason work, Thaw & Campbell; *steelwork*, P. & W. MacLellan, Ltd.; *joiner work*, John Baxter & Sons; *plumbing*, Wm. Anderson; *plastering*, D. & J. MacKenzie; *painting*, C. Carlton & Sons; *glazing*, C. & J. Malloch; *tiling*, Haddow, Forbes & Co.; *electric lighting*, Matthew Clerk & Co.; *heating and ventilating*, James Boyd & Sons, Paisley.

Anchor Line Building.

In St. Vincent Place, opposite the Scottish Provident Institution building, a large new block of offices for the Anchor Line Steamship Co. is in course of erection. At the present moment the work is at first-floor level. The particular interest of this building lies in the fact that the front and sides are to be faced with Doulton's "Carrara" ware. This is the first instance of the use of such material in Glasgow. It has already been pointed out how severely the Glasgow atmosphere attacks stonework; hence a material like Carrara seems admirably adapted to buildings in this city, as it can be treated architecturally and its glazed surface can be cleaned down with water periodically, as done, for example, at the Savoy Hotel extension in London. This new building of the Anchor Line Steamship Co. is to be seven storeys high. The ground floor and basement will be devoted to large booking offices in connection with passenger and freight departments; the first floor will be occupied by offices and private rooms of the company; while the floors above will be let as general offices. Mr. James Miller is the architect.

The principal contractors (all of Glasgow) are :—

Mason work, Thaw & Campbell; *steelwork*, P. & W. MacLellan; *joiner work*, G. Ferguson & Sons; *plumbing*, Wallace & Connell; *plastering*, McGilvray & Ferris; *glazing*, C. & J. Malloch; *tiling*, Galbraith & Winton.

New Buildings at the University.

To Sir Gilbert Scott's main block of Glasgow University many additions have been made at one time and another. Mr. John Oldrid Scott, F.S.A., with Mr. J. J. Burnet, are responsible for new engineering and anatomical laboratories to the east, and Mr. J. J. Burnet for the surgical laboratory and for the temporary accommodation for the chemical department immediately to the south of these. Mr. James Miller is the architect of the buildings now in course of completion to the west. One of the new buildings contains departments of psychology, materia medica, forensic medicine and public health, while the other contains the natural philosophy department. The cost of these new buildings is likely to amount to £100,000, including fittings and equipment.

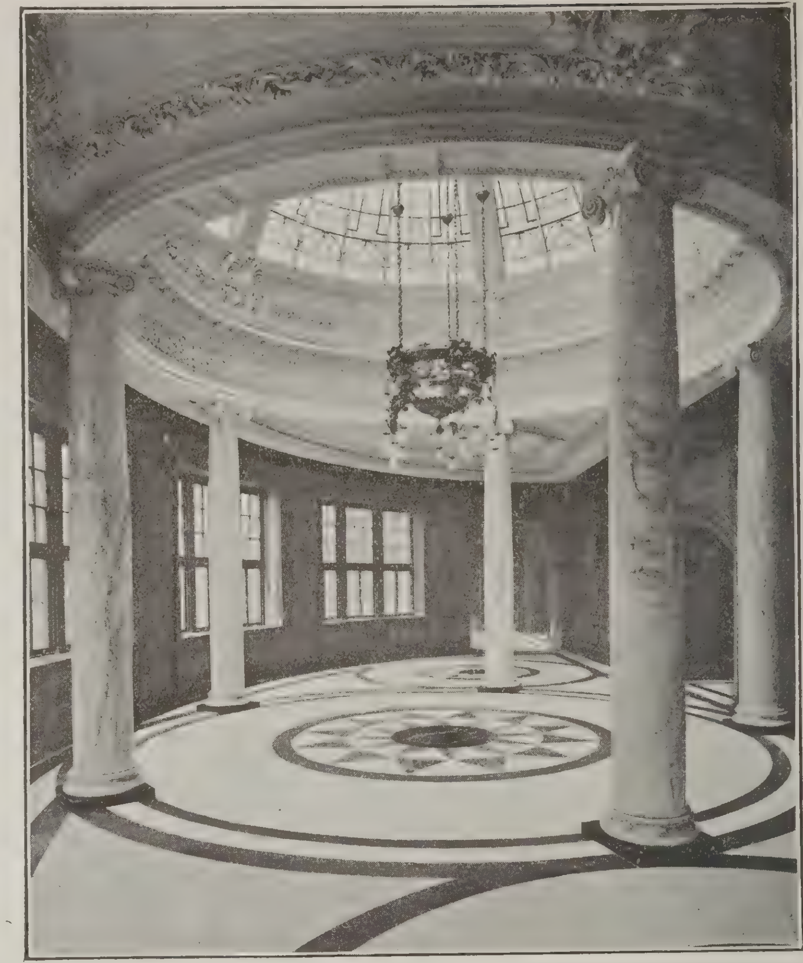


Photo: *Bedford Lemere & Co.*

CENTRAL STATION HOTEL EXTENSION: THE LOUNGE.
JAMES MILLER, A.R.S.A., F.R.I.B.A., ARCHITECT.

Central Station Hotel Extension

At the Central Station Hotel a large extension is being completed, providing a dining-room 100ft. by 50ft. by 30ft. high, with subsidiary dining-room, lounge, and billiard-room, together with about 130 bedrooms and sitting-rooms (the bedrooms being arranged with bathrooms *en suite*). The large new dining-room is not yet finished, but it promises to be a very fine apartment, with its richly-modelled plaster ceiling, marble columns, and walnut panelling 14ft. high. The lounge is most conveniently arranged, and the device of a domed light carried on marble columns, with a handsome electrolier in the centre, is well conceived. On the exterior to Hope Street the new work adds 150ft. to the frontage, and is in conformity with the main building, which was designed by Sir Rowand Anderson. The new frontage is carried out in white freestone from Giffnock quarries. Mr. James Miller is the architect.

The contractors are Messrs. P. & W. Anderson, the sub-contractors being as follows (of Glasgow, except where otherwise stated) :—

Joiner work, John Cochrane; *plumbing*, Wm. Anderson; *plastering*, McGilvray & Ferris; *painting*, Charles Carlton & Son; "*Atmospheric*" *heating and ventilating*, Ashwell & Nesbit, Ltd., Leicester; *electric fittings*, J. W. Singer & Sons, Frome; *dining-room finishings*, Wylie & Lochhead; *wood carving*, H. H. Martyn & Co., Cheltenham; *lounge and billiard-room ceiling*, Bromsgrove Guild, Bromsgrove; *dining-room ceiling*, George Jackson & Sons, London.

While referring to the extensions at the Central Station Hotel, it is opportune to mention the great enlargement being made to the station itself. The generous circulating space at this terminus of the West Coast Route (which provides such a splendid service of dining-car and sleeping saloon expresses between Euston and Glasgow, bringing the northern city within eight hours of London) is notable. Indeed, this terminus is excellently appointed throughout, not the least in respect of its underground lavatory. This is probably the largest of its kind in the Kingdom. It extends from the east side to the west side of the station, and is carried out in the best possible manner, there being, in addition to the usual conveniences, a long range of basins fitted with hot and cold water, as well as bathrooms and hairdressing and bootblacking rooms. For the sanitary fittings Messrs. Doulton & Co., Ltd., Messrs. Shanks & Co., Ltd., and Messrs. Twyfords, Ltd., were responsible, their work being a model of excellence; while the ventilation and heating was efficiently carried out by Messrs. James Boyd & Sons, of Paisley.

Correspondence.

Cutting Moulds for Flat Arch.

To the Editor of THE BUILDERS' JOURNAL.

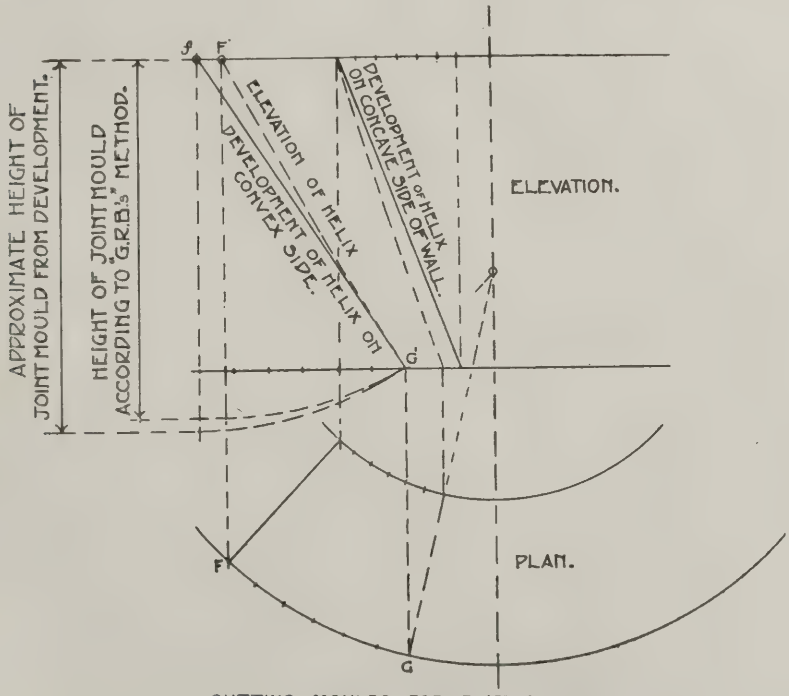
SIR,—While thanking "G. R. B." for his reply to my letter on the above, I maintain that the method he shows for the projection of the joint moulds is entirely wrong. He says in his letter that the height of the joint mould, No. 2, Fig. 4, is equal to the length of the line F′ G′ in the elevation, and that I am not correct in stating that the height of this joint mould should be equal to the length of the line *fg.*, Fig. 3. Now, the dotted line F′ G′, Fig. 2, being the approximate elevation of a helical joint, the development of that joint (*fg.*, Fig. 3) must be longer than its elevation. Therefore, the development of the line being longer than its elevation, it is obvious that the joint mould as drawn will be short, because the long edges of the joint moulds must (if properly projected) be exactly equal in length to the lengths of the joint arrises to which they refer and not to the lengths of the elevation of these joint arrises: thus, the *exact length* of this helical joint on the convex side of the wall and its corresponding edge on the joint mould is shown by the development to be *fg.*, Fig 3.

If the joint moulds had been projected on to a line parallel to *ml.*, Fig. 3, instead of the line parallel to M′ L′, Fig. 2, then the height of the resulting moulds would have been an approximation.

I might add that the development of the arris of the joint F.G. on the concave side of the wall will be shorter than the development of the same joint (*fg.*) on the convex side. Here again it is evident that the lengths of the long edges of the joint moulds in Fig. 4 are wrong.

The fallacy of "G. R. B.'s" method of projection will be clearly seen from the accompanying sketch, in which the angle of the joint to the horizontal has been exaggerated.—Yours truly,

GLASGOW. J. S. B.


f
F′
ELEVATION OF HELIX
DEVELOPMENT OF HELIX ON CONVEX SIDE.
DEVELOPMENT OF HELIX ON CONCAVE SIDE OF WALL.
ELEVATION.
G
APPROXIMATE HEIGHT OF JOINT MOULD FROM DEVELOPMENT.
HEIGHT OF JOINT MOULD ACCORDING TO "G.R.B.'s" METHOD.
F
PLAN.
G

CUTTING MOULDS FOR FLAT ARCH.

Notes on Competitions

List of Competitions Open.

Deposit for, conditions given where known.

DATE OF DELIVERY		COMPETITION.
Nov.	30	LIBRARY AT NEWTON-IN-MAKERFIELD.—Cost £4,000. Particulars from C. Cole, clerk to U.D.C., Town Hall, Earlestown, Lancs. No deposit.
Dec.	12	LAY-OUT OF RIDDRIE ESTATE, GLASGOW.—Premiums of £75, £50 and £25. Particulars from A. W. Myles, town clerk, City Chambers, Glasgow. No deposit.
Dec.	31	LABOURERS' COTTAGES AT DUBLIN.—Premiums of £50, £30 and £20. Particulars from A. R. Barlas, secretary, L.G.B. Offices, Dublin. No deposit.
Dec.	31	DUAL SECONDARY SCHOOL AT GOOLE.—Premiums £50 and £25. Particulars from James W. Johnson, clerk to Governors, Council Offices, Goole. Deposit £2 2s.
Dec.	31	NURSES' HOME AT GENERAL HOSPITAL, WOLVERHAMPTON.—Particulars from J. Stephen Neil, House Governor and Secretary, General Hospital, Wolverhampton. No deposit.
Dec.	31	BATHS AT ASHTON-IN-MAKERFIELD.—Limited to architects in Wigan and Leigh Poor Law Unions. Particulars from A. Sykes, clerk, Council Offices, Ashton-in-Makerfield. No deposit.
1907 Jan.	19	LIBRARY AT PLYMOUTH.—Premiums £50, £30 and £20. MUSEUM AND ART GALLERY AT PLYMOUTH. Premiums £25, £20 and £10. Limited to local architects. Particulars from Borough Librarian, Plymouth
Feb.	1	CHILDREN'S HOSPITAL AT SUNDERLAND.—Premiums of £100, £50 and £25. Particulars from T. Robinson, secretary, Infirmary Offices, Bank Buildings, Sunderland. Deposit £1 1s.
No date.		CONGREGATIONAL CHURCH, SCHOOL AND MANSE, GRIMSBY.—To cost £8,200. Premiums of 25, 15 and 10 guineas. Particulars from E. L. Bridge, Fish Docks, Grimsby. Deposit £2 2s.

Barnsley High School for Girls.

The extended time for sending in drawings expires on Friday, November 30th. The assessor is Mr. E. R. Robson, of Westminster.

Assessors.

Mr. Collcutt is to be complimented upon his frank avowal—in his presidential address—of his disbelief in the efficacy of a jury of assessors, and his conviction that one assessor—acting alone or with the aid of assistants—is the only possible means of obtaining a reasonable award, not so much for the logic of his deductions as for the eminent opinion which provides food for thought and matter for discussion. The President's pessimism is the result of the Peace Palace competition, in which he formed one of an international jury of assessors who acted the farce of selecting a design which could not be executed under double the stipulated amount, and then recommended, practically, that the design was worthless. The British representative was not party to the selection. Recently the architects of Holland have lodged a protest against the erection of the selected design; the fiasco will, no doubt, be rendered complete by a building dissimilar in every respect to the successful competitor's original conception. The Hague Peace Palace Competition was a failure, but the subject and circumstances were of an unusual kind, and the assessors were of different nationalities with each his prejudices. The marvel is that any agreement of opinion was arrived at, at all. Does it follow that every competition with more than one assessor must be a failure? At this juncture the London County Hall Competition proves particularly interesting, for there are to be three assessors, and until these gentlemen have proved their metal, it would be, perhaps, wise to reserve an opinion. Mention of the County Hall Competition brings a reminder that one of the assessors is to be chosen by the competitors. This appears to be the best possible way of selecting an assessor and one far in advance of any of the methods now in vogue. The delegation, to an individual, of the power to nominate assessors is fraught with more than one objection, notably—individuals do not possess equally sound judgment, and individualism provokes place-seeking and time-serving in others where independence and freedom of opinion are most necessary. The adoption of a system of selection by competitors would have to be accompanied by a variation of method, especially as regards the drawing up of the conditions. The most approved present course is for the assessor to be appointed early to advise upon the scheme and draw up the conditions. This preliminary expert advice would be still necessary and could be rendered separately and apart from the ultimate judging. The competitors' nominations for the assessor would be sent in with their designs, thus confining the selection to bona fide competitors. As the original adviser might make a desirable assessor his name could be put forward by the promoters as their nominee. To obviate the delay of ascertaining whether the person selected would be willing to act, a roll might be kept at the R.I.B.A. of the names and qualifications of architects desirous of undertaking the duties of assessors, whether members of the Institute or otherwise, and copies of the list could be available for a moderate fee. A little consideration will show that scale charges would then have to be adopted for the separate duties of preliminary advice and drawing up conditions and for assessing, the latter to be governed by the estimated value of the proposed work and the number of designs submitted. Space will not permit of more than the above outline of a system, which, if generally adopted, would go far towards obviating most of the evils attending present systems, by substituting for a privileged class of assessors a body of candidates from which selection could be made by the persons most concerned. The efficiency of the latter body could be promoted by the immediate removal from the roll, upon the representation of the competitors, of the name of any assessor who proved himself incompetent. The adoption of scale charges might be opposed by the members of what has been described as the privileged class upon the contention that expert services are worthy of special fees. The answer would be that scale charges apply in ordinary practice and that the biggest commissions fall, with few exceptions, to the most competent.

Labourers' Cottages, Dublin.

The following is a summary of the conditions of this competition :—

A competitor may submit alternative designs not exceeding three in number, which will all become the property of the Board if a premium is awarded for any one of them. All other designs will be returned.

The premium may be withheld if, in the opinion of the Board, none of the designs are suitable.

The award of a premium will not confer any right on the successful competitor to any further remuneration or employment in connection with any cottages built in accordance therewith.

Cost of erection of cottage with simple outoffices (such as open shed and pail closet) is not to exceed £130.

External walls less than 10ins. thick will not be considered suitable unless plastered with cement.

Four apartments are to be provided in all—three bedrooms and a kitchen or living room.

The site is to be taken as level, the height of the ground floor at 9ins. over ground level, and the full depth of foundations at 18ins. under ground level.

The clear height of rooms on ground floor to be at least 8ft., and of any room partly in the roof at least 8ft. for one-half of its area and not less than 4ft. at the walls.

The contents of kitchen or living room is not to be less than 1,200 cu. ft.; one bedroom must contain at least 900 cu. ft., and no bedroom is to be smaller than 600 cu. ft. In each bedroom a suitable position for a bed, 6½ft. by 4ft., is to be indicated by dotted lines.

Each room is to have window openings with an area of at least one-twelfth the floor area. It is desirable that each apartment should have a fireplace, and that not more than one bedroom should be entered through another, and very careful attention is to be given to means for easy ventilation of all rooms by the windows and otherwise.

All designs are to be prepared in the form of full working drawings to the scale of 8ft. to an inch, with all principal dimensions clearly figured thereon, and one sheet of details to the scale of 2ft. to an inch.

A plan of each floor, at least 2 sections and 3 elevations are required.

For each design the author is to furnish on a special form an estimate and a specification.

Obituary

Mr. Charles Locke Eastlake, for many years Keeper and Secretary of the National Gallery, died last week, aged about 70. After leaving school he was trained as an architect in the office of the late Mr. Philip Hardwick, R.A., won a medal in the Academy Schools, and travelled for three years on the Continent sketching architecture in France, Italy, and Germany. In 1866 he became secretary of the Royal Institute of British Architects. He was appointed to the National Gallery by Lord Beaconsfield in 1878 and held the post for 20 years. He retired in 1898.

Reinforced Concrete.— The Patent Indented Steel Bar Company's system of steel reinforcement is being used for the whole of the floors of the Waldorf Hotel in Aldwych, and also for the foundations and the floors of the printing machinery department of the new "Morning Post" building. Amongst other important contracts, this company is supplying the steel reinforcement for the new dock works now in course of construction in Scotland by the Coventry Ordnance Co.

Views and Reviews.

Suburban Houses.

Recently there has been no lack in the issue of books on small houses. Usually, however, they have been compilations of designs by various architects, the illustrations, moreover, being small, and, not infrequently, without plans. This is not the case with the book before us. It represents the work of Mr. Quennell only, and the illustrations are fine large collotypes, excellently printed, with plans on a generous scale. The houses shown are mostly on an estate which has been developed at Hampstead. The author says in his preface that the book represents "work done with a certain amount of success from the business point of view, and it is hoped that it will be more convincing than a series of suggestions or designs which have not been carried out. All the houses illustrated have been built on regulation building plots of varying width; they have been built for sale—and they have all been sold." With that clear definition, therefore, we must not expect to find in the book any clever excursions in house design, which, however interesting to architects able to appreciate them, would undoubtedly be tabooed by the general public—and the houses "have been built for sale." They are, nevertheless, good, straightforward examples, and the book being a record of work actually carried out, we have no doubt it will attract considerable interest.

"Modern Suburban Houses," by C. H. B. Quennell. London: B. T. Batsford, price 16/- nett.

Serial Publications on Construction.

In our issue of October 3rd we published a review of the first parts of three publications interesting to building students which are being issued serially by Messrs. Cassell & Co. One of these is Prof. Adams's "Building Construction," which was issued in this serial form before and is also to be obtained in volume form, in which latter we have reviewed it. It is an excellent treatise on many points that are not to be found dealt with in other books on building construction, but is, of course (as Prof. Adams claims for it), only a supplementary work to the recognised books on building construction. Being so well done, we only regret that Prof. Adams did not go further and deal with the whole subject, as we feel that he could have very much improved on the methods of some other authors, avoiding, at the same time, the objection of having to refer to two or more works for a complete treatment of the subject. The issue of the book serially is an excellent thing for students. It is well produced and many of the parts contain coloured plates, so that the price of it is very low.

As regards Cassell's "Carpentry and Joinery," Parts 2—8 certainly bear out the promise contained in the first part. The treatment of the subject is thoroughly practical and many illustrations are included which have been well and clearly drawn, so as to provide information as regards methods of framing parts of construction that are too often slurred over in other books on the subject. The perspective and isometric drawings are excellent in this way, and for the first time, so far as we know, this method of illustrating the subject is being thoroughly worked out in all the various parts of construction. From these the student is able to obtain in a few minutes an idea of the way in which the work is done practically, which can never be so clearly shown by elevations, plans and sectional drawings. Thus, in Part 3, there is an isometric drawing of the method of supporting joists round a brickwork fender in a basement; in Part 4 views of a double floor and framing around a chimney-breast; in Part 6 isometric views of king-post, queen-post and Mansard roofs and the apse-end of a collar-beam truss roof to a church; in Part 7 the inside of a plank truss roof; and in Part 8 the framing of dormer windows. Many points in the practice of carpentry and joinery are explained, which it is customary to record but not to give the reason why such should be done. We might refer, for instance, to the explanation of why herringbone strutting is superior to solid strutting.

As regards the third work to which we referred—namely, Prof. Adams's "Engineers' Handbook," we confess that the succeeding parts have been rather disappointing—not because they do not provide an immense amount of information in a most concise and intelligible form, but, up to the present, no illustrations have been included, and many of the explanations would be much improved in clearness by having small illustrative diagrams. Of course, the book is not a treatise, but only a collection of memoranda which it is presumed the reader has already studied theoretically in other books, in the classroom or in practice. The mass of data here collected covers such a wide field that we doubt if more than an exceedingly small number of engineers have a sufficient all-round knowledge to grasp the summarised information easily. No doubt specialists in each branch will be able to understand Prof. Adams readily, but a book like this is used by engineers of all kinds and referred to on points in branches of engineering with which the specialist is not intimately concerned. Consequently, such a book of memoranda should make it easy for the reader to obtain an adequate grasp of the subject in the shortest possible way, and illustrations undoubtedly not only convey information much more quickly, but enable the subject to be realised in a manner which pages of description would not do. As showing the style in which we should have liked to have seen the book illustrated, we might cite that well-known German handbook, "Das Ingenieurs Taschenbuch."

"Building Construction," by Prof. Henry Adams. Parts 2—8.

"Carpentry and Joinery," edited by Paul N. Hasluck. Parts 2—8.

"Engineers' Handbook, comprising Facts and Formulæ, Principles and Practice," by Prof. Henry Adams, M.Inst.C.E., M.I.Mech.E. Parts 2—8.

(Each published in 24 weekly parts, price 3d. each nett.) London: Cassell & Co., Ltd.

A Glossary of Architecture.

This small glossary is useful. It is very suggestive of Parker's "Glossary," but is more recent and contains a good deal more information. We hardly see the necessity, however, for the constant references to the author's indebtedness to his father for suggestions and information. The book, too, is dedicated to his mother. Evidently it is a family affair. On the whole, however, the book well merits a place in the architect's library.

"A Glossary of English Architecture," by Thomas Dinham Atkinson. London: Methuen & Co., price 3s. 6d. nett.

New London Buildings

At yesterday's meeting of the London County Council the Building Act Committee reported the following applications under the London Building Act, 1894, their recommendations as to consent or refusal being appended in *italics*:

Re-erection of St. Michael's Hall, Ullin Street, Bromley, on the application of J. E. K. and J. P. Cutts, on behalf of the Rev. G. R. P. Preston. (*Consent.*)

Buildings on the site of Nos. 166 to 174, Acre Lane, Brixton, on the application of F. J. Eedle and Meyers, on behalf of A. T. Janes. (*Consent.*)

Projecting pilaster in front of No. 93, Great Tower Street, City, on the application of Lyne & Son, on behalf of Manfield & Sons. (*Consent.*)

Bay windows to three houses on the southern side of Upper Richmond Road, Putney, in connection with the application of E. J. Partridge. (*Consent.*)

One-storey shop in front of No. 399, Battersea Park Road, Battersea, to abut also upon Culvert Road, on the application of J. A. J. Woodward & Sons, on behalf of E. H. Disney. (*Refusal.*)

Water closets and the retention of a forecourt fence wall at the Kingsland Secondary School for Girls, Colvestone Crescent, Hackney, at less than the prescribed distance from the centre of the roadway of Birkbeck Road, on the application of T. J. Bailey, on behalf of the Education Committee of the Council. (*Consent.*)

Retention of a one-storey addition at the rear of No. 231, High Road, Lee, on the application of A. Young, on behalf of the Improvements Committee of the Council, with a boundary fence at less than the prescribed distance from the centre of the roadway of Turner Road. (*Consent.*)

One-storey shop in front of No. 1, Hamilton Road, Highbury, on the application of H. A. Geyer & Co. (*Refusal.*)

Buildings on the western side of Allfarthing Lane, Wandsworth, southward of St. Ann's Hill, to the line and with irregular open spaces at the rear of certain of the buildings, on the application of J. C. Radford, on behalf of C. S. Merrett. (*Consent.*)

Conversion of premises on the north-eastern side of Shrubbery Lane, Wandsworth, eastward of No. 99, Streatham High Road, into shops and dwelling-houses, also a modification so far as relates to the open space at the rear of the said premises, as proposed to be altered, on the application of E. L. Schneider, on behalf of W. Wallis. (*Consent.*)

Re-erection of stabling with a working-class dwelling over upon a site approached from the southern side of Gayford Road, Hammersmith, on the application of J. J. Kelf, on behalf of D. Blackwell. (*Consent.*)

Additions to the Bolingbroke Hospital, Bolingbroke Grove, Wandsworth Common, with portions of the administration block to exceed in height the width of Wakehurst Road, upon which it abuts, on the application of Young & Hall, on behalf of the Committee of the Hospital. (*Consent.*)

Formation or laying out of a street for carriage traffic to lead from Clay Lane to Ennis Road, Plumstead Common Road, so far as relates to an alteration in the position of the widening of Clay Lane southward of the said new street, on the application of J. O. Cook. (*Consent.*)

The Theatre and Music Hall Committee also reported the following:—

Drawing submitted by the Charing Cross, West End and City Electricity Supply Company, Ltd., showing a proposal to fix electric heaters at the Comedy Theatre, Panton Street, also drawings showing a proposal to fix six additional heaters in the stalls and pit. (*Consent.*)

Drawing submitted by W. G. R. Sprague showing the provision of an additional floor to the dressing-room block at the new theatre in course of erection in Shaftesbury Avenue and Rupert Street. (*Consent.*)

Drawing submitted by W. G. R. Sprague showing an additional dressing-room to be constructed at the new theatre in course of erection in Shaftesbury Avenue and Wardour Street. (*Consent.*)

Drawing submitted by Blow and Billerey, showing the proposed reconstruction of the stage at the Playhouse, Northumberland Avenue. (*Consent.*)

Drawing submitted by J. S. Quilter & Son, showing the additions which are in course of erection at the rear of St. Luke's Parochial Hall, Ramsden Road, Balham. (*Consent.*)

Drawings submitted by G. H. Dyball with regard to the proposed isolation of the main electric switches, fuses, &c., fixed to the walls of the pit lavatory at the Tivoli Music Hall, Strand. (*Consent.*)

New Companies.

John Morgan & Son, builders, contractors, &c., Pendarren Street, Aberdare. Capital: 5,000.

A. M. Warne & Co., manufacturers of portable buildings, &c., Fountain Works, Romford. Capital: £2,500.

J. T. Tusting & Sons, dealers in bricks, tiles, and other building materials, 136, Tenison Road, Cambridge. Capital: £3,000.

O. A. Brown, to acquire a lease of certain limestone quarries and other premises at Mitcheldean and Abenhall. Glos., and the business known as the Wilderness Portland Cement Works carried on there, and to adopt an agreement with O. A. Brown. Capital: £35,000.

Notes and News

Bristol Society of Architects.— At the recent opening meeting a paper on "Public Buildings" was read by Mr. H. W. Wills, F.R.I.B.A., of London.

Blackfriars Bridge Widening.—This work will probably be commenced before the end of the year. It is expected to cost between £200,000 and £250,000.

A new Theatre at Aberdeen is being completed from designs by Messrs. Frank Matcham & Co. It will seat 2,500 persons, and has cost £35,000.

A new Drill Hall at Nottingham, for the Robin Hood Rifles, is proposed to be erected. A design has been prepared by Messrs. Brewill & Baily, architects, of Nottingham.

The Great Wheel at Earl's Court.—Messrs. George Cohen, Sons & Co., of 600, Commercial Road, E., write pointing out that they have purchased and are taking down the great wheel at Earl's Court, not Mr. Walter Basset.

The Council Gold Medal of the Surveyors' Institution has been awarded to Mr. W. R. Baldwin-Wiseman, M.Sc., F.G.S., A.M.I.C.E., for his paper on "The Effect of Fire on Building Stones," read at the meeting of the Institution in May last.

Church House, St. Clement's Parish, Hastings, was opened last week by the Bishop of Chichester. The architects were Messrs. Cooper & Coussens, A.R.I.B.A., of Hastings, and the builder was Mr. W. F. Ditch, of Hastings. The cost of the building has been about £1,570.

A new Chapel at Plymouth for the Primitive Methodists is being erected by Messrs. A. R. Lethbridge & Son, from designs by Mr. H. J. Snell and Messrs. Thorneby & Rooke, of Plymouth, joint architects. The chapel occupies a site at the junction of Cobourg Street and York Street, and is estimated to cost £9,000.

The Tower of the Parish Church of Peterstone, near Marshfield, Mon., is to be restored under the direction of Mr. Dashwood Caple, of Cardiff, Architect and Diocesan Surveyor for Monmouthshire. Every care is to be taken to avoid disturbing the old work more than is absolutely necessary. The church is said to be one of the finest in the county. The tower, however, is much in need of repair; last summer one of the pinnacles fell down.—At Llanishen Church, Mon., the tower, which was struck by lightning about a year ago, has been rebuilt under Mr. Caple's direction.

The David Lewis Club, Liverpool, in connection with the hostel in George George Place, was opened recently. The club is intended for the benefit of the hard-working poor of Liverpool, in addition to those residing in the hostel, and includes a theatre capable of accommodating about 1,000 people. The architect was Mr. J. Francis Doyle, and the builder Mr. Isaac Dilworth, of Liverpool. The hostel was fully described and illustrated in The Builders' Journal for January 18th, 1905.

Leeds and Yorkshire Architectural Society:—In the course of his presidential address on Thursday last, Mr. H. S. Chorley, M.A., F.R.I.B.A., referred to the fire at Selby Abbey, which, he said, had demonstrated the danger of timber roofs, and raised the question whether it was possible to put fire-resisting vaulted roofs in Gothic churches. The stability of such buildings as the Pantheon and the Basilica of Constantine at Rome was due to the fact that their roofs were made of imperishable materials. Another question worthy of discussion was the preservation of our ancient monuments. Mr. Chorley urged that it was necessary that there should be a system of survey and cataloguing to obtain a complete knowledge of all the architectural treasures the country possessed. Full insurance against fire should be insisted upon in every case, and an inspector of ancient monuments should be appointed. The president also referred to the garden city movement and to registration; for the latter there was a growing necessity.

Books on Reinforced Concrete.— Messrs. Archibald Constable & Co. hope to publish as early as possible in the coming year a Pocket-Book on Reinforced Concrete and Steel Frame Construction, by Messrs. Charles F. Marsh and W. Dunn, joint authors of the 3rd edition of "Reinforced Concrete." The pocket-book will contain information on practical construction and design with diagrams and tables for the simplification of the work necessary for the calculations of the various structures dealt with. Examples will also be given showing the methods of working and the applications of the diagrams and tables. Such a book will be welcomed by all those interested in this form of construction, since it will contain in a condensed and handy form much useful information both for engineers and architects responsible for efficient design, and also for those engineers, builders, and overseers engaged on the practical work of construction. The new, 3rd and revised, edition of "Reinforced Concrete" by Mr. Charles F. Marsh will be issued in the course of a few weeks. In its preparation, in which no pains have been spared to bring the subject exhaustively up-to-date, Mr. Marsh has been associated with Mr. W. Dunn, F.R.I.B.A., as joint author.

Enquiries Answered.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional, or legal matters.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Books on Sewerage, Sewage Disposal, etc.

Carlisle.—Beta writes: "Can you recommend good books on the following subjects:—(1) Sewerage (I have Col. Moore's 'Sanitary Engineering,' and Waring's 'Drainage.') (2) Hot-water service and heating. I want a book that gives the method of arriving at sizes of pipes, boiler and cylinder. (3) Sewage disposal. Do you consider Santo Crimp's book a good one? I have no knowledge of chemistry; is this necessary? (4) Pumping machinery. I want a book giving the outline of the subject to enable one to select the kind of pump for the given condition, the duty to specify, the information to give manufacturer, and to aid one in selecting the best design, not one that would be required by a maker. (5) Advanced applied mechanics. The books are required for a junior assistant in a civil engineer's office who is engaged on sewerage and water schemes for small towns and villages, and who has a knowledge of mathematics sufficient for the South Kensington Advanced examination."

(1) "Practical Sanitary Engineering": Francis Wood, 8s. 6d. (2) "Warming Buildings," by C. Hood and Frederick Dye, 15s., and "Heating by Hot Water, Ventilation and Hot Water Supply," by Walter Jones, 6s. 6d. (3) No; now out of date. You should have Dr. Rideal's book "Sewage and the Bacterial Purification of Sewage," 14s. This will give you all the chemical and bacteriological factors; and our "Municipal Engineers' Specification, No. 1" (3s. 3d. post free), which contains a good summary that you should master before reading up Rideal's work, as the subject is very intricate. An additional work that would be very useful is Mr. A. J. Martin's Summary of the Royal Commission Evidence, called "The Sewage Problem," 8s. 6d. (4) "British Progress in Pumps and Pumping Engines," Philip R. Björling, 6s. nett. (5) "Manual of Applied Mechanics," by Prof. W. J. M. Rankine, 12s. 6d.; "Applied Mechanics," by Prof. John Perry, 7s. 6d., and "Mechanics Applied to Engineering," by Prof. John Goodman, 8s. All these can be obtained from our offices, post free, at the prices given.

Liability for Paving and Curbing.

KEY writes: "I have some land with about 1,000ft. frontage on one side of a road—an old one repaired by the district council. On the oposite side houses have been built for more than 20 years. The road is not a 40-ft. road, but varies in width. I have built some villas on my side. Can the district council make me do the paving and curbing (the other side of the road has been done), or can I claim compensation for land given up?"

We do not think you can be forced to pay for this; but the ruling cases do not exactly cover the facts stated by you. The nearest is the case of *West Ham Corporation v. McDowall,* decided against the Corporation at West Ham Police Court, January 24th, 1894, and *White v. The Vestry of Fulham,* decided against authority on appeal from magistrates' decision to Queen's Bench Divisional Court, January 21st and April 18th, 1896 (before Justice Hawkins and Justice Vaughan Williams). You should take legal advice.

Kempe's Glass.

Referring to the enquiry under this head in last week's issue, Mr. Walter E. Tower, of London, W., writes:—"Mr. Bodley's fine church at Hoar Cross, Staffordshire, does not contain any work by Mr. Kempe; but, on the other hand, the Duke of Newcastle's church at Clumber has several windows. Your enquirer also should know of the large Church of St. Hilda at Whitby, which contains many windows of Mr. Kempe's, two of them very large. There is also a fine series of windows by the same hand at Sedbergh School Chapel, Yorks, and Wednesbury Parish Church should not be passed over. Several churches at Brighton show complete, or nearly complete, series, and a very fine example was lately erected in the great east window of the new chancel to St. Peter's. Mr. Bumpus does not do justice to as many as ten windows at Lichfield Cathedral, over and above those named in the chapter-house: these are in the nave, the south transept, and choir aisles; St. Chad's Chapel and two great windows of ancient glass in the Lady Chapel also show his efforts in this cathedral. At Gloucester Cathedral there are as many as five or six windows in the ambulatory of choir; and, again, in the south transept of Chester Cathedral may be noted four windows as a consecutive series."

Construction of Swimming-Bath.

CHORLEY WOOD.—C. R. writes: "Kindly inform me of a simple way to construct a swimming-bath. The question is entirely one of expense, as the work is to be carried out by a local club with subscriptions from local residents. The ordinary methods are well known to me, but the simplest and cheapest method must be adopted. The site is open, and on the banks of a stream. The soil is peat for 3ft. or 4ft., and under this lies a bed of ballast, through which the water rises as easily as through a sieve. It is necessary to excavate sufficiently to give a depth of water varying from 3ft. to 7ft., and the water level will be about 18ins. from the ground level. I wish to obviate the necessity of pumping, which would entail a large expense, and the only way I can suggest is to drive piles around the area to be excavated, and encase with sheet piling to the necessary depth. The question of flooring is the most difficult problem in these circumstances. It is, of course, desirable to have this of concrete if possible, but I cannot see my way to do this. I can only suggest a flooring of loose sand, which would be least harmful to the feet, and could be easily deposited. Can you suggest anything better, or any simpler mode of construction?"

We think the best thing you can do is to drive interlocking steel sheet piling on the method largely used in the United States and recently introduced into this country by The British Steel Piling Co., of Dock House, Billiter Street, E.C. This sheet piling could be left in permanently, or if you can spare the expense a concrete retaining wall could be constructed inside and the steel piling then withdrawn. You ought to adopt a concrete bottom, and covered with tiles. This would get slimy unless cleaned. On the other hand, the sand which you propose would not prevent the loam working up, and would get dirty. We think that you might compromise by laying concrete paving slabs on the bottom and putting sand on these. The sand could then be renewed occasionally.

Rubber Flooring.

GLASGOW.—LIBRARIAN writes: "Please give names and addresses of firms who supply india-rubber flooring."

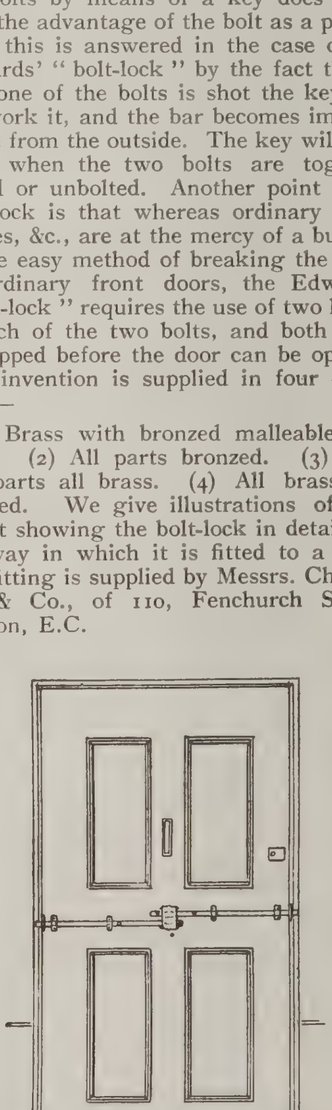
Messrs. A. L. Gibson & Co., 19, 20 & 21, Tower Street, Upper St. Martin's Lane, W.C.

Trade and Craft.

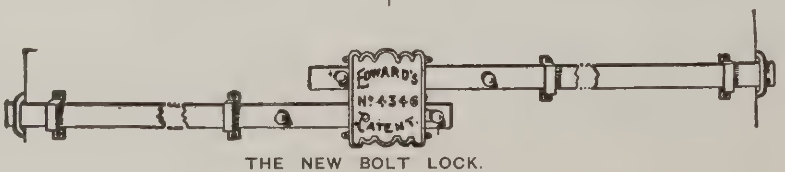
An Ironmongery Novelty.

Our method of securing entrance doors by means of bolts is effective but crude. When the bolts are shot it is usually quite impossible to unbolt them from the outside. This, of course, in one way is an advantage, but there are disadvantages. A new patent bolt, which is at the same time a lock, in so far that it can be opened from the outside by means of a key, has just been placed on the market which seems to effectually solve the problems involved. Householders who are nervous of leaving the front door unbolted and yet must do so because members of the family will arrive home late, can, by fitting this "bolt-lock," bolt the door before retiring for the night and still leave it possible for the late comers to unbolt it from the outside by means of their key. The point will, of course, be raised that the fact that it is possible to unlock the bolts by means of a key does away with the advantage of the bolt as a protection; this is answered in the case of the Edwards' "bolt-lock" by the fact that if only one of the bolts is shot the key will not work it, and the bar becomes impenetrable from the outside. The key will only work when the two bolts are together bolted or unbolted. Another point about this lock is that whereas ordinary bolts, latches, &c., are at the mercy of a burglar by the easy method of breaking the glass of ordinary front doors, the Edwards' "bolt-lock" requires the use of two hands to each of the two bolts, and both must be slipped before the door can be opened. This invention is supplied in four qualities:—

(1) Brass with bronzed malleable iron bolts. (2) All parts bronzed. (3) Bolts and parts all brass. (4) All brass, all bronzed. We give illustrations of this patent showing the bolt-lock in detail and the way in which it is fitted to a door. The fitting is supplied by Messrs. Chittenden & Co., of 110, Fenchurch Street, London, E.C.



BACK OF DOOR, SHOWING BOLT FIXED.



THE NEW BOLT LOCK.

Complete List of Contracts Open.

With a few exceptions, news of Contracts Open are not repeated after they have been published once in these columns, so that readers will find particulars in our previous issues of other contracts that still remain open.

Unless expressly stated to the contrary, all deposits required for bills of quantities, &c., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair-wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

Nov. 28. Belfast.—*Alterations to Peter's Hill Baths*, for the Baths and Lodging House Committee. Drawings and specification may be seen, form of tender obtained, and bill of quantities received on payment of £1 1s., in City Surveyor's office. Sealed tenders, endorsed "Alterations to Peter's Hill Baths," to be lodged with S. Black, town clerk, before 10 a.m. on Nov. 28.

Nov. 29. Belfast.—*Erection and completion of a warehouse* in Curtis Street, Belfast, for Messrs. The Central Furnishing Company. The drawings and specification and conditions of contract, with further particulars, may be seen with T. W. Henry, architect, Ocean Buildings, Belfast, between the hours of 10 and 5. Tenders, endorsed, to be lodged with him not later than Nov. 29, at 12.

Nov. 29. Beaminster.—*No. 1, Building of new bath-room* and W.C.; No. 2, erection of new piggeries, for the Guardians of the Beaminster Union. Plans and specifications can be seen of R. Leigh, clerk to the Guardians, Beaminster, from 10 a.m. to 4 p.m. any week-day (Saturdays excepted). Tenders (separate for each work) to reach him by 9 a.m., or be delivered at the Union House, Stoke Abbott, before 11 a.m. on Nov. 29.

Nov. 29. Scarborough.—*Construction of boundary walling*, &c., at the Central Council Schools playground, Columbus Ravine, Scarborough. Plans and specifications may be seen, and form of tender and bills of quantities obtained on application to H. W. Smith, A.M.I.C.E., borough engineer and surveyor, Town Hall, Scarborough. Sealed tenders, endorsed "Tender for Boundary Walling, Central Council Schools," in an envelope provided for the purpose, to be delivered at the office of D. A. Nicholl, town clerk, not later than 12 noon on Nov. 29. A deposit of £1 1s. is to be made with the Borough Accountant before any particulars or form of tender can be supplied.

Nov. 30. Mansfield.—*Erection and completion of additional buildings* in connection with Tin Works, Rock Valley, Mansfield, for Messrs. Barringer, Wallis & Manners, Ltd. Applications to be sent in to Vallance & Westwick, architects, Mansfield, not later than Nov. 30. Bills of quantities will be supplied on payment of £2 2s.

Nov. 30. Ashford.—*Widening of the bridge* over the ditch, Beaver Road, near the Sewage Pumping Station, for the U.D.C., in accordance with the plan and specification, which may be seen on application to W. Terrill, surveyor, North Street, Ashford, Kent. Sealed tenders, endorsed "Bridge Widening," to be sent to J. Creery, solicitor, clerk, 11, Bank Street, not later than 5 p.m. on Nov. 30.

Nov. 30. Ystrad Mynach.—*Erection of a proposed hotel* at Ystrad Mynach for Messrs. D. Williams & Co., Taff Vale Brewery, Merthyr Tydfil. Plans, specifications, and bills of quantities may be seen at the above address, or at the office of R. Edwards, architect and surveyor, Brynheulog, Treharris. Builders desiring to tender must send in their names to the architect, together with a deposit of £2 2s., when bills of quantities, form of tender, and particulars will be forwarded. Sealed tenders to be sent to W. Griffiths, D. Williams & Co., Taff Vale Brewery, Merthyr Tydfil, endorsed "Tender for Erection of Half-way House Hotel," on or before Nov. 30.

Dec. 1. Bangor.—*Extensive additions and improvements* to the Criterion Hotel, Bangor, Co. Down. Plans and specifications relating to the work may be seen of J. V. Brennan, C.E., architect, Belfast Bank Chambers, Belfast. Sealed and endorsed tenders to be lodged with him on or before Dec. 1.

Dec. 1. Tonypandy.—*Erection of additions*, for the Hibernian Band Institute, Tonypandy, to their premises, No. 76, Kenry Street, Tonypandy, where plans and specification may be seen. Sealed tenders to be delivered to J. Brookes, secretary, tobacconist, Tonypandy, on or before Dec. 1, endorsed "Tender."

Dec. 1. Dublin.—*Erection of a new "Home"* in connection with the Orphanage of St. Vincent de Paul, Glasnevin. Bills of quantities may be had on application to Mumby & O'Rourke, surveyors, 15, College Green, on deposit of £2. Tenders. sealed, and marked "Orphanage, Glasnevin," to reach J. P. Wrenn, M.R.I.A.I., architect, 189 Great Brunswick Street, Dublin, not later than 12, December 1.

Dec. 1. Kinver.—*Erection of a cattle shed* at Whittington House Farm, near Kinver, for the Upper Stour Valley Main Sewerage Board. Plan and specification may be seen at the offices of the Joint Engineers, E. B. Marten, M.I.C.E., and W. Fiddian, F.S.I., Old Bank Offices, Stourbridge. Sealed tenders addressed to G. Green, clerk to the Board, High Street, Cradley Heath, and endorsed "Tender for Cattle Shed," are to be delivered at or before noon on Dec. 1.

Dec. 3. Woodbury.—*Alterations and additions* to The Lodge, near Woodbury, Devon, for Mr. W. Arnold, of Woodbury. Builders willing to tender may see the plans and specifications of E. H. Harbottle & Son, architects, County Chambers, Exeter. Tenders to be delivered to them on or before Dec. 3.

Dec. 3. Boston.—*Converting part of the Fish Market* into a lavatory, &c., and converting the old Police Station into a shop. Plans and specifications can be seen at the office of G. E. Clarke, Ass.M.I.C.E., borough surveyor, where forms of tender can be obtained. Tenders to be sent to M. Staniland, town clerk, Municipal Buildings, Boston, on or before Dec. 3, marked "Tender for Lavatories and Shop."

Dec. 3. Blackburn.—*Erection of extensions to* Accrington Road Council school, to accommodate 300 children, for the Blackburn B.C. Plans and specifications may be seen and bills of quantities and forms of tender obtained at the office of Cheers & Smith, architects, 24, Richmond Terrace, Blackburn, on payment of £2 2s. Sealed tenders, on forms supplied, endorsed "Accrington Road Extensions," to be sent to A. Gow, director, Education Office, Library Street, Blackburn, on or before Dec. 3.

Dec 3. Wakefield.—*Repairs to Ferrybridge Bridge*, situate on the Doncaster and Tadcaster main road, within the rural district of Pontefract. General conditions, specification, and bill of quantities can be obtained at the office of the West Riding Surveyor, County Hall, Wakefield, on the deposit of £1. Cheques, &c., should be sent to the West Riding Treasurer, at the County Hall, Wakefield. Sealed tenders, duly endorsed, to be delivered at the office of F. G. Carpenter, West Riding surveyor, County Hall, Wakefield, not later than Dec. 3.

Dec. 3. Strabane and Letterkenny.—*Construction of passenger and goods stations* along this line for the Directors of the Strabane and Letterkenny Ry. Co. The drawings, specifications, and measurers' quantities may be seen at the office of J. Barton, engineer, Exchange Buildings, Dundalk. Tenders must be sent upon the form which will be supplied to intending contractors, and must be with J. Gillespie, secretary of the company, Londonderry, on or before Dec. 3.

Dec. 3. Cove, Kincardineshire.—*Construction of new station buildings* at Cove, Kincardineshire, for the directors of the Caledonian Railway Co. The drawings may be seen at the office of the Company's Engineer, Buchanan Street Station, Glasgow, or at the office of the Company's District Engineer, General Station, Perth, where copies of the specification and schedule may be obtained on payment of £2 2s. Sealed tenders, endorsed "Tender for Reconstruction of Cove Station Buildings," to be lodged with J. Blackburn, secretary, Caledonian Railway Company's offices, 302, Buchanan Street, Glasgow, on or before Dec. 3.

Dec. 3. Dublin.—*Erection of a stores building* (two storeys) in brick, 181ft. long by 50ft. wide, with steel principal roof and steel girder supported floor, also offices, 34ft. long, making a total length of block 215ft., at their Dundalk Station, for the Great Northern Railway Co. (Ireland). Parties wishing to tender may see the drawings and specification at the office of W. H. Mills, engineer-in-chief, Amiens Street, Dublin, or copies of them at the office of the District Engineer, Belfast, and can obtain at the said offices lithographed copies of the eight drawings and specification and form of tender on payment of £2 2s. (not returnable) per set. Quantities are not supplied. Tenders for the brickwork, or steelwork, or for the whole of the work, to be made out on the forms supplied by the Company, and endorsed "Tender for Stores Building," should be delivered to T. Morrison, secretary, Secretary's Office, Amiens Street Terminus, Dublin, not later than 10 a.m. on Dec. 3.

Dec. 3. Hexham.—*Restoration and completion of* Hexham Abbey Church, Hexham, Northumberland. Builders of position and experience in church building willing to compete in limited competition for the building of the new nave are invited to send in their names before or by Dec. 3. Upon the receipt of the applications the Committee will, under the advice of T. Moore, F.R.I.B.A., architect, of 37, Old Queen Street, Westminster, London, S.W., proceed to make selection from among the applicants to compete for the above work. Address, with references and a list of principal works of the kind already carried out, to the Rector, Hexham Abbey Church, Hexham.

Dec. 4. Manchester.—*Proposed alterations* at the Union Offices, All Saints', Manchester. Plans, &c., may be seen and bills of quantities obtained from C. Clegg & Son, architects, 21, Spring Gardens, Manchester, upon payment of £1 1s. Sealed tenders enclosed in the official envelopes must be delivered to D. S. Bloomfield, clerk to the Guardians, at the Union Offices, All Saints', Manchester, not later than 5 p.m. on Dec. 4.

Dec. 4. Droitwich.—*Erection of a new Post Office* at Droitwich, for the Commissioners of H.M. Works. Drawings, specification, and a copy of the conditions and form of contract may be seen on application to the Postmaster at Droitwich between the hours of 11 a.m. and 3 p.m. Bills of quantities and forms of tender may be obtained from the Secretary on payment of £1 1s. Tenders must be delivered before 12 noon on Dec. 4, addressed to the Secretary, H.M. Office of Works, &c., Storey's Gate, London, S.W., and endorsed "Tender for Droitwich New Post Office."

Dec. 4. Llanelly.—*Certain work required at* the Intermediate Schools. For further information apply to the Head Master. Tenders to be sent to J. H. Blake, clerk, Llanelly, on or before Dec. 4.

Dec. 4. Romford.—*Erection of a home* for 20 nurses and connecting corridor at the Infirmary at Romford Union, in accordance with plans and specification prepared by J. Kennedy, architect, 25, Bedford Row, London, W.C., from whom bill of quantities and form of tender may be obtained upon payment of a deposit of £3 3s. The person whose tender is accepted may be required to enter into a bond with two approved sureties in the sum of £500 as security for the due performance of the contract. Sealed tenders, endorsed "Tender for Nurses' Home," must be sent to W. Smith, clerk, 13, North Street, Romford, on or before Dec. 4, by 4 p.m.

Dec. 5. Manchester.—*Erection of the Beaver Road Municipal School*, Didsbury, Manchester. Plans may be seen, and a copy of the bills of quantities (including specification) obtained, at the Education Offices, Deansgate, Manchester, on a deposit of £2 2s. Tenders, on the official forms, and enclosed in the envelopes provided, must be delivered not later than Dec. 5. Cheques to be made payable to the Accountant, Education Offices, Deansgate, Manchester.

Dec. 5. Twickenham.—*Erection of new Post Office* at Twickenham. Drawings, specification, and a copy of the conditions and form of contract may be seen on application to J. Rutherford, H.M. Office of Works, &c., Storey's Gate, S.W., where bills of quantities and forms of tender may be obtained on payment of £1 1s. Tenders must be delivered before 12 noon on Dec. 5, addressed to the Secretary, H.M. Office of Works, &c., Storey's Gate, London, S.W., and endorsed "Tender for Twickenham New Post Office."

Dec. 6. London, N.E.—*Erection of an additional Nurses' Home* at their Infirmary, Whipps Cross Road, Leytonstone, N.E., for the West Ham Union. The drawings and specification prepared by R. Banks-Martin, M.S.A., architect, may be inspected at 121, Plashet Grove, East Ham, E., between the hours of 10 a.m. and 4 p.m. Forms upon which tenders must be made, together with a copy of the bill of quantities, can be obtained of F. E. Hilleary, clerk, Clerk's Office, Union Workhouse, Leytonstone, N.E., on payment of a deposit of £20. Fair wages clause. Tenders, sealed and endorsed, must be delivered to the clerk not later than Dec. 6, at 10 a.m.

Dec. 6. Glasgow.—*Erection of a new house* and an addition to the Caretaker's house at Bellahouston Park. The Corporation of Glasgow are prepared to receive tenders for the following works:—(1) Digger, mason and brick; (2) carpenter, joiner, glazier, and ironmongery; (3) plumber and gasfitter; (4) slater and rough cast; and (5) lath and plaster. Plans may be seen, and copies of the schedule of quantities and form of tender obtained at the Office of Public Works, 64, Cochrane Street, and sealed offers, marked "Bellahouston Park—Tender for Work," must be lodged with A. W. Myles, town clerk, City Chambers, Glasgow, not later than Dec. 6.

Dec. 8. Maesteg.—*Rebuilding of Bethania Welsh Baptist Chapel*, Maesteg. Plans and specification can be seen with Rev. Iorwerth Jones, Bethania View, Maesteg, and at the office of W. Beddoe Rees, architect, 5, Dumfries Place, Cardiff, from whom bill of quantities may be obtained on deposit of £1 1s. Tenders to be sent to T. Rees, secretary, 16, Bank Street, Maesteg, on or before Dec. 8.

Dec. 10. Birmingham.—*Erection of a fire station* at Harborne. Plans and specification may be seen, and quantities and form of tender obtained, at the office of H. E. Stilgoe, M.Inst.C.E., city engineer and surveyor, Council House, Birmingham, on deposit of £5. Fair wages clause. Tenders must be made out on the forms provided, and delivered at the above-mentioned office, on or before Dec. 10, endorsed "Tender for Fire Station," and addressed to the City Surveyor.

Dec. 10. Swansea.—*Erection of a pavilion* for the Royal National Eisteddfod, in the Victoria Park, Swansea. The erection will be of a temporary character, and to seat 18,000 persons. Contractors are invited to tender for either or both of the following, viz.:—(a) The timber work; (b) the canvas roofing. Plans and specifications may be seen, and bills of quantities obtained upon payment of £1 1s., on or after Dec. 3, at the offices of the joint architects, H. A. Ellis, No. 10, Fisher Street, Swansea; C. T. Ruthen, Bank Chambers, Swansea; or C. S. Thomas, 15, Wind Street, Swansea. Tenders must be sent, endorsed "Tender for Pavilion," on or before Dec. 10, addressed to A. B. Davies, general secretary, 58, Wind Street, Swansea.

Dec. 13. Bargoed.—*Erection of two cottage homes* at Bargoed, in the Parish of Gelligaer, for the Merthyr Tydfil Board of Guardians. Plans and specification may be seen and bills of quantities obtained at the office of T. Roderick, architect, Clifton Street, Aberdare. Fair wages clause. Sealed tenders, endorsed "Tender for Cottage Homes," must reach F. T. James, clerk to the Guardians, 134, High Street, Merthyr Tydfil, by Dec. 13.

Dec. 11. Cardiff.—*Construction of a bridge* over the railway at Beresford Road level crossing, Cardiff, for the Directors of the Gt. Western Ry. Plans and specification may be seen and forms of tender and bills of quantities obtained at the office of the engineer at Newport Station, between 10 a.m. and 4 p.m. Tenders addressed to G. K. Mills, secretary, Paddington Station, London, and marked outside "Tender for Beresford Road Bridge, Cardiff," will be received on or before Dec. 11.

Dec. 13. Fareham.—*Erection of a school building* and offices, master's house, drainage, road-making, fencing, &c., at Fareham, Hants, for the Governors of Price's Charity. The drawings and specifications and conditions of contract may be seen, and bills of quantities and forms of tender obtained, of W. Cobbett, architect, Fareham, Hants, on payment of a £5 Bank of England note. Sealed tenders, endorsed "Tender for Price's Schools," to be delivered to L. Warner, clerk to the Governors, Town Hall Chambers, Fareham, not later that 12 noon on Dec. 13. The successful contractor will be required to provide two approved sureties of £500 each.

Dec. 17. Rustington.—*Erection of two cottages*, at Rustington, Sussex, according to the plans and specifications prepared by H. G. Heal, surveyor, Worthing and Littlehampton, which can be seen at the offices of E. B. Wannop, Esq., solicitor, Littlehampton, daily, except Saturday, between the hours of 10 and 4. Sealed tenders must be delivered before 4 p.m. on Dec. 17.

Dec. 22. Burnley.—*Erection of proposed technical school* in Omerod Road, Burnley, for the Education Committee. Drawings may be seen and specifications, bills of quantities, and forms of tender obtained at the office of the Borough Engineer, G. H. Pickles, A.M.I.C.E., on payment of £1 1s. Tenders endorsed "Wagon Shed," to be delivered and addressed to the Chairman of the Education Committee, must be delivered at the Town Clerk's Office, Town Hall, not later than 9 a.m. on Dec. 22.

ENGINEERING.

Nov. 30. Aberdare.—*Heating apparatus* for the Higher Standard Schools, for the U.D.C. Education Committee. Plans and specifications may be seen at the office of J. Morris, director, Town Hall, Aberdare, or of T. Roderick, architect, Clifton Street, Aberdare. Tenders, with full particulars of scheme, to be sent to Mr. Morris, duly endorsed "Tender for Heating Apparatus," on or before Nov. 30.

Nov. 30. Ashford.—*Widening of the bridge* over the ditch, Beaver Road, near the sewage pumping station, for the U.D.C., in accordance with the plan and specification, which may be seen on application to W. Terrill, surveyor, at his office, North Street, Ashford, Kent. Sealed tenders, endorsed "Bridge Widening," to be sent to J. Creery, solicitor, clerk, 11, Bank Street, not later than 5 p.m. on Nov. 30.

Nov. 30. Sunderland.—*Supply of four* 350 kw. *rotary converters*, static transformers, and high tension switchgear for the same, for the Corporation. The specification and form of tender can be obtained on application to J. F. C. Snell, M.I.C.E., borough electrical engineer, Town Hall, Sunderland, on payment of a deposit of £1 1s. Sealed tenders, addressed to the Chairman of the Electricity and Lighting Committee, Town Hall, Sunderland, must be delivered not later than 12 noon on Nov. 30. Tenders to be endorsed "Rotary Converters."

Dec. 3. Solihull.—*Supplying and fixing laundry machinery* at the new laundry, for the Guardians at their Workhouse, Solihull, in accordance with plans and specification prepared by W. H. Ward, architect, Paradise Street, Birmingham, where particulars can be seen and all information obtained. Tenders, endorsed "Tender for Laundry Machinery," to be addressed and delivered to F. L. Thompson, clerk to the Guardians, Solihull, not later than 10 a.m. on Dec. 3. Fair wages clause.

Dec. 4. Amsterdam.—*Construction of an iron railway bridge*, with stone substructure, in the bedding of Beersche Maas, the relaying of the railway connections, the demolition of the existing bridge and appertaining works for the railway between Hertogenbosch and Nijmegen, for the Company for Exploitation of State Railways. The cost is estimated at 98,500 fl. (£8,200). Tenders should be delivered at the Central Bureau (Dienst Weg en Werken) of the company, Moreelse Park, Utrecht, before 2 p.m. on Dec. 4. Conditions of contract may be obtained from the Bureau on payment of 2 fl. (3s. 4d.) each.

Dec. 6. Mansura.—*Construction of a road-bridge* with an opening span over the Mansura Canal at Salaka. Tenders will be received at the office of the Inspector of Irrigation, Zifta Circle, Mansura, up to 10 a.m. on Dec. 6. Working drawings are to accompany tenders. Contractors should tender a lump sum for the bridge, including all masonry, stone revetments, earthwork and contingencies. The work to be completed in eight months from the date on which the contractor is notified that he has been given the work. Persons wishing to tender for this work can consult the specification, plan and estimate at the office of the Inspector of Irrigation, Zifta Circle, Mansura. Tenders must be submitted on stamped paper (obtainable from Lieut.-Col. Western, as above).

Dec. 6. London, S.E.—1. *The removal of two externally fired boilers* and one externally fired water-heater, and the supply and erection of two Cornish boilers, steam and feed pipes, pump, hot-well, calorifier, &c., and 2. For the boiler, seatings, flues, building alterations, &c., at the St. George's Workhouse, Mint Street, Borough, S.E., for the Guardians of the Southwark Union, as set forth and described in the specifications and drawings referred to therein, prepared by the Guardians' consulting engineers, the National Boiler and General Insurance Company, Limited, 22, St. Ann's Square, Manchester, from whom copies of the drawings and specifications, with conditions attached, may be obtained on payment of a deposit of £2 2s. Tenders, endorsed "Boilers—St. George's Workhouse," should be addressed to the Guardians, and delivered at Union Offices, John Street West, Blackfriars Road, S.E., by 4 p.m. on Dec. 6., when the tenders will be opened. Fair wages clause.

Dec. 10. Newtownards.—*Construction of a complete system* of waterworks for Newtownards for the U.D.C. The works comprise generally, the driving of about 1,500 yards of tunnel through Scrabo Hill, the construction of a concrete reservoir of 2,000,000 gallons capacity in the Townland of Ballycullen, the laying of an aqueduct and the various distributing pipes throughout the town, consisting of about 16,800 yards of cast-iron pipes, varying in diameter from 10ins. to 3ins., with the supply and fixing of all pipes, valves, meters, hydrants, specials, &c., the construction of a concrete reservoir of 100,000 gallons capacity, in the Townland of Corporation North, and the providing and fixing of pumping engines with all necessary fittings. Plans and specifications may be seen, and a copy of the specification, form of tender and bill of quantities can be obtained upon payment of £1 1s. (which will not be returned) at the office of Swiney & Croasdale, MM.Inst.C.E., engineers, Avenue Chambers, Belfast, on any week day between 10 a.m. and 5 p.m., except on Saturday, when the office closes at 2 p.m. Tenders, endorsed "Tender for Waterworks," to be delivered in sealed envelopes at the office of H. McCartney, clerk to the U.D.C., Town Hall, Newtownards, Co. Down, Ireland, not later than 5 o'clock on Dec. 10.

Dec. 11. Cariño, Spain.—*Execution of port works* at Cariño, Province of Coruña, at the estimated cost of 181,462 pesetas (about £6,659), in accordance with plans, specifications, &c., on view at the offices of the Directorate-General of Public Works, Madrid. A deposit of 1,814 pesetas (about £66) is required to qualify any tender. Local representation is necessary. Tenders will be opened on Dec. 11.

Dec. 31. Ashton-under-Lyne.—*Construction of an embankment*, &c., for the formation of a reservoir, and for other works on and about the Chew Brook, 3½ miles or thereabouts from the Friezland Station of the London & North-Western Railway, for the Joint Committee of the Ashton-under-Lyne, Stalybridge, and Dukinfield (District) Waterworks. Drawings can be seen and copies of the specification, schedule, and form of tender may be obtained at the offices of G. H. Hill & Sons, civil engineers, Albert Chambers, Albert Square, Manchester, and 3, Victoria Street, Westminster, upon receipt of cheque for £5 5s. Sealed tenders, endorsed "Tender for Chew Reservoir and Works," must be addressed to and forwarded to W. H. Rothwell, secretary to the Joint Committee, Town Hall Chambers, Ashton-under-Lyne, on or before Dec. 31.

Jan. 19. Bridlington.—*Supply and erection of two sets* of deep-well pumping machinery, to be driven by steam, suction gas, or electricity, for the Corporation. Copies of specification, forms of tender, and permits to view the site, may be obtained of A. E. Matthewman, town clerk, Town Hall, Bridlington, on payment of £2. Tenders, endorsed "Tender for Pumping Machinery," are to be addressed to the Chairman of the Waterworks Committee and delivered at the Town Clerk's Office not later than Jan. 19.

Feb. 11. Madrid.—*Construction and working of a railway* to connect Santiago de Compostela with the railway from Coruña to Lugo, in accordance with conditions set forth in the "Gaceta de Madrid." A subvention of one-fourth of the estimated cost of construction is offered by the Government, provided the estimate does not exceed 60,000 pesetas (about £2,189) per kilometre. A deposit of 111,205 pesetas (about £4,423) is required to qualify any tender. Local representation is necessary. Tenders will be opened on Feb. 11, at the Ministerio de Fomento, Madrid.

IRON AND STEEL.

Dec. 3. Rotterdam.—*Supply and delivery of 1,000 cast-iron street syphons* weighing about 290 kilos. each. Tenders will be received up to Dec. 3. Conditions of contract (in Dutch) and drawing may be seen at the offices of the Commercial Intelligence Branch of the Board of Trade, 73, Basinghall Street, London, E.C. Local representation is necessary

Dec. 4. Wrexham.—*Supply and erection* of an iron cart-shed at the Willow Road Depôt, for the Town Council. Drawings and specification may be seen and forms of tender obtained at the office of J. England, borough engineer and surveyor,. Tenders, endorsed "Wagon Shed," to be delivered to L. Taylor, town clerk, Guild Hall, not later than 12 noon on Dec. 4.

Dec. 4. India.—*Supply of metals and steel material*, in accordance with the specifications that may be seen at the offices of the Southern Mahratta Railway Company, 46, Queen Anne's Gate, London, S.W. The charge for each specification is £1 1s. Tenders must be addressed to the Secretary, marked "Tender for Metals," or as the case may be, and must reach him not later than noon on Dec. 4.

Dec. 7. Christiania.—*Supply and delivery* of 570,000 "dogs" (rail-spikes), for the Norwegian State Railways. Tenders, in sealed envelopes marked "Anbud paa Dogs," will be received at "Jernbanestyrelsens Expeditionskontor, Christiania," up to 3 p.m. on Dec. 7. Copies of the general and special conditions of tender (in Norwegian) and a sheet of working drawings may be seen, by British traders, at the offices of the Commercial Intelligence Branch of the Board of Trade, 73, Basinghall Street, London, E.C.

PAINTING AND PLUMBING.

Dec. 3. Nottingham.—*Internal cleaning and painting* at the following Council schools:—Bosworth Road; Southwark; Sycamore Road; Clarendon Street; Leen-side; Radford Boulevard for the Education Committee. The whole of the work will require to be completed between Dec. 14, 1906, and Jan. 3, 1907. Specifications, bills of quantities, and forms of tender may be obtained from F. B. Lewis, city architect, Guild Hall, on payment of a deposit of £1 for each school. Sealed tenders, properly endorsed, to be delivered to the City Architect not later than 10 a.m. on Dec. 3. Fair wages clause.

Dec. 4. Halifax.—*Painting work* required to the exterior of Corporation property situate in various parts of the Borough. Specifications, quantities, and forms of tender may be obtained on application to J. Lord, M.I.C.E., borough engineer, Town Hall, Halifax. Tenders, properly endorsed, must be sent to K. Walton, town clerk, not later than 12 noon on December 4. Fair contracts clauses.

Dec. 5. West Hartlepool.—*Painting the interior of several schools* during the Christmas holidays, for the Education Committee. Form of tender, conditions, and specifications can be obtained at the Education Offices, Park Road. Sealed tenders, endorsed "Painting," to be sent to J. R. Smith, secretary, Education Offices, Park Road, on or before Dec. 5.

Dec. 12. Glasgow.—*Cleaning and painter work* required at East Clyde Street Police Station. Specifications and forms of offer may be had on application at the Office of Public Works, City Chambers, 64, Cochrane Street. Sealed offers, marked outside "Offer for Painter Work, East Clyde Street Police Station," must be lodged with A. W. Myles, town clerk, City Chambers, Glasgow, on or before Dec. 12.

ROADS AND CARTAGE.

Dec. 1. Swanage.—*Making-up the following roads* on the Court Park Estate, Swanage, a portion of King's Road, Princess Road, Cecil Road, and Linden Road, for the U.D.C. The works are to be done in accordance with plans, specification, and conditions, prepared by the Surveyor of the Council, which can be seen of T. Randell, clerk, Town Hall, Swanage, between 10 a.m. and noon, on any day except Sunday until Dec. 1. Tenders must be separate for each road, and furnished on forms which can be obtained at the Council Office, and must be sent to the Clerk in a sealed envelope, marked outside "Tender for Making-up Roads on Court Park Estate," before noon on Dec. 1. A deposit of £1 1s. will be required for form of tender supplied.

Dec. 3. Wombwell.—*Supply of the following quantities* of road materials during the year ending Dec. 31, 1907, for the U.D.C.:—750 tons lump dross, best quality; 750 tons 2¼-in. machine-broken dross, best quality, the above to be free from honeycomb and spongy pieces; also 300 tons 3-in. hand-broken blue rock or whinstone. Forms of tenders may be obtained from J. W. Harrison, surveyor to the Council, Town Hall, Wombwell, to whom all tenders, endorsed "Tenders for Materials," together with the samples of the materials tendered for, must be delivered on or before Dec. 3, at 12 noon.

Dec. 3. Handsworth.—*Making Holliday Road*, under the Public Health Act, 1875, Section 150, for the U.D.C. All particulars may be obtained on application to H. Richardson, Assoc.M.Inst.C.E., surveyor to the Council. Sealed tenders, endorsed "Holliday Road," to be delivered at the office of the Surveyor, Council House, Handsworth, Birmingham, on or before Dec. 3. Fair wages clause.

Dec. 4. Radyr.—*Private street improvement works* in Railway Terrace, Radyr, for the Llandaff and Dinas Powis R.D.C., in accordance with specification, which may be seen, and bills of quantities obtained on application to J. Holden, A.M.I.C.E., surveyor, Park House, 20, Park Place, Cardiff. Tenders, sealed and endorsed, to be sent to M. Warren, clerk, Park House, Cardiff, not later than 12 noon on Dec. 4.

Dec. 5. Hove.—*Supply of 4,000 lineal flat granite kerbing*, to be delivered free on the wharf at Aldrington Basin, Shoreham Harbour, or in trucks at Hove Railway Station. Further particulars may be obtained at the office of H. H. Scott, borough surveyor. Tenders on forms supplied, addressed to H. Endacott, town clerk, Town Hall, Hove, and endorsed "Tender for Kerbing," will be received up to 6 o'clock on Dec. 5.

SANITARY.

Dec. 4. London, S.E.—*Erection of a sanitary convenience* at Amersham Road, New Cross, according to drawings and specification, which can be seen at the Borough Surveyor's Office at the Town Hall between 10 and 4; Saturdays between 10 and 1. Sealed tenders, on forms to be obtained at the Town Hall, must be sent to V. Orchard, town clerk, Town Hall, New Cross, S.E., not later than 4 on Dec. 4, and must be delivered in accordance with the Council's regulations which appear on the form of tender. Fair wages clause.

Dec. 11. Wantage.—*Construction of drains* at the Workhouse for the separation of the storm water from the house sewage, in accordance with the plans and specification, which can be inspected at the office of E. B. Ormond, clerk to the Guardians, Union Offices, Wantage, between 10 a.m. and 4 p.m. Tenders for the above work, sealed and endorsed "Tender for Workhouse Drainage," must be sent not later than 10 on Dec. 11.

Dec. 21. Sedgefield.—*Execution of a scheme of main sewerage* and sewage disposal for Bishop Middleham, for the Sedgefield R.D.C. The proposed works in this contract comprise the furnishing and laying of about 2,200yds. of 12, 9, 8, 7, and 6-in. fireclay and cast-iron pipe sewers with Gaskin and cement joints, with manhole and lamphole shafts, storm overflow and screening chambers, bacterial tanks and filters, fencing, cart-road, &c. Contractors desirous of tendering are requested to send their names and addresses. not Tyne, accompanied by a cheque for £3, after which engineers, 3, St. Nicholas Buildings, Newcastle-on-Tyne, accompanied by a cheque for £3, after which ful partilculars and quantities will be forwarded. The engineers will arrange in due course to locally meet the intending contractors and go over the route of the said works and explain plans and specification. Sealed tenders, endorsed "Tender for Bishop Middleham Sewerage," must be sent to J. W. Lodge, clerk, Union Offices, Sedgefield, Ferryhill, not later than 10 a.m. on Dec. 21.

Jan. 7. Stourport.—*Provision, laying and jointing* of cast-iron and stoneware pipe sewers, together with manholes, lampholes and flushing chambers, the construction of task sewer, engine-house, liquefying tanks, distributing carriers, effluent drains, and other incidental works, in accordance with the drawings and specification prepared by the engineers. Drawings and specification may be seen and bills of quantities obtained at the offices of Wilcox & Raikes, engineers, 63, Temple Row, Birmingham, on payment of a deposit of £5 5s. Sealed tenders, in the envelopes supplied, endorsed "Stourport Sewerage—Contract No. 1," to be delivered to C. H. Watson, clerk to the Council, Stourport, not later than 12 o'clock noon on Jan. 7.

No date. London, S.W.—*Reconstruction of drainage* at Kingston Brigade Depôt in the Eastern Command. The plans, specifications, and condition of contract may be inspected at the office of H. B. Measures, F.R.I.B.A., director of barrack construction, War Office, Atterbury Street, Grosvenor Road, S.W., on Nov. 26, 27 and 28, and bills of quantities and form of tender obtained on those days only, on payment of the sum of 10s. (not returnable).

MISCELLANEOUS.

Dec. 3. Sunderland.—*Supply of iron, castings,* wire rope, oils, and other colliery stores, except timber, for the South Hetton Coal Co., Ltd. Forms of tender and specification, with full conditions, may be obtained from J. R. Lambert, South Hetton, Sunderland, and applicants for forms must state the kind of stores for which they wish to tender. Tenders, addressed to the South Hetton Coal Co., Ltd., South Hetton, Sunderland, will be received up to Dec. 3.

Dec. 3. Norwich.—*Supply of the following materials and work* during 1907.—Gravel, flints, &c., paving setts, materials for macadam roads, cement, ironware drainage pipes and fittings, stoneware ditto, British wood, foreign wood, iron, cast-iron manhole covers, gullies, &c., bricks, tar shingle for bottoms, footpath tar-paving and tar-macadam materials, engine fitter, boiler maker, and founder. The necessary specifications, forms of tender, &c., may be obtained of E. Collins, M.Inst.C.E., city engineer, &c., Guildhall, Norwich. Tenders, on the forms supplied, enclosed in envelopes sealed with sealing wax, endorsed "Tender for ——," and addressed to the Chairman of the General Purposes Committee, must be delivered at the City Engineer's office not later than 10 a.m. on Dec. 3.

TOO LATE FOR CLASSIFICATION.

Nov. 29. Heeley.—*Erection of additions* and alterations to the school and outbuildings in Cross Myrtle Road, Heeley, Sheffield. Builders wishing to tender are requested to send their names to A. F. Watson, F.R.I.B.A., architect, 38, Church Street, Sheffield, on or before Nov. 29. Fair wages clause. Tenders will only be received on printed forms and in covers supplied by the Architect.

Dec. 3. Matlock.—*Erection of a proposed new Boarding House,* to be built on land situate at Matlock Bank. Application should be made to D. M. Wildgoose, architect, Edge Road, Matlock, on or before Dec. 3, when, if name be accepted, bills of quantities will be supplied and date when tenders should be sent in.

Dec. 3. Tunbridge Wells.—*Painting and other work* in connection with the Town Hall premises for the Borough Council. Specification and all other particulars may be obtained at the offices of W. H. Maxwell, A.M.I.C.E., borough surveyor, Town Hall. Tenders are invited from persons residing in the Borough. The person or firm whose tender is accepted will be required to enter into a contract and bond with two approved sureties for the due performance of the contract. Tenders endorsed "Painting Work, Town Hall," to be sent to W. C. Cripps, town clerk, Town Hall, Tunbridge Wells, on or before Dec. 3, at 9 a.m.

Dec. 4. Coventry.—*Enclosing the Corridor leading* from the Nurses' Home to the New Infirmary for the Guardians of the Coventry Union. Plans and specification may be obtained upon application to T. F. Tickner, M.S.A., architect, High Street Chambers, Coventry. Tenders to be delivered at the Union Offices, 13, Little Park Street, not later than 3 p.m. on Dec. 4.

Dec. 4. Windsor.—*Making-up, &c., Beaumont Road,* for the T.C. Plan, specification, and general conditions may be seen, and forms of tender obtained upon application at the Borough Surveyor's Office, Alma Road, Windsor. Sealed tenders to be sent in to E. Cecil Durant, Town clerk, 3, Park Street, Windsor, on the form supplied, endorsed "Beaumont Road," not later than 5 p.m. on Dec. 4.

Dec. 5. Burntisland.—*Erection of a sea wall* on the west side of the Harbour and Cromwell's Dyke at Burntisland. Plans and specifications may be seen, and form of tender obtained at the office of John Isles, collector to the Burntisland Harbour Commissioners. Sealed tenders to be sent to the Burntisland Graving Dock Construction Syndicate, Ltd., 31, Lombard Street, London, E.C., marked "Sea Wall, Burntisland," on or before Dec. 5.

Dec. 6. Sheffield.—*Plumbers' and glaziers' work* required for general repairs during the year 1907, for the Education Committee. Specifications and forms of tender, together with cover for same, may be had on application at the Office of the Education Committee, Leopold Street, until Dec. 3, 1906, and sealed tenders, which will only be received on forms and in covers provided, should be sent to J. F. Moss, secretary, not later than Dec. 6.

Dec. 7. London, S.E.—*Supply and erection of wrought iron fencing* at Ruskin Park, Denmark Hill, S.E. Full particulars and information as to the conditions to be observed by tenderers are given in the "London County Council Gazette" of Nov. 26, 1906 (price 1d., or post free 1½d.), which can be obtained from P. S. King & Son, 2 and 4, Great Smith Street, Westminster, S.W. No tender will be received after 10 a.m. on Dec. 7.

Dec. 10. Hitchin.—*Erection of a new boiler shaft* at the Union Workhouse, Hitchin, for the Guardians. A plan and specification can be seen of A. E. Passingham, clerk, Union Offices, Old Town Hall, Hitchin. Sealed tenders, endorsed "Boiler Shaft," to be received by him not later than 10 a.m. on Dec. 10, and such tenders will be opened at a meeting of the Guardians on Dec. 11.

Dec. 10. Alnwick.—*Providing and laying a new main sewer* along the east side of Alnmouth, consisting of 82yds. of 12-in., 321yds. of 9-in., and 42yds. of 6-in. sanitary pipes and accessories, for the R.D.C. The plan, section, and specification may be seen upon application to H. W. Walton, clerk, Alnwick, to whom sealed tenders, endorsed "Alnmouth Sewer," are to be delivered before 1.30 p.m. on Dec. 10.

Dec. 12. Lochgelly.—*Proposed new branch premises,* Lochore, for the Lochgelly Equitable Co-operative Society, Ltd. Plans and specifications may be seen, and all further information obtained on application to J. T. Scobie, architect, Dunfermline and Lochgelly, and sealed tenders to be lodged with J. Mitchell, secretary, at the Society's Offices, on or before Dec. 12, by 5 p.m.

Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, *Great New Street, Fetter Lane, E.C.*

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Cornforth (Durham).—For the erection of new butchering premises, stabling, &c., for the Cornforth Co-operative Society. Mr. H. T. Gradon, architect, Market Place, Durham :—

Stockton Co-operative Society...	£1,403	0	0
Bell & Mann, Cornforth	1,400	12	1
T. Sanderson, Coxhoe	1,389	10	0
L. W. Rowe, Quarrington Hill	1,388	13	9
W. Hall, Gateshead	1,361	9	10
D. Chambers, Washington ...	1,361	0	7
T. Coates, Durham	1,324	0	0
G. T. Manners, Durham	1,319	0	0
W. H. Ayton, Newcastle-on-Tyne	1,300	0	0
Denby & Co., Bristol	1,293	0	0
T. Hilton, Bishop Auckland ...	1,183	0	0
J. Robson, Esh Winning	1,160	0	0
Draper & Sons,* Leamside ...	1,150	0	0

Architect's estimate, £1,200.
* Accepted.

Hull.—For the erection of three shops in Jameson Street, for the Property Committee. Mr. Joseph H. Hirst, city architect :—

Hebblewhite & Wilson...	£2,853	0	0
W. Sanderson	2,850	0	0
Simpson & Sons	2,850	0	0
Jackson & Sons, Witham	2,790	4	0
M. Harper	2,766	0	0
H. T. Arnott	2,751	11	10
Quebell, Son & Greenwood... ...	2,750	0	0
G. H. Panton	2,730	0	0
G. Houlton & Sons	2,715	0	0
T. Goates,* Brunswick Avenue	2,695	0	0

Rest of Hull.
* Accepted.

London.—For the supply of additional electric plant for sub-stations, for the L.C.C. :—

Dick, Kerr & Co., London ...	£8,677	0	0
British Westinghouse Electric & Manufacturing Co.,* London	7,588	7	6

* Recommended for acceptance.

London, N.—For the erection of 10 houses at Tottenham, for the Incorporated Society of Licensed Victuallers. Messrs. Treacher & Son, architects, 73, Moorgate Street, London, E.C. :—

W. Irwin	£3,507
Parrott & Isom	3,355
Rice & Sons	3,131
C. Hale & Co.*	2,775
W. Hawley (withdrawn)...	1,945

* Accepted.

London, W.—For the erection of business premises, Turnham Green Terrace, Chiswick, W., for Arthur Royd, Esq. Messrs. Palgrave & Co., architects, 28, Victoria Street, S.W. :—

Thomas & Edge, Woolwich	£4,198
McLaughlin & Harvey, Brecknock Road, N.	4,053
R. Ward & Son, Battersea	3,900
Henry Smith & Son,* Earl's Court ...	3,585

* Provisionally accepted.

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London, N.—For the erection of Baptist Church at Wood Green. Messrs. George Baines & Son, architects, 5, Clement's Inn, Strand, London, W.C. :—

Est mates	"A" £	"B" £	"C" £	"D" £	s.	d.
H. J. Carter	5,123	272	480	353	0	0
C. North	5,087	256	470	378	0	0
The Co-operative Builders, Ltd.	4,930	283	520	345	0	0
Holliday & Greenwood	4,927	281	493	342	0	0
J. Smith & Sons ...	4,866	234	540	354	0	0
W. Lawrence & Sons...	4,784	227	529	353	0	0
Bywaters & Sons ...	4,617	242	499	368	0	0
Mattock Bros.	4,617	213	463	340	0	0
Kerridge & Shaw ...	4,536	233	456	361	0	0
Battley, Sons & Holness	4,479	227	466	345	0	0
A. Hairhead & Son ...	4,415	225	427	337	0	0
F. J. Coxhead	4,300	211	437	331	17	0
Mattock & Parsons ...	4,275	221	445	353	0	0
H. Knight & Sons * ...	4,275	221	440	345	0	0

* Accepted as regards Estimates "A" and "D," with option of the other estimates.

Ross.—For painting and decorating at new residence at Lowcop, near Ross, for J. M. Newton, Esq. Messrs. Groome & Bettington, architects and surveyors, Palace Chambers, Hereford. Quantities by architects. Third contract :—

	£	s.	d.
Greenlands, Ltd.	£69	5	0
E. W. Wilks	68	0	0
J. C. M. Vaughan *	54	1	10

* Accepted.
(All of Hereford.)

Current Market Prices.

METALS.

		£	s.	d.	£	s.	d.
Standard Copper	per ton	101	0	0	102	0	0
Do. Strong sheets ...	do.	116	0	0	118	0	0
Lead, soft foreign	do.	19	5	0	19	7	6
Do. English	do.	19	10	0	19	17	6
Do. pipes...	do.	22	0	0	22	5	0
Do. sheets	do.	21	10	0	21	12	6
Galvanised Corrugated sheets	do.	13	7	6	13	10	0
Spelter G.	do.	27	15	0	28	0	0
Angles, Scotland	do.	6	12	6	6	15	0
Bars, do.	do.	7	15	0	7	17	6
Marked bars, Staffs. ...	do.	8	7	6	8	10	0
Common bars, do. ...	do.	7	0	0	7	5	0
Angles, M'boro.	do.	6	10	0	6	12	6
Joists. M'boro	do.	6	7	6	6	10	0
Angles, Midlands	do.	6	7	6	6	10	0
Joists do.	do.	6	17	6	7	0	0
Girder plates, Midlands ...	do.	7	10	0	7	12	6
Angles, Foreign, c.i.f. Thames	do.	6	10	0	6	12	6
Tees do. do. do.	do.	6	12	6	6	15	0
Joists, do. do. do.	do.	6	5	0	6	7	6
Channels do. do. do.	do.	6	10	6	6	12	6
Plates do. do. do.	do.	7	5	0	7	7	6
Tin, Foreign	do.	198	0	0	198	10	0
Do. English ingots ...	do.	196	10	0	197	10	0
Zinc, sheets, Silesian, f.o.b.	do.	32	0	0	32	5	0
Do. do. V.M. do.	do.	32	5	0	32	10	0

TIMBER.

		£	s.	d.	£	s.	d.
Deals, Archangel, White, 1st, 3×9	per std.	12	5	0		—	
Do. do. do. do. 3×9	do.	11	10	0	11	15	0
Do. do. do., 2nd, 3×11	do.	11	5	0		—	
Do. do. do. do. 3×9	do.	10	0	0		—	
Do. do. do. do. 3×8	do.	9	5	0		—	
Do. do. do. do. 3×7	do.	8	10	0		—	
Do. do. Yellow, 1st 3×11	do.	21	0	0		—	
Do. do. do. 3rd, 4×9	do.	12	0	0		—	
Do. do. do. do. 3×11	do.	9	5	0		—	
Do. Gamleby, White, unsorted, 3×11	do.	8	10	0	8	15	0
Deals, Kemi, Yellow, 1st & 2nd, 4×11	per std.	10	5	0		—	
Do. do. do. do. 3×9	do.	9	15	0		—	
Do. do. do. do. 3×7	do.	9	15	0		—	
Do. Karlskrona, Yellow, unsorted, 3×9	do.	8	0	0		—	
Do. Munksund, do., unsorted, 3×9	do.	9	5	0		—	
Do. do. do. do. 3×7	do.	8	5	0		—	
Do. Nederkalix Lulea, Yellow, 1st, 4×9	do.	12	5	0		—	
Do. do. do. do. 3×9	do.	11	10	0		—	
Do. Petschora, Yellow, 3rd, dry, 3×11	do.	9	15	0		—	
Do. do. do. 4th, 3×9	do.	8	10	0		—	
Do. Räfsö, do. do. 3×7	do.	8	10	0		—	
Do. do. do. do. 2½×8	do.	8	5	0		—	
Do. do. do. do. 2½×7	do.	9	5	0		—	
Do. St. Petersburg, Yellow, 1st, 3×9	do.	10	10	0		—	
Do. do. do. 3rd, 3×11	do.	7	15	0		—	
Do. do. do. do 3×9	do.	7	15	0		—	
Do. Skutskar, do., 4th, 3×9	do.	8	15	0		—	
Do. Skelleftea, do., 1st, 3×9	do.	10	0	0	11	5	0
Do. do. do. do. 2½×7	do.	10	0	0		—	
Do. do. do. unsorted, 3×4½	do.	9	5	0		—	
Do. Stugsund, do. 5th, 2½×7	do.	7	0	0		—	
Do. Umba, Yellow, 2nd, 3×9	do.	15	0	0		—	
Do. do. do. 3rd, 3×7	do.	9	10	0	10	15	0
Do. do. do. 4th, 3×11	do.	8	15	0		—	
Do. do. do. 5th, 3×9	do.	8	0	0		—	
Do. Wartsala, do. 1st & 2nd, 2½×7	do.	9	10	0		—	
Battens, Blankaholm, Yellow, 1st, 2×7	do.	9	0	0		—	
Do. Hallsta, do. unsorted, 2×5	do.	8	0	0		—	
Do. do. do. do. 2×4½	do.	8	0	0		—	
Do. do. do. do. 2×4	do.	9	5	0		—	
Do. Karlskrona, do. do. 2×9	do.	9	5	0		—	
Do. do. do. do. 2×7	do.	8	15	0		—	
Do. do. do. do. 2×6	do.	8	5	0		—	
Do. do. do. do. 2×5	do.	8	0	0		—	
Do. Munksund, do. do. 2½×6½	do.	7	15	0		—	
Do. Nederkalix Lulea, do. 1st, 2×7	do.	10	5	0		—	
Do. Räfsö, do. 4th, 2×6	do.	8	5	0		—	
Do. do. do. do. 2×5	do.	8	0	0		—	
Do. St. Petersburg, 3rd, 2×4	do.	9	0	0		—	
Do. do. do. do. 1×6	do.	8	15	0		—	
Do. Skelleftea, unsorted, 2×9	do.	8	0	0	8	5	0
Do. Skutskar, do. 4th, 2×9	do.	9	0	0	9	5	0
Do. Umba, do. 1st, 1¼×7	do.	15	0	0		—	
Do. do. do. 3rd, 2×8	do.	10	5	0		—	
Do. do. do. unsorted 1¼×5	do.	10	0	0		—	
Do. Wartsala, do. 1st & 2nd, 2×4	do.	8	5	0	9	10	0
Flooring Boards, Dram, Yellow, unsorted, 1×7½	do.	0	8	9		—	
Do. do. do. do. 1×6½	do.	0	8	6		—	
Do. Fredriksstad, do. 3rd, 1×7	do.	0	10	0		—	
Do. do. do. do. 1×6	do.	0	9	9	0	9	6
Do. do. do. do. 1×5½	do.	0	7	9		—	
Do. do. do. unsorted, 1×5	do.	0	9	0		—	
Do. do. do. do. 1×4½	do.	0	8	6		—	
Do. do. white, 3rd. 1×4½	do.	0	7	6		—	
Do. Skonvik, Yellow, 1st, 1×7	do.	0	12	0		—	
Do. do. do. 2nd, 1×7	do.	0	11	0		—	

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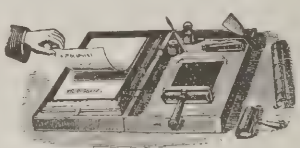
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Coming Events.

Wednesday, November 28.

Edinburgh Architectural Association.—Mr. Nichol Selkirk on "A Practical Talk on Building Stones," at 8 p.m.

Northern Polytechnic Institute (Building Students' Association).—Mr. Hugh Stannus, F.R.I.B.A., on "The Beginnings of Building," at 7.30 p.m.

Institution of Civil Engineers. Students' evening visit to the Great Northern, Piccadilly and Brompton Railway, at 8 p.m.

Friday, November 30.

Architectural Association.—Mr. William Wodward on "The Difficulties which Beset an Architect in London, with special regard to existing legislation and other Controlling Authorities," at 8 p.m. Presentation to Mr. W. G. B. Lewis.

Birmingham Architectural Association.—Mr. W. H. Bidlake on "Some Examples of French Romanesque Architecture."

Glasgow Technical College Architectural Craftsmen's Society.—Mr. John Bowman on "Modern Buildings with Steel Construction."

Institution of Civil Engineers (Students' meeting).—Mr. P. A. Spalding on "Applications of Electricity in Printing Works," at 8 p.m.

Institution of Mechanical Engineers.—Discussion (continued) on "Steam as a Motive Power for Public Service Vehicles," at 8 p.m.

Saturday, December 1.

Royal Sanitary Institute.—Provincial Meeting at Malvern, at 11 a.m. Discussion on "The Area for Sanitary Administration." Mr. W. Osborne Thorp on "Recent Works of Public Health in Malvern."

Junior Institution of Engineers.—Visit to the Great Northern, Piccadilly and Brompton Railway.

Monday, Decmber 3.

Liverpool Architectural Society.—Mr. T. Raffles Davison on "The Art of Drawing."

Architectural Association (Discussion Section).—Mr. Adam Hunter on "Factory Design," at 7.30 p.m.

London Institution.—Mr. George C. Haité, R.I., R.B.A., on "Design and Designers of the Victorian Era," at 5 p.m.

Royal Institute of British Architects.—Business meeting, at 8 p.m.

Society of Engineers.—Mr. W. Polard Digby and Mr. Henry C. H. Shenton on "The Prevention of the Bacterial Contamination of Streams and Oyster Beds," at 7.30 p.m.

Tuesday, December 4.

Society of Designers.—Mr. Hugh Stannus on "The Corinthian Capital."

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—adjudication.]

During the week ending November 23rd twenty-four failures in the building and timber trades in England and Wales were gazetted.

C. Crowe, builder, Tottenham. R.O., Nov. 12.

J. Lawson, builder, Teddington. R.O., Nov. 15.

H. G. Heywood, builder, Hammersmith. Adj., Nov. 13.

E. A. Sparksman, builder, Hammersmith. Adj., Nov. 13.

I. Mann, painter and decorator, Tipton. R.O., Nov. 13.

H. Williams, builder and contractor, Tranmere. R.O., Nov. 15.

J. Bromley, builder and contractor, Knowle. R.O., Nov. 17.

A. Stent, painter and decorator, Wolverhampton. R.O., Nov. 17.

J. G. Moore, contractor, Millwall and West Hartlepool. Adj., Nov. 15.

J. Hadley, brick manufacturer, Rowley Regis. P.E., Dudley C.C., Dec. 6, at 11.

Chapman & Son, plumbers, Uppingham. P.E., The Castle, Leicester, Dec. 14, at 10.

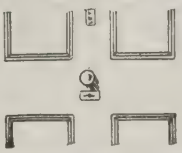
J. B. Harling, joiner, Burnley. P.E., Church Institute, Burnley, Nov. 30, at 10.45. First meeting, same at 12.15.

A. Cooper, contractor, Birmingham. First meeting, 191, Corporation Street, Birmingham, Nov. 25, at 11. P.E., Birmingham C.C., Dec. 20, at 2.30.

Kerslake & Son, builders, Exeter and Okehampton. First meeting, O.R.'s, Exeter, Nov. 29, at 10.30. P.E., The Castle, Exeter, same day at 11.30.

J. F. Wridgway, carpenter and joiner, Kidderminster. First meeting, O.R.'s, Dudley, Nov. 28, at 11. P.E., Town Hall, Kidderminster, Dec. 6, at 2.15.

T. Arnold & Son, builders and decorators, Peckham and New Cross. First meeting, London Bankruptcy Court, Nov. 29, at 12. P.E., same, Dec. 19, at 11.30. R.O., Nov. 13.



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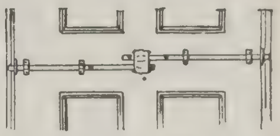

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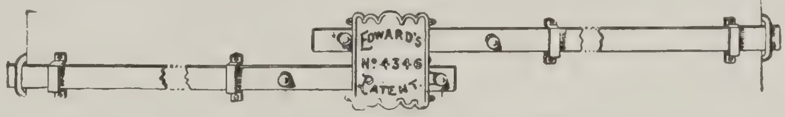

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THE BUILDERS' JOURNAL
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December 5, 1906. **Volume 24, No. 617.**

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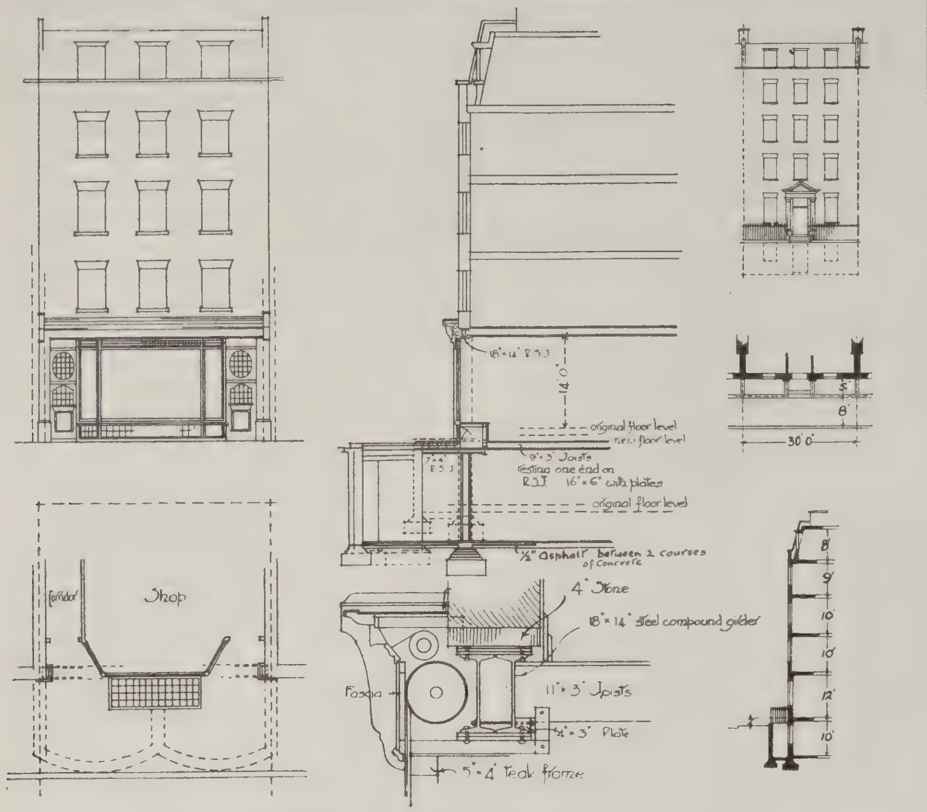
Buildings of the Year. In our issue for December 26th we shall publish an illustrated review of the architectural and building events of 1906. Readers will recollect that we published a similar review last year and in 1904, and we are gratified to know that these annual records were very much appreciated. They are, of course, quite unique in technical journalism. Through our ordinary news channels we are kept informed of what is going on in different parts of the Kingdom, but it is quite possible that there may be buildings of considerable merit which we do not hear of. We shall therefore be very grateful to readers who can let us know of any important buildings in their district which have been completed this year. It may, of course, happen that we already have these buildings on our list, but, on the other hand, we may be enabled to include some interesting examples of work which otherwise we should not be able to give. Will readers therefore kindly send us a card with any information, or, better still, with some photographs of important new buildings completed or begun this year.

St. Paul's: The position at Present. In our issue for last week we dealt with the circumstances which have arisen and have led to fears being entertained as to the danger of the fabric of St. Paul's Cathedral. We expressed the opinion that the building must at no distant date be underpinned, and urged that the work should be commenced at once. Since our issue, further information has been made public by the authorities, and we note that the advisory engineers, Messrs. Barry, Leslie and Co., take the same view as ourselves. A significant paragraph in their report is to the effect that an actual remedy would be found in underpinning the foundations of the whole south side of the structure down to the level of the London clay. This, they agree, would be a costly undertaking, but they suggest that it might be spread over a series of years. Mr. Mervyn Macartney, the architect to the Cathedral, has issued a statement to the effect that the danger is serious and urgent. He says:—"Having now submitted my report on the condition of St. Paul's Cathedral, the Dean and Chapter, in view of the grave importance of the matter, have decided, on my recommendation, to invite Mr. T. E. Collcutt, the president of the Royal Institute of British Architects, Sir Aston Webb, R.A., and Mr. John Belcher, A.R.A., to form a committee of inspection as to the condition and circumstances of the structure. The public may, therefore, be assured that their report and inspection will be an impartial one." The appointing of this independent committee is an entirely wise one. We are not in possession of Mr. Macartney's report, but it is stated that he views the risk involved in the construction of the London County Council sewer more seriously than the engineers, although it appears that the latter are far from half-hearted in objecting to this sewer, for they state in their report that "in view of the possible risk the Dean and Chapter may think it desirable to make representations to the London County Council to endeavour to persuade them to divert the course of the proposed sewer to the south." Further remarks of interest are contained in the engineers' report. "There is no doubt," they state, "that in the past there has been a general movement or 'draw' of the structure to the west and south which is clearly indicated by the evidence of subsidences along the south side of the building. Unfortunately, no exact records have been maintained, and we are therefore not in a position to say how far this 'draw' may be going on (if at all) at the present time. All we can say is that there has been a considerable movement, the south wall of the south transept being $4\frac{1}{2}$ins. to $5\frac{1}{2}$ins. out of the vertical, and the south-west clock tower being 6ins. or more out of the vertical." They further express the opinion that the movement to the west and south is continuous though slow, and they ascribe this, as we have done, to the drainage of the gravel overlying the London clay as the result of modern improvements. They mention that two arches over the west portico have been dislocated, and are now being repaired, but they point out that if, as they believe, the movement is continuous, they can regard repairs as being only temporarily beneficial.

A Municipal College of Arts. We notice that a proposal to establish a College of Fine Arts and School of Decorative Arts and Crafts at Edinburgh, on the Cattle Market site, has been approved by the Edinburgh Town Council. This proposal seems to be an excellent one, and Mr. MacGillivray, R.S.A., who is responsible for it, is to be congratulated. The school is not to reproduce any existing institution, but follows on the lines of some of the best Continental schools, being the outcome of a study of establishments at Paris, Berlin, Brussels, and elsewhere. There can be no doubt that what we particularly want in this country in the matter of architectural and art education is the co-ordination of the instruction given, and a widening of the outlook of each art by being brought into contact with the sister arts. We wish every success, therefore, to this Edinburgh scheme.



ANSWER TO QUESTION 1, SUBJECT VI.

R.I.B.A. EXAMINATIONS.

Model Answers by A. G. Bond, B.A., A.R.I.B.A.

The Final Examination.

(*Concluded from page* 210, *No.* 612.)

Paper VI. — CONSTRUCTION, FOUNDATIONS, WALLS, &C.

[*Not more than four questions to be answered, but question* 1 *must be attempted. Time of examination, three hours and a half.*]

1. — *The accompanying illustrations show part of a dwelling-house fronting a main thoroughfare. Prepare ¼-in. scale drawings showing how you would convert the dwelling-house into a shop. The ground floor must be 14ft. high, having properly-ventilated shop-front with roller shutters and stall-board lights. The basement to be 12ft. high, continued under the street pavement, and to be well lighted, ventilated, and dry, the subsoil water-level being 9ft. below street-pavement level. Also prepare 1in. scale drawings of details, and briefly describe the materials used.*

The processes of construction are briefly as follows.—Strut all windows, set up hoardings, excavate basement under pavement, build outer walls of vaults as dotted on plan, use raking-shores (four in number between windows). Pierce wall for needles and set up dead shores, all shores being taken down to basement floor. Remove brickwork between party walls and insert steel stanchions carried down to new basement level, and set on stone bases on concrete foundations. Put in steel bressummers at two levels shown and underpin to brickwork of front wall over upper ones, and make good. Build brick vaults over basement under pavement, with layers of asphalt over same, and where necessary within thickness of outer walls to keep all dry. Fill up with concrete and prepare for new pavement. Vertical damp-course should be continued as horizontal damp-course in thickness of concrete floor. After leaving to take up bearings, ease wedges of shores and gradually remove same; make good all holes in cement when shoring is removed. ———'s prismatic pavement lights to be used, supported at intervals on 7in. by 4in. steel joists across from joist under stall-board to wall of vault. Construct shop-front, using teak or Honduras mahogany, plate glass, roller blind, steel shutter, granite facing to steel stanchion and for consoles, &c.

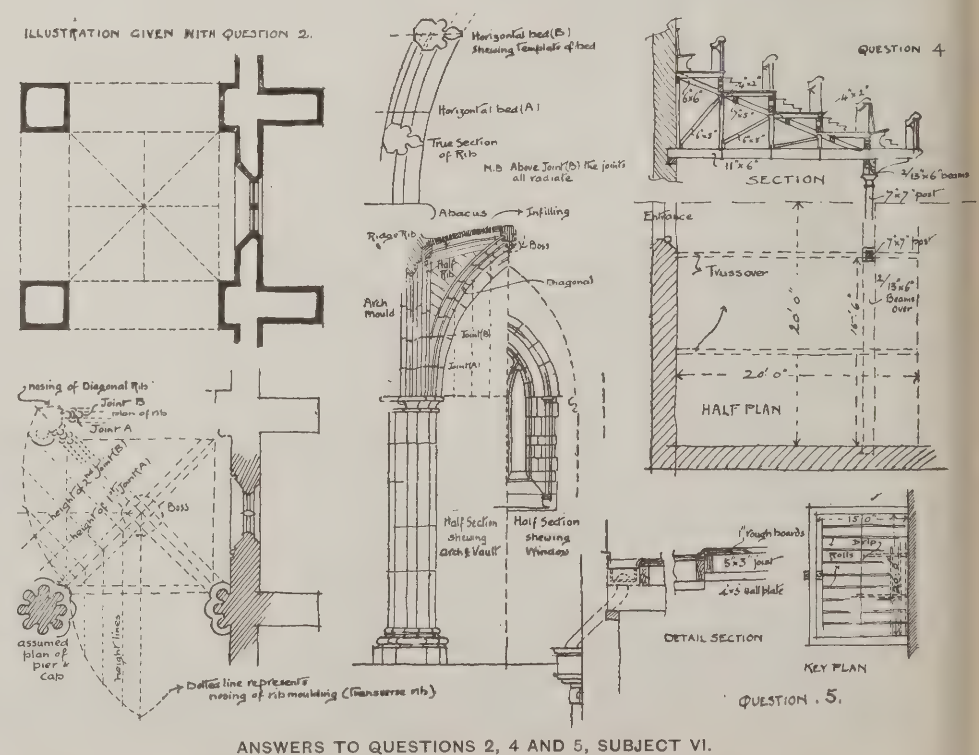
(Such details of the construction could be given as time permitted—the section of the bressummer and positions of steel shutters and roller blind are shown on the accompanying illustrations.)

2.—*Draw ½-in. scale plans, sections and elevations, with templates, showing all stone vaulting, piers and window to one bay of an aisle, as illustrated by the accompanying plan. Describe briefly the principles of the construction. Only half of the window and a quadrant of the vaulting need be shown in detail.*

The principles of construction are briefly as follows :—The pointed arch is used, both for strength and adaptability to the varying spans necessitated by the diagonal and transverse ribs. The rib was introduced in order to lighten the whole construction and at the same time to concentrate the thrust on convenient points of support, such as the piers shown in the illustration. The ribs are the main constructional framework. They are arches formed of voussoirs with radiating joints and loaded with the infilling masonry which forms the actual "ceiling"; the infilling being kept as thin as is consistent with the duty of supporting its own weight over the interval between rib and rib, each being in itself a continuous arch or vault. The vaulting is shown as being slightly "domical" in form, the crown at the centre being higher than the apex of the transverse arches.

3.—*What is reinforced concrete? State its principles of construction, and show by rough sketches its application to floors, walls, roofs, piers, and retaining walls.*

Reinforced concrete is one of many terms applied to a system of construction in which steel is scientifically embedded in concrete in such position, proportion and form that the resulting construction has not only the tensional resistance of steel and the compressional resistance of concrete, but that those properties are even enhanced, while others, such as resistance to weather, shock and fire, are developed, and economy of materials is effected. The principle of construction is so to arrange the steel that it will most effectually, and at the same time economically, relieve the concrete of almost all tensional stress in whatever form that stress may arise—*e.g.*, shearing, torsion, buckling and splitting, &c.—and so to arrange the concrete that it will relieve the small steel reinforcing members of all undue compressional stress and at the



ANSWERS TO QUESTIONS 2, 4 AND 5, SUBJECT VI.

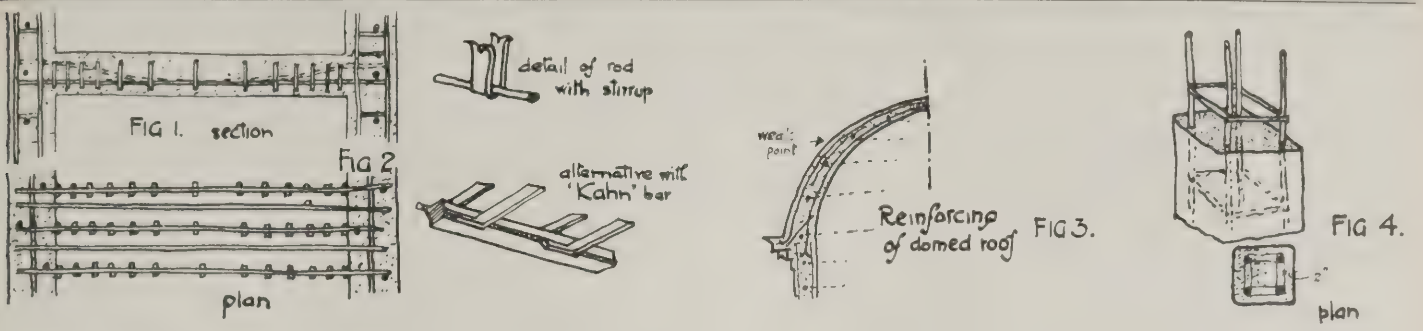


FIG 1. section
Fig 2
plan
detail of rod with stirrup
alternative with 'Kahn' bar
weak point
Reinforcing of domed roof
FIG 3.
FIG 4.
2"
plan

ANSWER TO QUESTION 3, SUBJECT VI.

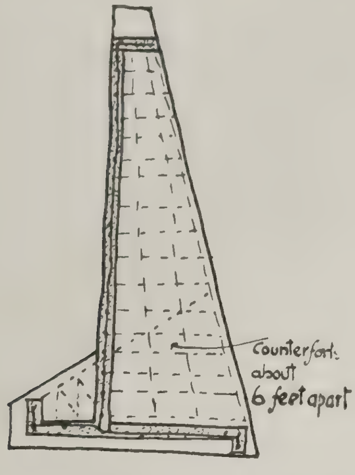


Fig 5.

same time thoroughly protect the steel from weather or possible exposure to fire. The accompanying sketches illustrate its application to floors (Fig. 1), walls (Fig. 2), roofs (Fig. 3), piers (Fig. 4), and retaining walls (Fig. 5). It will be seen that in each case the above-mentioned principles regulate the design of the reinforcing.

(N.B.—In the short time available, only such rough sketches as those shown could probably be given. Many other examples of the use of reinforced concrete will be found in THE BUILDERS' JOURNAL "Concrete and Steel Supplement.")

4.—*Draw to ½-in. scale a plan and section of a wooden gallery, 40ft. wide by 20ft. deep, to a church. No constructional ironwork is to be used and all dimensions of the various parts are to be given.*

A practical method of constructing this gallery would be by means of half trusses of "Princess-post" type placed about 8ft. apart and carried at one end on the back wall and at the other end on beams which are in turn supported partly on the side walls and partly on two-storey posts, as shown by the half plan. The strength of the various parts could be calculated by means of a reciprocal diagram and the usual formulæ if time permitted, allowing a load of from 1½ to 2 cwts. per ft. super. all over, but approximate sections are all that an examiner would expect. The purlins could be arranged on the back of the principals, with a light framework at the riser of each pew to support the small joists carrying the floor. The construction only is shown: architectural treatment could hardly be considered in the time at the candidate's disposal.

5.—*Draw to ½-in. scale a plan of a lead flat over an outbuilding, 20ft. by 15 ft., enclosed on three sides by parapet walls. The fourth side is the flank wall of the main building. The only connection to the drain is through a manhole opposite the centre of the 20ft. external wall. Give a section through the flat and through the gutter, and state the weights of the lead you would suggest.*

Only a key plan is given, as the construction is simple. As the boarding should run in the direction of the fall, it will be best to divide the plan up, as shown by dotted lines, with two binders 10ins. by 6ins. about 7ft. apart, and 5-in. by 3-in. joists 1ft. apart. The binders and wall-plate could be placed slightly out of the horizontal so as to give a fall of 1½ins. or 2ins. in 10ft. One drip would be sufficient: a detail is given of the drip and gutter and the lead-lined cesspool.

Subject VII.—CONSTRUCTION IN IRON AND STEEL: SHORING, UNDERPINNING, AND DEALING WITH RUINOUS AND DANGEROUS STRUCTURES.

(*Time of examination, three hours. Maximum number of marks,* 125.)

1*a*. There is a row of warehouses, 50ft. deep, out to out, and 15ft. frontage, centre to centre, each. It is desired to unite the centre pair on *the ground floor* by the removal of the party wall which carries the 14-in. thick brick wall over, and insert steel girders in lieu of the wall, the girders carried on stanchions. The warehouses consist of ground floor 12ft. high, first and second floors 10ft. high each, all floor to floor, and the top or third floor 9ft. high in clear. The floors in all cases are carried on 9-in. by 3-in. wooden joists running from party wall to party wall, and the roof is of 10-ins. of concrete (average thickness) covered with asphalt. The parapet between the buildings is 3ft. above the top of the asphalt. Sketch section of party wall and girder to ¼-in. scale.

b. Assuming the party wall a sound one, how do you proceed to remove the ground-floor wall? Give sketches explanatory of the work to be done.

c. What is the total weight the girders will have to carry, assuming the warehouse floors have to bear a weight safely of 2½ cwts. to the foot, including the floor itself?

d. The girders rest on the front and back wall at either end, and on two stanchions between the external walls, forming three equal openings between the front and back walls. Give one-quarter-full-size section of girders, and figure the dimensions.

e. Calculate the horizontal plan and section of each stanchion. Draw same quarter-full-size, figuring all parts. State whether you intend the stanchion to be steel or cast-iron in your sketch.

f. Draw to quarter-full-size elevation of the head of the stanchion, and elevation of the girders immediately over one stanchion: the girders to be in three lengths, meeting over the heads of the stanchions.

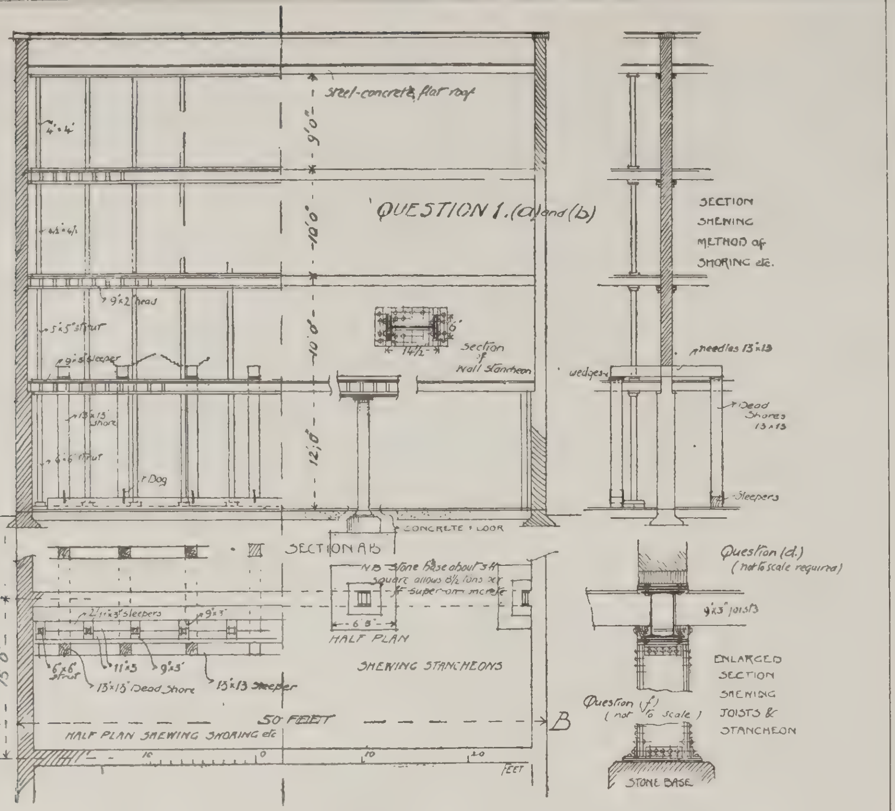
g. If the front wall is at all insecure from bulges or cracks, how would you support it during the insertion of the girders, and afterwards?

See illustrations on next page.

(The thicknesses of walls are as given in the question; they are not according to the Building Act nor the Model By-Laws.) This question shows the importance of reading through the whole paper before attempting the answer to any question, as it is only when the candidate comes to question (*d*) that it is made clear how the girder is divided up by stanchions and, consequently, what proportion of the total load each girder and stanchion has to bear. As there are two intermediate stanchions (see plan) it would be quite possible to deal with each third part of the party wall as a separate piece of shoring and underpinning, and, other things being equal, this would certainly be the safest plan to adopt. Again, it is often a question what proportion of the total superstructure is really carried by a bressummer. In a long continuous wall in which an opening has to be made it may often be the case that, with the exception of a portion of the brickwork within an angle of about 60 degs. between stanchion and stanchion, no weight at all will ultimately be carried by the girder spanning the opening, owing to the adhesion of mortar and the sound bonding of the bricks, but in this case, as the whole wall is to be taken away on the ground floor, it would hardly be safe to count on the support of the external walls to hold up any appreciable portion of the party wall, either during the operations or after they are complete, and as it might well be a matter of importance that the whole work should be carried out in one operation in order to save time, the first consideration may also be disregarded in answering this question.)

(*b*) It is here assumed, therefore, that the whole superincumbent load is to be borne by the girders and the four stanchions, and also that the whole of the party wall has to be shored up and the alteration carried out in one operation. The illustration shows the method suggested for the shoring or temporary support. First the floors which are directly carried by the party wall are strutted up by timbers varying from 6ins. by 6ins. on the ground floor to 4ins. by 4ins. on the top floor, standing on sleepers or sole-pieces 9ins. by 3ins. (further spread on the ground floor to prevent possible damage) and with head-pieces under the joists 9ins. by 2ins. (N.B.—In dealing with a party wall so slender in proportion to its height it might be advisable to use flying shores from party wall to party wall on the two floors above the ground floor, on both sides of the wall in question, but the support of the floor joists resting on these walls is here assumed to be sufficient.) Next the walls have to be needled and the dead shores set up: these have now only the weight of the walls to carry—not a very serious matter, as, if the shores are placed about 6ft. apart, centre to centre, the weight of the brickwork on each would be approximately 30ft. × 5ft. × 1⅙ft. × 1 cwt. (per ft. cube) = 175 cwts., while the needles shown (13ins. by 13ins.) would easily carry a heavier load.

The part of the question (*g*) shows that a further shoring might be rendered necessary owing to the insecurity of the front wall: temporarily it would be possible to make it secure by a system of raking shores, but for permanently securing it something better will be needed, and if done in the first instance would obviate the necessity of the raking shores. The process referred to would be the use of iron rods and face-plates; the rods would pass close to the underside of the joists; the process is further described under (*g*). (N.B.—The method of removing the shoring might then be de-



ANSWER TO QUESTION 1, SUBJECT VII.

scribed shortly, but the question does not really require this.)

(*c*) We now come to the calculations for the permanent work. As at first stated, we assume that the whole weight of wall, floors and roof is carried by the girders, each of which carries one-third of the total. The wall is 48ft. by 33ft. by 1⅙ft., or has a total cubical measurement of 1,848 cub. ft., which will weigh, approximately, 90 tons. The weight of the roof may be taken as the same as for floors (it might be used for stacking goods), so that, as half the weight of each floor on both sides comes on the party wall, the total weight will be $\frac{4 \times 15 \times 48 \times 2\frac{1}{2}}{20}$ tons $= 360$. Therefore the total load will be 450 tons, which will give 150 tons on each girder. The span of the girders (assumed to be a pair of rolled steel joists with plates) is approximately 16ft. As the load is taken at its maximum, a factor of safety of 3 is sufficient. Making use of the formula $W = \frac{CAD}{L}$ and with a constant of 10 for breaking weight at the centre $\left(\text{or } \frac{10 \times 2}{3} = 6\frac{2}{3} \text{ safe distributed load}\right)$ and assuming that depth is 16ins., as the load is a heavy one, we get

$$A = \frac{W \times L}{C \times D} = \frac{150 \times 16 \times 3}{16 \times 20} = \frac{45}{2}.$$

Now the width should be about 14ins.; hence the thickness of the flanges and plates should be $\frac{45}{2} \times \frac{1}{14} = 1{\cdot}6$, or say 1¾. Then if the average thickness of flange is ¾in., two ½in. plates are to be added. The depth is to be 16ins.; therefore two 14in. by 6in. joists will do—the plates being say 14½ins. wide. (As a low factor of safety has been taken, the effective area of webs—one-sixth—has been neglected in the above calculations.)

(*d*) A sketch is given with the illustrations, but not to scale: the candidate would, of course, draw it to the scale required.

(*e*) The stanchions will be calculated to carry loads as follows:—The two end ones each take ⅙th of the total, the two intermediate ones each take ⅓rd of the total. It will be sufficient to calculate one of the end ones, and to use a pair of similar ones at each of the intermediate points. The weight of girders can be disregarded. Metal assumed to be rolled steel I section; height of stanchion, 12ft.; smaller cross dimension, $\frac{1}{24}$th of height = 6ins.; load to be carried $\frac{450}{6} = 75$ tons; allowance of safe load for the proportion of height to least width assumed, say, 4 tons per sq. in.; required area of metal in sq. ins., $\frac{75}{4} = 19$; longer dimensions of stanchion to be 14½ins. to suit width of girder over. Taking web as ½in. thick, and approximately 12ins. long between flanges, we get an area of 6 sq. ins. in the web, leaving $19 - 6 = 13$ sq. ins. to be provided by flanges, which, if made 1¼ins. thick (including the plates) will each have a sectional area of 7½ sq. ins., giving a total of 21 sq. ins., which will be ample for the purpose. (This result could be checked by the use of Gordon's formula if time permitted. Find the breaking weight from the dimensions assumed; the result divided by the load to be carried will show what factor of safety we have allowed.) In order to complete the sketches it would be well to assume the nature of the subsoil—say, hard clay—and allow, say, 2 tons per ft. super. for safe loading: this would give an area at base of concrete under intermediate stanchions of about $\frac{76}{2}$, or 38ft. super, or about 6ft. 3ins. square.

(*f*) The answer to this question is only suggested by small scale sketches, as numerous examples of a similar kind are to be found in the back numbers of this Journal.

(*g*) The cause of either defect in the wall should be ascertained and, if possible, removed or minimised. In this case, as no weights come on the front wall from floors, &c., the cause is probably bad brickwork or insufficient thickness: an inadequate proportion of headers might cause the wall to divide vertically. Bulges might be prevented from becoming worse both temporarily and permanently by means of iron rods passing through the building from back to front, and passing through plates at convenient intervals on face of front and back walls, with threads at the ends and screw-nuts and washers: the iron rods would be heated and the screws then tightened, so that the contraction on cooling would tend to draw in the bulging parts of the wall. If the wall is found to be divided vertically into two parts it might be advisable to draw occasional bricks and insert new headers in blue brick in cement, and, previously, to utilise the holes thus made for pouring in liquid cement grouting.

Cracks might be due to several causes—for instance (1) settlement of part of the wall owing to insecure foundations (this could only be remedied by underpinning); (2) outward pressure from floors or roof (apparently it is not so in this case, but if it were so there would probably be corresponding bulges at the points of pressure, and the remedy is given above); (3) parts of the wall might have settled more quickly than other parts and thus have caused cracks (the remedy would be to draw all the snapped headers and insert new ones in cement); (4) cracks in such a case would possibly be due to the weight of concrete flat partly resting on a wall of great height without any intermediate ties, as all the floor joists rest on the party walls.

[*Answers to the questions set in the Intermediate Examination were given in our issues for July 11th, July 25th and August 8th last, and to Subjects I., II., III., IV. and V. of the Final Examination in the issues for September 5th, September 26th, October 17th and October 31st.*]

Obituary

The late Mr. Joseph Elliot, builder, contractor, and quarry owner, of North Shields, who died on September 5th, left estate which has been proved at £50,219 gross.

Mr. Arthur Smith, borough surveyor, of Dartmouth, committed suicide last week, as the result of certain financial irregularities in his department.

Mr. H. A. Prothero, M.A., F.R.I.B.A., the well-known ecclesiastical architect and authority on Gothic, died in Cheltenham on November 25th in his 58th year. Mr. Prothero was educated at Cheltenham College and Balliol, Oxford. He designed the new chapel at Cheltenham College, was architect for the Cheltenham Ladies' College, and designed additions to many churches in Cheltenham and neighbourhood; also new churches in various parts of the country.

A new Street Improvement Plan for Newcastle-on-Tyne was outlined by Mr. J. T. Cackett, F.R.I.B.A., in his recent presidential address to the Northern Architectural Association. It is to Mr. Cackett's address last year that Newcastle practically owes the present scheme for developing the New Bridge Street area. Mr. Cackett now extends his former plan for the utilisation of the lower area and the linking up of Mosley Street with New Bridge Street.

THE ARCHITECTURAL REVIEW.

"The Architectural Review" for December is a particularly interesting issue. The new War Office in Whitehall is illustrated by sixteen photographic views, together with plans of the building, and a descriptive article by Mr. Clyde Young, who has carried to completion the design of his father, the late Mr. William Young, F.R.I.B.A. Another interesting feature of the issue is an article on the Churches of Sicily by Mr. Ronald P. Jones, M.A., while Mr. A. C. Champneys gives a further instalment of "Irish Ecclesiastical Architecture." The "Exemplar" this month comprises Gothic canopies, and "Current Architecture" is represented by eleven views of a large house at Farthingstone, Northants, by Mr. Walter Cave. Some most commendable students' designs done in the Architectural Association School of Architecture also add to the interest of the issue.

R.I.B.A.

A business meeting of the Royal Institute of British Architects was held on Monday evening at 9, Conduit Street, W.

The following were elected :—

As Fellows (77).

W. Adamson (Cape Town)
G. L. Beattie, A.M.I.C.E. (Edinburgh)
George Bell (Glasgow)
Edward M. Blake (Wellington, N.Z.)
J. H. Blizard, A.M.I.C.E. (Southampton)
Detmar J. Blow (London)
Cecil C. Brewer (London)
W. L. Trant Brown (London)
R. M. Butler (Dublin)
W. H. Dashwood Caple (Cardiff)
F. J. C. Carruthers (Dumfries)
M. E. Collins (London)
A. S. Conrad (Adelaide)
William Cooper (Huddersfield)
W. M. Cowdell (Leicester)
H. Bulkeley Creswell (London and Rugby)
W. Crichton (Wellington, N.Z.)
James Davidson (Coatbridge)
W. L. Eves (Uxbridge)
J. Fasnacht (London)
W. J. Fennell (Belfast)
H. W. Finch (London)
E. W. Fritchley (Bombay)
J. G. Gillespie (Glasgow)
George W. Hamilton-Gordon (Bloemfontein)
Claude Harrison (London)
F. M. Harvey (London)
P. L. Henderson (Edinburgh)
R. A. Hinds (London)
G. S. Hudson (Durban)
A. R. Jemmett (London)
W. J. Kemp (London)
Sydney D. Kitson (Leeds)
W. G. B. Lewis (London)
J. H. McKay (Wellington, N.Z.)
J. C. McKellar (Glasgow)
C. R. Mackintosh (Glasgow)
W. H. McNab (Glasgow)
Duncan McNaughtan (Glasgow)
A. Macpherson (Edinburgh)
[illegible]. Macwhannell (Glasgow)
H. E. Mathews (East Grinstead)
S. J. May (London)
Graham Nicholas (Halifax)
W. T. Oldrieve (Edinburgh)
J. W. Paton (Durban)
J. P. Pritchett (Darlington)
E. K. Purchase (London)
Walter Reid (Johannesburg, Cape Town and Bloemfontein)
David Robertson (Edinburgh)
W. W. Robertson (Edinburgh)
James Salmon (Glasgow)
J. Simpson (Bolton and Liverpool)
E. W. Sloper (Johannesburg)
A. P. Small (Ross)
A. Dunbar Smith (London)
A. Steinthal (Manchester)
Harold Sudlow (Calcutta)
Alfred Swash (Newport, Mon.)
H. Ramsay Taylor (Edinburgh)
Isaac Taylor (Manchester)
Sir Alfred Brumwell Thomas (London)
R. W. Thomas (Llandrindod Wells)
J. Baird Thomson (Glasgow)
W. A. Thomson (Glasgow)
G. A. Troup (Wellington, N.Z.)
W. J. Waghorne (Calcutta)
W. S. Walker (Hull and Bridlington)
W. T. M. Walker (London)
John Waterson (Johannesburg)
John Watson (Edinburgh)
W. F. Wilkie (Dundee)
J. Leonard Williams (London)
C. L. Wilson (Cardiff)
G. E. Withers (London)
E. Woodhouse (Manchester)
P. Scott Worthington (Manchester)

As Associates (57).

Dennis Bamford (London)
H. Blackadder (London)
A. G. Bray (Blackburn)
A. E. Brooker (London)
W. W. J. Calthrop (London)
H. R. Coales (Leatherhead)
A. Bulloch (London)
O. H. Cockrill (Great Yarmouth)
T. H. O. Collings (Brighton)
W. H. H. Cooke (London)
R. W. A. J. Cosway (London)
H. B. Downs (Guiseley)
C. W. Eaton (Bolton)
E. H. Edleston (Nantwich)
G. A. Farrar (Manchester)
F. H. Fitzgerald (London)
F. J. Forster (London)
F. B. Foster (Weston-super-Mare)
J. B. Fulton (London)
E. H. Gandy (Wolverhampton)
L. M. Gotch (London)
A. C. Goulder (London)
J. W. Hepburn (London)
G. B. H. Hoole (London)
P. C. Hoy (Manchester)
F. J. Humphry (Surbiton)
D. B. Hutton (Glasgow)
E. T. Jago (London)
E. R. Kennedy (Belfast)
C. C. Makins (London)
H. J. C. Marshall (London)
H. Moss (Bolton)
S. Moss (Liverpool)
J. E. Mundell (Poole)
H. F. Murrell (London)
J. Newton (London)
J. Parlett (London)
S. H. Penlington (Bristol)
G. E. Phillips (London)
H. A. Rowbotham (London)
J. Rycroft (Bradford)
W. P. Rylatt (Leeds)
J. P. Salwey (London)
V. G. Santo (Shrewsbury)
W. P. Schofield (Leeds)
H. Shackleton (Keighley)
J. Smith (Glasgow)
F. A. Sprules (Sheffield)
F. G. Stockdale (London)
C. R. Thickpenny (Watford)
W. I. Travers (London)
E. H. Walker (London)
Ewart G. Walker (London)
B. M. Ward (Birkenhead)
Bryan Watson (London)
B. C. Westwick (Mansfield)
A. Woodeson (Colombo)

Admission of Candidates to Fellowship.

The chairman brought forward a proposal, on the suggestion of the Council, that, pending the settlement of the larger questions involved in the revision of the Charter and By-laws of the Institute (suggested by the Registration Committee and adopted in principle by the General Body, but referred to the Council for a report), they continue to act under the old By-law No. 3—relating to the admission of candidates to Fellowship—(it not having yet received in its amended form the sanction of the Privy Council) until such time as all changes may be made together, the Council undertaking in the meantime to act in accordance with the spirit of the proposed by-law until it comes regularly into force.

We understand it was eventually resolved that the date "December 31st, 1906," in the resolution of February 29th, 1904, should be extended to December 31st, 1907. This, presumably, gives another year of life to admission to Fellowship under the present regime.

Rural Building By-Laws.

Mr. Lacy W. Ridge, F.R.I.B.A., moved: "That the Royal Institute of British Architects is of opinion that the provisions of 'The Public Health Act (Building By-laws) Bill, 1906,' which has already passed the House of Lords and is now sent to the House of Commons, will, when enacted, prove advantageous in facilitating building operations in rural districts." This was agreed to.

Public Officials acting as Architects for Public Buildings.

Mr. Herbert W. Wills, A.R.I.B.A., moved "that the Royal Institute of British Architects considers it inadvisable in the interests of architecture that public officials should act as architects for public buildings." This was agreed to, with the addition of the words "unless they have had an architectural training." A second motion by Mr. Wills on the same subject was withdrawn. It was as follows: "That the Council of the Institute should obtain statistics of the sums paid to official architects, surveyors and engineers and their staffs, with a view to instituting a comparison between such sums and the fees which would be paid to outside architects for similar work, in order that, if the latter charges compare favourably with the former, they should approach those public bodies who already employ, or are contemplating employing, officials, with a view to securing the abandonment of such a system."

Notes on Competitions

Holborn Municipal Buildings.

It will be recollected that a competition was held this summer for new municipal buildings for Holborn, to be erected adjoining the free library. Messrs. Warwick & Hall were the successful architects; their design was given in our issue for July 18th. Since the decision of the competition, however, a protest against the scheme has been engineered by the members of the new Council, and at a special meeting on Wednesday Councillor Chapman brought forward a motion to rescind all resolutions on the matter. He estimated they could save the ratepayers £20,000 by the adoption of an alternative scheme. The contractor, the architects, and other officials could be compensated. This proposal, however, was defeated by a large majority.

Partington Convalescent and Nurses' Home, Glossop.

In addition to the first three designs, the following received special mention in the assessor's award:—Mr. Stuart M. Mould, Newcastle-upon-Tyne; Mr. C. Worby Beaumont, London; Mr. J. A. Minty, London; Mr. J. J. Wood, Leeds.

London County Hall.

At last week's meeting of the London County Council the Establishment Committee recommended that, in respect of the eight architects who are to be invited to compete for the new County Hall with the architects (not fewer than 10 nor more than 15) selected in the preliminary competition, the time for sending in their designs should be extended to the date for the final competition, instead of the date for the preliminary competition, as first suggested; this in order to give them more time to do justice to their work. The Council approved the recommendation.

A Prize Scheme.

At the recent smoking concert of the associates' section of the Edinburgh Architectural Association particulars of a prize scheme were circulated. We extract the following:—

General Conditions.—All designs to be sent in under a motto unknown to the competitor. Conscientious objectors need not compete in the Gothic competition. Those entering for the competitions must use these conditions as a coupon—the competitor having the greatest number of coupons will be adjudged the winner. The committee cannot guarantee the winner receiving his prize money, as the treasurer has done the same thing before. The drawings to be executed slowly on the inside of the paper.

A—Design for a Country Mansion for an Architectural Draughtsman.—Cost not to be less than £50,000, at 4d. per cubic foot. *Accommodation required.*—Mainly smoking-rooms ensuite. The drawing-room to be made as stuffy as possible, in order to give a homelike feeling. *Drawings required.*—Plan of butler looking up, full size. Drain plan showing mantraps. The competitor must consider the advisability of changing the design into a municipal art school. The planning, however, will be the same in both cases. *Prize.*—100 vols. of the Association's "Transactions."

B—Design for a Gothic 14th century psuedo-peripteral Shop Front, with portico in several antis.—Drawings required.—Plans showing how you did it. The designs should be according to the principles laid down by Goodnewyear in his "Mental Afflictions."

C—Prize for Apprentices. Design for a "Draughtsman's Crib" in the "modern mean style."—Drawings required.—Full-size detail of a cheque.

A new School at Maidstone.

We notice that at the last meeting of the Maidstone Town Council considerable discussion arose in regard to the new school which it is proposed to erect in the borough. Plans had been drawn up by the borough surveyor, and the committee in charge of the matter recommended that these plans should be adopted, urging the old fallacious argument about not spending the ratepayers' money by putting the work in the hands of "an architect who would charge 5 per cent." We are glad, however, that one councillor was well-informed enough to point out that he did not see where the saving would be effected, and he expressed the opinion that if they had the services of local architects they would get a choice of plans, and, perhaps, a better one than the surveyor could prepare, for the same amount—if not for less. At the last meeting of the committee an amendment was proposed inviting local architects to send in plans, but it was lost by one vote. The mayor said he did not wish to say one word against architects, "but they were as a rule somewhat extravagant in their business and that had to be paid for. . . . By employing their surveyor there would be a saving of £300 of the ratepayers' money in architect's fees at 4 per cent., and there would, he believed, be a saving of something like £1 per head per child in the erection of the school, which would mean a sum of £600 to £700." Eventually 8 aldermen voted for the work being placed in the hands of the borough surveyor and 8 for the work being given out to a local architect. The mayor gave his casting vote in favour of the former arrangement, so it is now definitely settled that there shall not be any competition for the school.

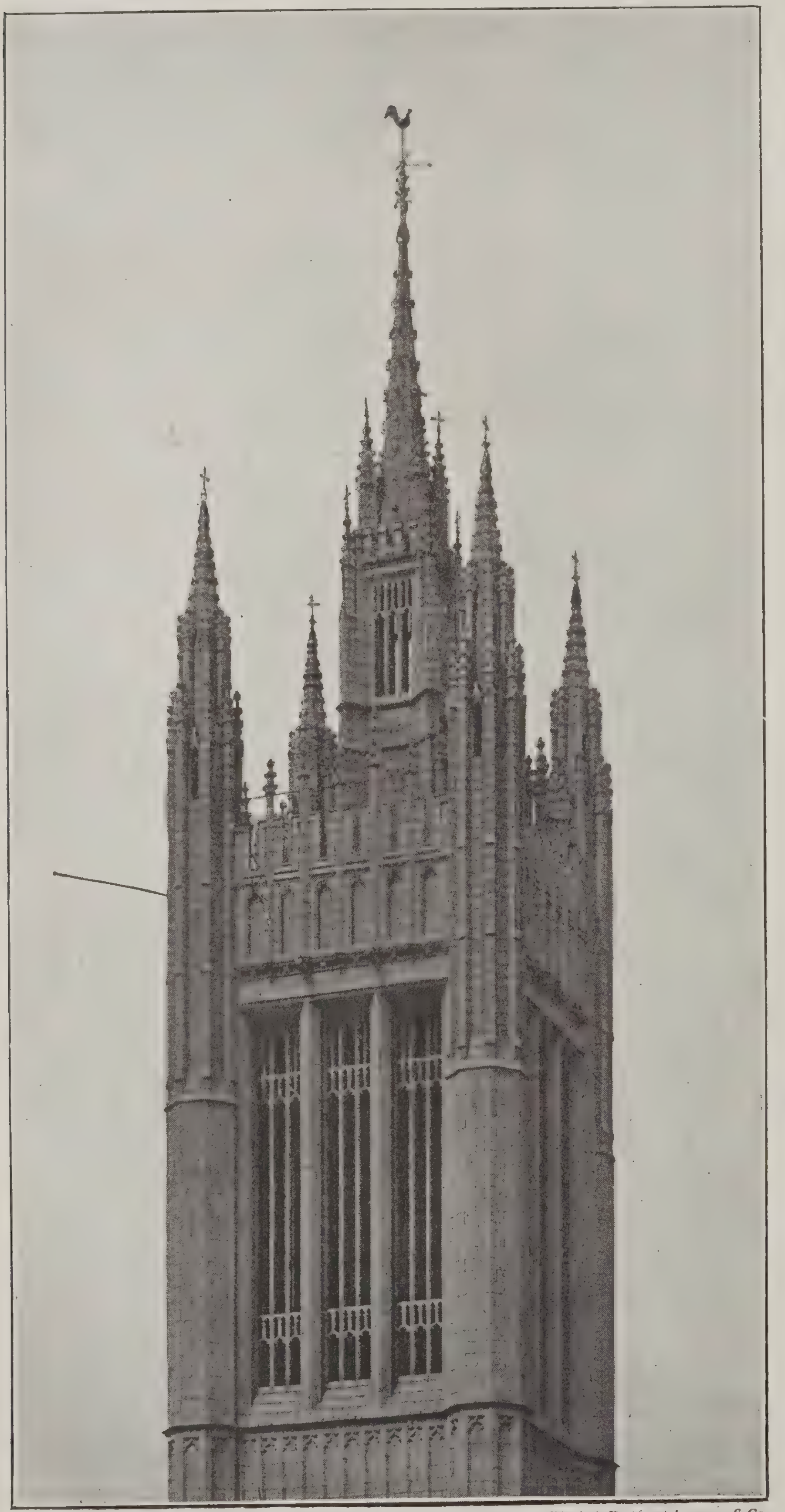


Photo: Bedford Lemere & Co.

THE UPPER PART OF THE TOWER OF MARISCHAL COLLEGE, ABERDEEN.
A. MARSHALL MACKENZIE AND SON, ARCHITECTS.

New Baths at Sheffield.

In the competition for new public baths to be erected at Primrose Meadows, Sheffield, seventeen designs were submitted. The assessor, Mr. J. Lane Fox, of Leeds, has made the following award:—1st, No. 8, by Mr. A. Nunweek; 2nd, No. 14, by Messrs. Charles M. Hadfield and Son; 3rd, No. 9, by Messrs. Potter and Sandford—all of Sheffield.

List of Competitions Open.

Deposit for conditions given where known.

DATE OF DELIVERY	COMPETITION.
Dec. 31	LABOURERS' COTTAGES AT DUBLIN.—Premiums of £50, £30 and £20. Particulars from A. R. Barlas, secretary, L.G.B. Offices, Dublin. No deposit.
Dec. 31	DUAL SECONDARY SCHOOL AT GOOLE.—Premiums £50 and £25. Particulars from James W. Johnson, clerk to Governors, Council Offices, Goole. Deposit £2 2s.
Dec. 31	NURSES' HOME AT GENERAL HOSPITAL, WOLVERHAMPTON.—Particulars from J. Stephen Neil, House Governor and Secretary, General Hospital, Wolverhampton. No deposit.
Dec. 31	BATHS AT ASHTON-IN-MAKERFIELD.—Limited to architects in Wigan and Leigh Poor Law Unions. Particulars from A. Sykes, clerk, Council Offices, Ashton-in-Makerfield. No deposit.
1907 Jan. 12	LAY-OUT OF RIDDRIE ESTATE, GLASGOW.—Premiums of £75, £50 and £25. Particulars from A. W. Myles, town clerk, City Chambers, Glasgow. No deposit.
Jan. 19	LIBRARY AT PLYMOUTH.—Premiums £50, £30 and £20. MUSEUM AND ART GALLERY AT PLYMOUTH. Premiums £25, £20 and £10. Limited to local architects. Particulars from Borough Librarian, Plymouth.
Feb. 1	CHILDREN'S HOSPITAL AT SUNDERLAND.—Premiums of £100, £50 and £25. Particulars from T. Robinson, secretary, Infirmary Offices, Bank Buildings, Sunderland. Deposit £1 1s.
No date.	CONGREGATIONAL CHURCH, SCHOOL AND MANSE, GRIMSBY.—To cost £8,200. Premiums of 25, 15 and 10 guineas. Particulars from E. L. Bridge, Fish Docks, Grimsby. Deposit £2 2s.

Our Plates

House at Shortlands, Bromley.

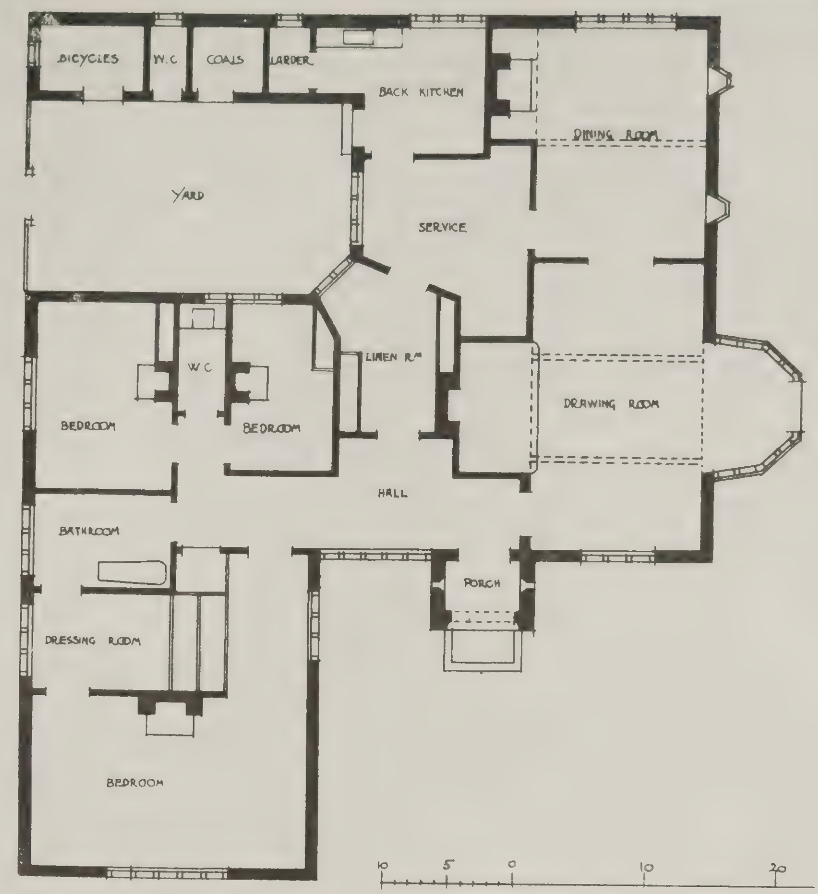
The house is designed to suit the particular wishes of the owner. The drawing-room and dining-room have open timber roofs, the partition between the two rooms being glazed with lead lights and clear glass in the upper part, so that the roof can be seen running throughout the entire length. The walls of these rooms are in half-timbering. The bedrooms are fitted with basins and wardrobes as fixtures. Externally the materials are Kent tiles for walls and roof, half-timbering, and rough-cast, the porch being of a warm-coloured stone. Mr. Alfred Cox, F.R.I.B.A., of 4, Adam Street, Adelphi, was the architect, and Messrs. Thomas Crossley and Son, of Bromley, Kent, were the builders.

House at Sidmouth.

This house was designed for a site with a fall of 1 in 5: hence the elongated plan, which saves excavation and brickwork. The house is built on the Sidmouth Manor estate. The walls are hollow, rough-cast outside, and the roof is covered with hand-made tiles. Mr. R. W. Sampson, of Sidmouth, was the architect, and Messrs. R. W. & J. Skinner, of Sidmouth, were the contractors.

House at Hampton Hill.

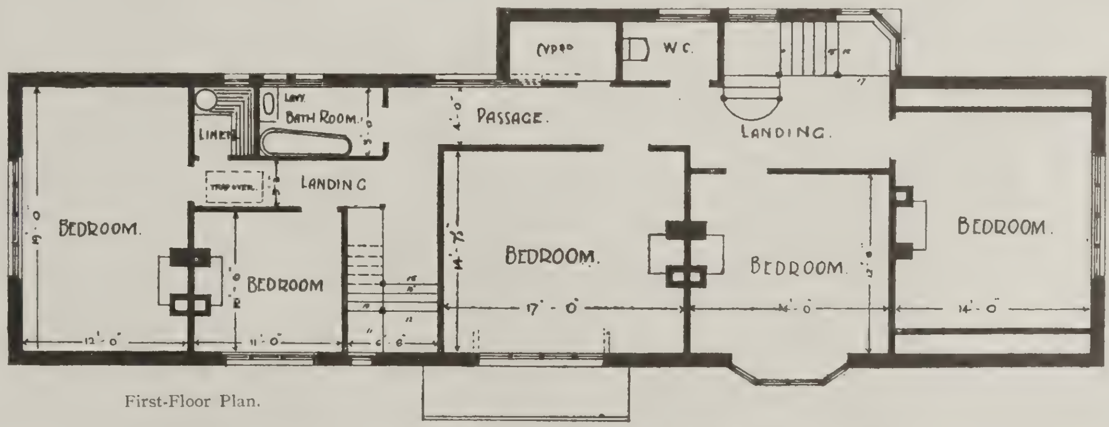
This house is one of a number now in course of erection in Park Road, Hampton Hill, Middlesex, for Mr. J. Curtis. It is rough-cast externally and roofed with red sand-faced tiles laid on a series of tiling fillets at the gable ends so as to throw the gables slightly out of the angle of 45 degs.; at the same time the main roof remains at 45 degs. The windows are divided into small squares with wooden bars. The front door and part of the internal joinery work is in oak. The ground-floor accommodation is shown on the illustration. The first floor comprises five bedrooms, bathroom, linen closet, &c.; the attic one bedroom, and boxrooms; coal and wine cellar and additional larder in the basement. Messrs. Castle and Warren, of Aulaby Road, Teddington, are the architects.



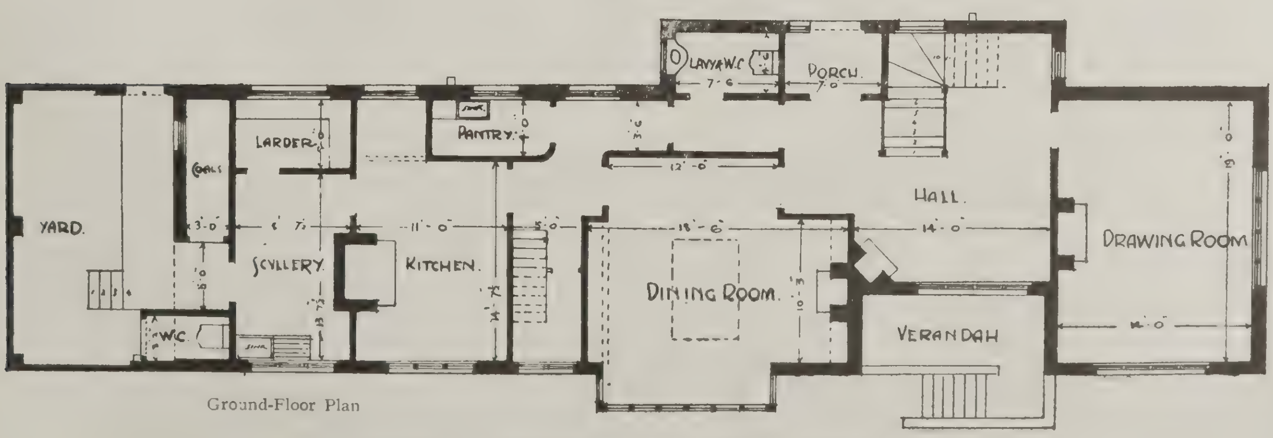
HOUSE AT SHORTLANDS, BROMLEY, KENT. ALFRED COX, F.R.I.B.A., ARCHITECT.

Riverside Bungalow near Reading.

The chief features of this bungalow are a living-room, with roomy ingle-nook, communicating direct with dining-room by means of folding doors, thus forming, when required, one large entertaining room. The square entrance-hall and living-room are panelled in oak, with ceiling beams exposed. The walls up to ground-floor sills are built of local red red bricks, and the walls are stuccoed, finished dead white. The outside timber work is formed of solid oak; the roofs of the bungalow are covered with sand-faced red tiles. Mr. W. P. Watson, of Loughborough, is the architect.



First-Floor Plan.



Ground-Floor Plan

HOUSE AT SIDMOUTH. R. W. SAMPSON, ARCHITECT.

Enquiries Answered.

Questions should in all cases be addressed to the Editor and be written on one side o the paper only.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional, or legal matters.

Pitch of Rivets in Girder.

MANCHESTER.—J. C. writes: "What is the theoretical pitch of riveting for a compound girder, say, 20ft. span, composed of two 20ins. by $7\frac{1}{2}$ins. rolled steel joists and six 14ins. by $\frac{1}{2}$in. plates? Is there a formula for such a case?"

The proper pitch for the rivets of a built-up girder cannot be determined from the dimensions of the plates. It depends upon the horizontal shear. This is explained in detail in "Designing Ironwork," Second Series, Part I., "Steel Box Girders" (Spon, 1s. 6d.).

Sale of Land for Building.

NOTTS.—T. writes: "Some time ago a client of mine purchased a plot of ground in a private avenue for the purpose of erecting a house thereon. The conveyance imposes the usual building conditions, as to the class of building to be erected, rental, &c., and all this has been faithfully observed, and the house completed. I now find that the vendor has offered for sale the remaining ground for building purposes. This is calculated to depreciate the value of my house considerably, although the purchaser was bound by the conditions from erecting such a building; and, further, my client was given the impression from verbal statement of the vendor that the avenue would be kept for erecting houses of similar class to my client's. There is no clause mentioned empowering the vendor to do this. What is the remedy, and what steps should be taken?"

This is a case in which I should recommend you to consult a solicitor at once, as the reply to your question entirely depends on the circumstances under which your client originally bought, and the wording of the contract for sale, as well as of the conveyance itself. If the property were publicly offered for sale by auction with restrictive covenants upon it, *and a portion then sold,* the vendor is bound by the restrictions in respect of the land unsold, and he cannot afterwards alter them by his mere *ipse dixit.* A verbal statement in such a case is probably worthless, though it is quite possible that it might render the utterer liable for damages caused. F. S. I.

Measuring Road with Hedge.

LIVERPOOL.—OFFSET writes: "Which is the correct way to measure land fronting a country road with a hedge and ditch at the side? Do you allow 4ft. from the butt of the hedge for the ditch in the usual way? Have not county councils powers to fill in the ditch at the side of a road, and to pave and use the land occupied by it? If so, the land should be measured to the butt of the hedge only, the area of the ditch not being included."

The boundary of the property is the outer edge of the ditch, not the stakeroot of the hedge, and naturally one would measure to the boundary. In most districts 4ft. is the accepted distance from the stakeroot, which should be adopted. County councils have no such power as that described. F. S. I.

A Church Scheme.

PLUMSTEAD.—H. W. writes: "A building committee to which I am secretary are about to have a set of plans prepared for a new church, schools, &c. What is their legal position in the following circumstances?—It will not be possible to build in a less time than three to five years. We propose to arrange with an architect for a definite sum, so that we may have an idea to set before our people and the invited subscribers. This having been done, could the architect, under the conditions, claim any further payment if after three or five years the committee proceeded with the job, employed a quantity clerk, issued contracts themselves, and engaged a clerk of works to superintend the job?"

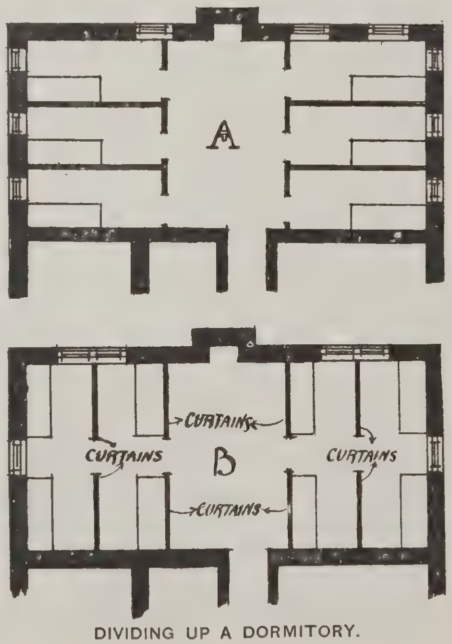
You should make a definite offer to your architect in the way you wish, and he can then refuse your terms if he does not care to entertain them. Once having obtained a straightforward bargain in writing, the committee may use the preliminary plans in their own way; but I confess the method suggested does not appear to me to be a very economical one, and will probably end in disaster. You had much better pay an architect for the preliminary drawings upon the understanding that if you should afterwards decide to entrust him with the work the cost of these preliminary sketches should be deducted from his commission.

F. S. I.

Dividing up a Dormitory.

HARROGATE.—OLD SUBSCRIBER writes: "It is proposed to divide the dormitory shown on the accompanying plan into cubicles for boys. What is the least size that could be used? How will the room best divide up to get maximum number of beds, and what is the usual construction of the cubicles—height, &c.? Is is usual to have doors? The existing floor is of wood."

The room is of unsuitable width to provide for a model dormitory. The windows, also, are badly spaced and of insufficient area. It will be well to remember that any work done should comply with the Board of Education's ruling. A cubicle, if enclosed, should provide for at least 65 to 70ft. of floor area and be of about 700ft. cube. It can be open above 7ft. 6ins. and the partitions framed and matchboarded. The door is best placed opposite the bed to allow it to be run into the gangway. The better scheme is shown in figure A. The Board of Education's present ruling permits 8 beds. These could be curtained off and placed as in scheme B. T.



DIVIDING UP A DORMITORY.

A Small Road Bridge.

JUNIOR writes: "Which is the best method of bridging a small stream? The roadway is 30ft. wide and the abutment walls are 8ft. apart. The bridge is to be of steel, and capable of sustaining traction engine traffic. A minimum depth of construction is important."

Dorman, Long & Co.'s trough girders will form the best bridge floor for a span of 8ft. and a width of 30ft. It is usual to allow a live load of 5cwts. per ft. super. in addition to the dead load of structure and road material, if traction engines are to be provided for. In short-span bridges it is also necessary to allow for a concentrated load in the centre equal to the load of one wheel of the traction engine upon a trough, say, 4 tons. Assuming a mean depth of road material of 15ins., the dead load would be about $1\frac{1}{2}$ cwts. per sq. ft. This would give a bending moment of

$$\frac{wl^2}{8} = \frac{\frac{5+1\frac{1}{2}}{20} \times 8^2 \times 12}{8} = 31{\cdot}2 \text{ ton-ins.};$$

or allowing for a concentrated load

$$\frac{wl^2}{8} + \frac{wl}{4} = \frac{\frac{1\frac{1}{2}}{20} \times 8^2 \times 12}{8} + \frac{4 \times 8 \times 12}{4}$$

$= 7{\cdot}2 + 96 = 103{\cdot}2$ ton-ins. This is much the more serious, as often happens with short spans. Dorman, Long & Co.'s section "B Maximum" has a moment of resistance of 113.75 ton-inches, and would be a suitable one to adopt.

HENRY ADAMS.

Rights of Adjoining Owners.

G. writes: "A and B are neighbours. A owns a one-storey span-roofed building with chimney flue and skylight, which has been in its present position and has enjoyed its present privileges for 20 years. B has just erected a three-storey building around A's building, and he states that the smoke from A's chimney discolours and damages his brickwork, and he claims that A should carry his stack and head above his (B's) building. A states that B's building has caused a serious downdraught to his flue, and claims that B should carry up the flue at his own expense to remedy the defect. Please state (1) the rights of each, saying whether there is any definite law or any previous case on the point; (2) whether A has acquired ancient lights for his skylight, and if so, at what angle his light area should be measured."

(1) By the Prescription Act (2 and 3 William IV., c. 71) twenty years' enjoyment of light to the skylight, and of air to the chimney, has given A the right to continue to so enjoy them. B has violated these rights and should be prepared to indemnify A accordingly. The law is very clear upon the subject (refer to the subject of "Easements" in any legal treatise) and only becomes doubtful when the actual measure of damages is to be ascertained. There are hundreds of decided cases upon the subject. (2) There is no fixed angle for light area, though 45 degs. has been mentioned in this connection. The legal question is, has A's light been substantially diminished? F. S. I.

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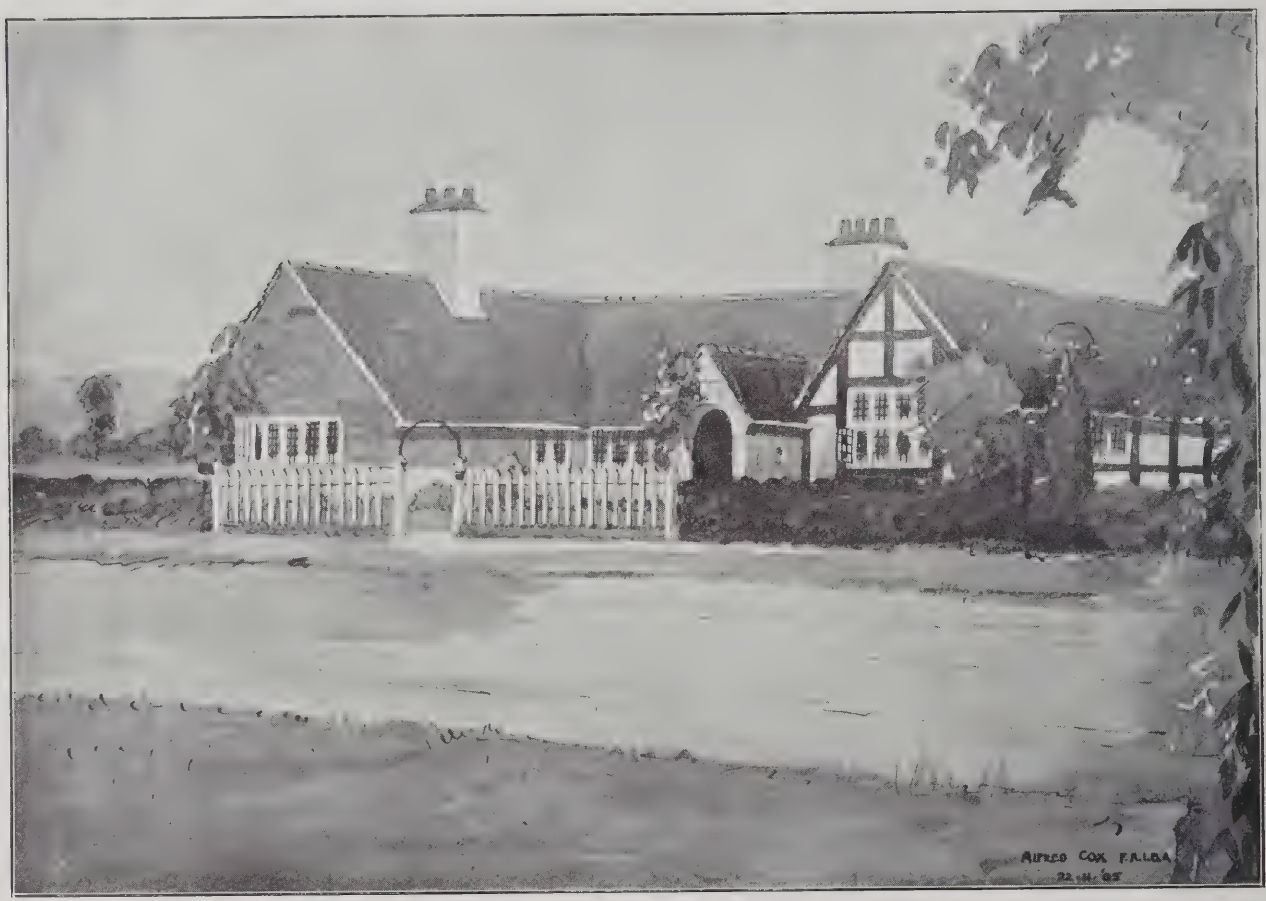
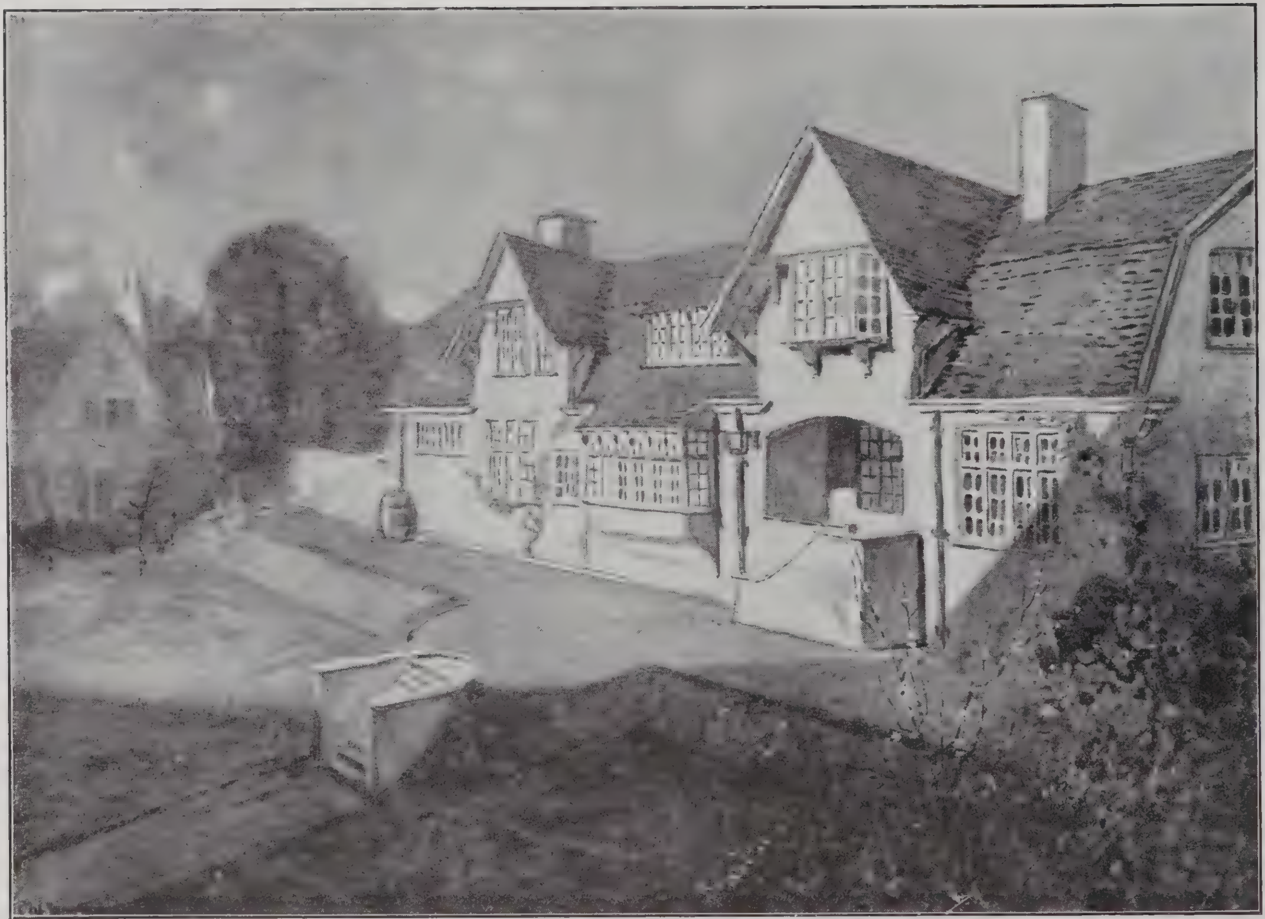
Supplement to
The Builders' Journal and Architectural Engineer,
Wednesday, December 5th, 1906.



HOUSE AT SHORTLANDS, BROMLEY, KENT. ALFRED COX, F.R.I.B.A., ARCHITECT.



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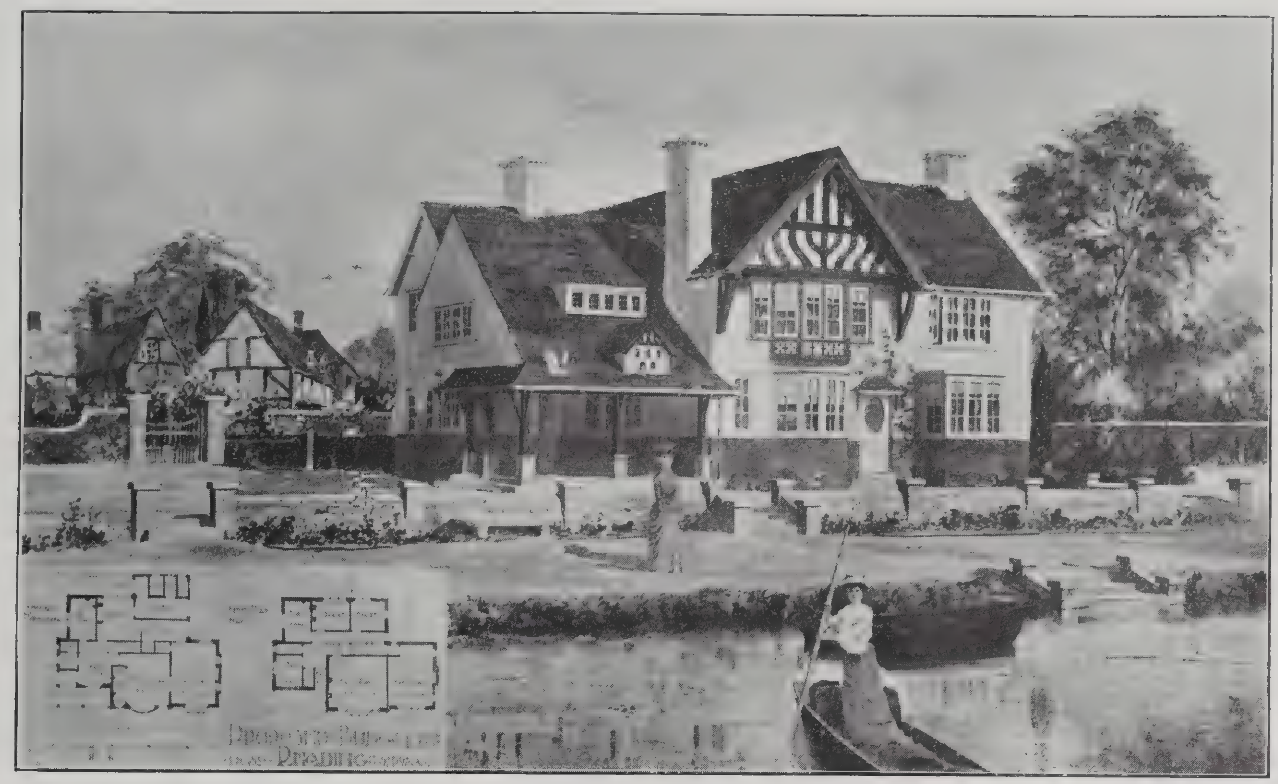
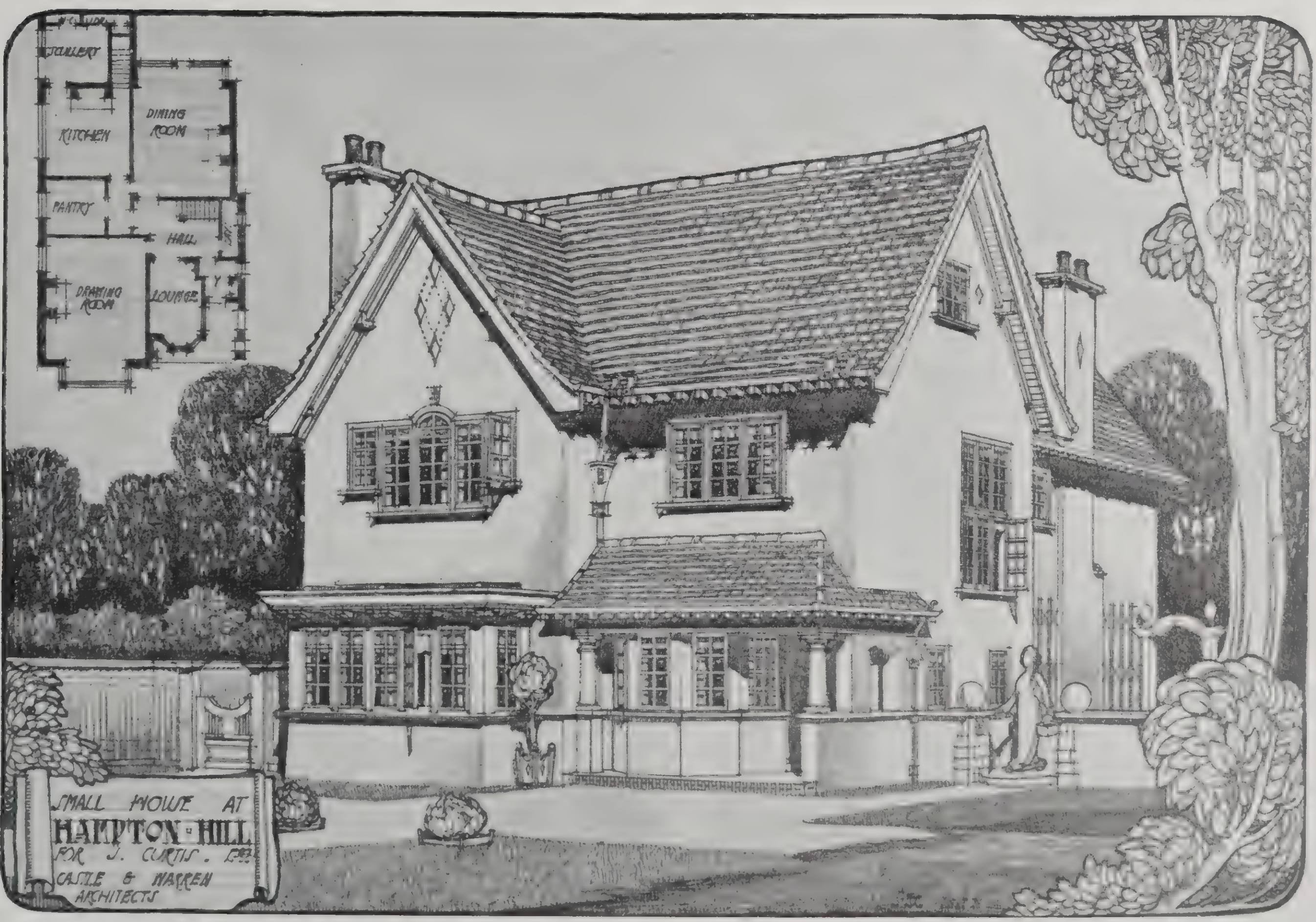


RIVERSIDE BUNGALOW NEAR READING. W. P. WATSON, ARCHITECT.



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THE ARCHITECTURAL ASSOCIATION.

The London Architect's difficulties.

A meeting of the Architectural Association was held on Friday evening at 18, Tufton Street, Westminster, the chair being occupied by Mr. Walter Cave, vice-president.

Mr. Cave announced that Mrs. Garner had made a present to the Association of 200 volumes from the library of her late husband, Mr. Thomas Garner. This announcement was received with much applause, and Mr. E. P. Warren spoke at some length on the abilities of the late Mr. Garner and the work he had done, both individually and in conjunction with Mr. G. F. Bodley.

A presentation

was then made to Mr. W. G. B. Lewis, who has done so much for the A.A. Day School. The presentation took the form of Mr. Gotch's fine book on "The Architecture of the Renaissance in England," together with a cheque for £50. Appreciation of the services rendered by Mr. Lewis was expressed by Mr. Walter Millard and Mr. G. H. Fellowes Prynne.

Mr. William Woodward, F.R.I.B.A., then read a paper on "The Difficulties which Beset an Architect in London, with Special Regard to Existing Legislation and other Controlling Authorities."

Mr. Woodward observed at the outset that if every architect or building owner were permitted to exercise his own free will, London would assume a picturesqueness, to say the least, which would be instructive, if not satisfactory. But the present question was not so much the non-necessity of control as the manner in which it was administered. Looking back, say, 40 years, it was startling to notice the difference in the way in which building works were permitted to be carried on.

A grandmotherly legislation

had sprung up, and was increasing every day, with the apparent object of stifling all individuality, and bringing everybody within a code of Acts of Parliament, rules, regulations and by-laws, most of them the result of officialism and red tape, and many of them the result of inadequate knowledge.

The architect who had to erect a building in London was pulled up at every stage by the London County Council, borough councils, medical officers of health, sanitary inspectors, district surveyors, surveyors to freeholders, litigants in "light" cases, party-wall awards, and sometimes, to add to his miseries, an interfering and objectionable client.

Moreover, many of the controlling bodies took upon themselves responsibilities which were quite unnecessary. The County Council, for example, forgot to say, in the case of covered ways and projecting iron and glass shelters, &c., that its duty was merely in regard to projection beyond the line of frontage. Having found that there was no objection to such covered ways, it might well leave the safe construction of the work to the architect and building owner; but, instead of that, it employed a staff of gentlemen to examine into every minute detail of construction, and thereby, of course, in the case of any failure, held itself responsible for the results.

Again, the borough councils were often far too particular about the works which came under their control. The architect had to meet the fads and fancies of medical officers of health and sanitary inspectors, and recently an enormous amount of unnecessary work had been placed upon the architect's shoulders in preparing plans and sections of water-closets, &c., which a practical-minded surveyor could settle in five minutes, without any such drawings.

At this juncture Mr. Woodward took occasion to say

something about district surveyors.

The architect had been made painfully aware of the different way in which the provisions of the Building Act were administered by different district surveyors: in some cases the whole intention of the Building Act being maintained, and the public interest looked after, without causing any friction with the architect, while, in other cases, a policy of pin-pricks and unnecessary interferences was carried on by straining to its utmost extent every section in the Building Act: and where one section did not apparently give sufficient elasticity for bothering the architect and the builder the district surveyor would sift out some other clause better enabling him to pursue his worrying tactics.

Surveyors to freeholders also took upon themselves responsibilities for construction, &c., which they were not bound in any way to assume, and by this means drove the architect to desperation by interferences in minor and trifling matters of detail which in no way concerned the reversion at the end of 80 years.

"Now," said Mr. Woodward, "let us assume that, after many months of patient endeavours on the part of the architect, the production of dozens of unnecessary drawings, and the consumption of an enormous amount of unnecessary time with all the varied bodies, in simply obtaining official sanction to what is proposed. The building starts, and almost before the demolition of the old premises is completed, down comes

a little army of adjoining owners,

with purely imaginary grievances as regards interference with 'light'; and, after obtaining injunctions, which stop all building works, the case is fought out in the Law Courts with two or three eminent surveyors on one side who swear that, if the building goes up as designed, the owner of the dominant tenement may as well go and drown himself at once, as he can only die a lingering death in consequence of being closed in in tomb-like fashion, deprived of every particle of 'light' and every particle of air that is so necessary to sustain life in London; and on the other side, three equally eminent surveyors will swear that the erection of the new building will not only not interfere with the 'light' hitherto enjoyed by the dominant owner, but his 'light' will be very materially improved by the erection of a building double the height of the old building pulled down.

"We all know the building hasn't gone so far without being the subject of sometimes

several party-wall awards

and in the communications between architect and architect as regards these party-wall awards, considerable experience is gained as to the real knowledge of architects, and their propensities to adopt the methods of the lawyer in arriving at a conclusion on very simple practical matters; and the architect to the building owner also discovers how varied the ideas of the architect to the adjoining owner are in the matter of fees. I have myself had instances where, with precisely the same award, which I have myself drafted, and with precisely the same work on the part of the adjoining owner's surveyors, in connection with the same building, the fees have ranged from 2 guineas to 25 guineas; and may I make an observation upon the

additional unnecessary trouble and expense

incurred in stamping the awards and counterparts. Personally, I never require this stamping to be done. It is true it only costs £2, but what I complain of is the unnecessary trouble and time which it involves."

Some practical suggestions

were made by Mr. Woodward. First, he suggested that the Building Act Committee should be abolished, or reduced to, say, 4 members, selected specially for their knowledge of building operations, and for their non-political tendencies. Then, in regard to the clauses in the new Building Act respecting risks from fire, there could be no doubt the L.C.C. was unnecessarily worrying, simply because an unfortunate fire occurred in Queen Victoria Street, which entailed a loss of life, for which the London Fire Brigade were not wholly irresponsible. The L.C.C. requirements about lobbies, ventilating trunks, and other absolutely unnecessary and untried ideas were the source of a large expenditure of money and serious interference with the building, and Mr. Woodward felt quite sure that, if the architects were left to themselves to provide reasonable means of escape in case of fire, far better results would be obtained.

The setting back of the building line at the rear of certain buildings, and the angle of 63½ degs., was

a monstrous interference

with the disposition of property. The control exercised by the L.C.C. over simple projections at the rear, or porticos and covered ways in the front of buildings should be shifted from that central body to the surveyors and councils of the respective local boroughs, who were far better able to judge the effect of such additions than the central body, who could know very little indeed of the local requirements of such a vast area as London.

The L.C.C. requirements as to theatres

were quite excessive. Everyone agreed that proper means of rapid exit should be provided. The Council, however, did not stop there, but must needs grope about after gas taps and the opening of doors in certain directions, which would probably be more mischievous in case of fire than if the old doors were left alone. Certain staircases, in the eyes of the Council, were safe if they had a certain tread and rise, and a certain number of steps in a flight, and absolutely unsafe if half an inch or so were taken from the tread or added to the rise. But why an additional step or two should make the building unsafe only the L.C.C. could say.

Building Agreements.

Then, again, the L.C.C. building agreements for letting land were too much on one side. The conditions in the building agreements of the great ground-landlords of London were sufficiently stringent; but the L.C.C. requirements were such that every building owner, with due regard to his financial prospects, would hesitate before binding himself to them.

So far as the district surveyors were concerned, Mr. Woodward said he would frame another Building Act, limiting their jurisdiction very much indeed, and only securing that the building should have its walls and floors of a substantial character; while, as to rights of "light," he would prevent any question on that subject being brought before learned judges in the High Court who had never seen the buildings in question, and who were quite unable to understand the effect of a new building upon the "light" of the dominant owner—such matters should be left to the decision of a tribunal of experts, similar to that under the Building Act of 1894.

In regard to surveyors to ground-landlords, Mr. Woodward said it would be well if some case of unnecessary interference and unwarranted straining of the building agreement clauses were fought out in a court of law. We should all then know better "where we are."

London 40 Years Ago.

"I am not aware," Mr. Woodward continued, "in looking back 40 years, that London was a very much worse place then, under the Metropolitan Board of Works and under the old vestries, than it is now, under the swelled body at Spring Gardens, and under the equally swelled bodies called borough councils. Regard for open spaces was secured by the then Lord Brabazon (now the Earl of Meath), the Chairman of the Metropolitan Gardens Association; and although the L.C.C. takes credit for maintenance as open spaces what would otherwise have been built upon, much of that for which they take credit is due to the Association I have referred to; in fact, I was myself, as honorary architect to that Association, the principal mover in preventing the L.C.C. building upon the triangular plot at the junction of Oxford Street and Bloomsbury Street; and equally in preventing the erection of a block of buildings, projected by the L.C.C., right in the centre of Piccadilly Circus."

In all these matters Mr. Woodward saw a growing consumption of red tape and officialism—ink and paper instead of the sound practical knowledge which existed 30 or 40 years ago. "Large building speculators are shutting up their pockets and thereby adding to the long list of unemployed in the building trade, simply because they will not submit to the delays, petty interferences, and results of inadequate knowledge forced upon them by various bodies. Surely some credit should be given to architects of repute and experience for knowing nearly as much about healthy and sound construction of a building as

an assembly of greengrocers and cheesemongers

or perhaps youthful scholars who come from technical schools, armed only with superficial knowledge, without any experience in active building operations, but who are led away by the crude ideas of faddy councillors who do no good whatever to buildings in course of erection, but, on the contrary, manage to make them inconvenient inside, and mutilate them outside."

Absurdities in the Country.

Going from London to the provinces, Mr. Woodward said they all knew what wretched results had arisen from the interferences of the Local Government Board in building operations, especially in cottages. "We all remember the picturesque cottages throughout the Kingdom, which have lasted for two or three centuries, which are generally composed of wood, with thin party divisions and picturesque tile roofs and half-timber exteriors, and that they have not led to any considerable loss of life from fire; I believe that the only few losses of life through fire in these cottages throughout the Kingdom has been the result of inebriety on the part of the occupiers; the Local Government Board, however, must needs try to apply to these country cottages the impossible provisions of the London Building Act, with brick external walls, the absurd carrying-up of party walls above the roof, and other perfectly ridiculous requirements which have done so much to stop the building of country cottages."

Discussion.

Mr. Douglass Mathews, in passing a vote of thanks to Mr. Woodward, referred to the fact that the district surveyors of London were an independent authority, and had been in existence for 250 years, and he thought it would be very regrettable if they became officials of the London County Council. With reference to Mr. Woodward's remarks about right-of-light cases, he referred to the Bill which had been drawn up by representatives of the Royal Institute of British Architects and the Surveyors' Institution, and placed before Parliament, which he thought would overcome many of the troubles at present existing.

Mr. George Hubbard seconded the vote of thanks. After giving some instances of absurd decisions by various authorities, he referred to the fact that in America no rights of light existed, but each building owner had to give attention to obtaining light from his own land. He thought the English system was distinctly unfair to adjoining owners.

After some remarks by Mr. Henry Lovegrove, Mr. C. H. Brodie proposed the following resolution:—"That this meeting of the Architectural Association, having listened to a paper on 'The Difficulties which beset an Architect in London,' and a discussion thereon, declares its conviction that the ratepayers of the Metropolis are put to a large amount of unnecessary trouble and expense by the excessive, and often absurd, requirements of the various authorities having control over building and sanitary works." This was seconded by Mr. Woodward, and carried *nem. con.*

Mr. Bernard Dicksee expressed his belief in the advisability of an appeal from all decisions of administrative bodies as a wholesome corrective.

With some final remarks from Mr. Saxon Snell and the chairman, and a reply by Mr. Woodward, the meeting terminated.

The new Cotton Exchange at Liverpool was opened by the Prince and Princess of Wales on Friday last. The building is in Old Hall Street, and, inclusive of site, has cost about £300,000. Messrs. Matear and Simon were the architects, their work being carried out with great expedition by The Waring White Building Co., Ltd., of London.

Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, *Great New Street, Fetter Lane, E.C.*

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Barnsley.—For new sewage works, for the Corporation. Mr. J. H. Taylor, M.I.C.E., borough engineer:—

	(A)			(B)		
W. Scott & Sons, Dewsbury	£26,629	5	0	£33,487	12	0
R Holmes & Sons, Chesterfield	23,822	1	0	27,068	8	0
Jones Bros., Stairfoot	23,458	18	10	26,126	4	2
R. H. B. Neal, Ltd., Plymouth	23,245	6	4	25,498	7	4
R. C. Crawford, Uddingston	22,130	0	0	22,747	17	6
W. R. Unwin, Ecclesfield	20,948	10	6	24,850	9	6
Johnson & Langley, Leicester	20,855	17	3	23,528	5	6
J. & J. Binns, Croydon	20,333	2	5	23,063	6	6
E. Taylor, Blackpool	20,108	18	10	24,023	7	10
W. Craig, Manchester	19,873	5	11	23,213	3	9
G. Lawson, Glasgow	19,355	0	0	22,013	4	10
J. K. Taylor & Sons, Barnsley	18,689	16	10	21,168	7	1
Parker & Sharpe, York	18,390	11	0	20,479	9	0
J. Byrom, Ltd., Bury	18,071	0	0	20,684	0	0
Ward & Tetley, Bradford	17,511	19	3	19,639	18	5
Lock, Andrews & Price, Nottingham	17,358	18	8	20,270	9	8
G. Mackay & Son, Edinburgh	17,199	16	7	20,142	4	10
J. Mackay, Carlisle	17,079	0	5	19,370	15	8
G. H. Mellor, Barnsley	17,052	8	9	19,507	5	2
A. J. Cottle, Rotherham	16,888	12	10	19,595	17	9
H. E. Buckley, Bradford	16,435	17	10	19,010	18	6
J. Moffatt, Manchester	16,221	14	11	18,292	14	6
J. Bentley, Bradford	15,951	5	6	18,053	16	8
A. Braithwaite & Co., Leeds	15,360	4	5	17,228	8	6
W. Waring & Sons, Huddersfield	15,241	7	11	17,168	18	5
W. Cunliffe, Birmingham	15,050	3	9	17,260	7	3

(A) Septic tanks, &c., and circular filters.
(B) Alternative scheme for septic tanks and rectangular filters.

Cardiff.—For alterations and additions to 4, St. John's Square, Cardiff, to convert the same into club premises. Mr. W. H. Dashwood Caple, architect, 2, Church Street, Cardiff:—

F. Bond	£1,945
S. Shepton & Sons	1,795
G. Beames	1,545
E. Turner & Sons	1,522
G. Hallett	1,500
E. Beavan, Penarth	1,496
Denby & Co., Bristol	1,495
D. Davies	1,449
Gough Bros.	1,446
F. C. Williams	1,400
F. Small*	1,330

*Accepted.
Rest of Cardiff.

Devonport.—For alterations at the rear of the "Camel's Head Hotel," Camel's Head, Devonport, for A. E. Davies, Esq. Mr. Edgar M. Leest, M.S.A., architect, 14, St. Aubyn Street, Devonport. Quantities by Messrs. Leest & Adams:—

S. Perkins	£342	14	2
Johnson Brothers	334	12	5
T. Sobey	290	0	0
F. Watts	280	12	6
Pearce Brothers*	277	0	0

*Accepted.

Devonport.—For the erection of two houses to be known as 21 and 22, Hamoaze Avenue, Camel's Head, Devonport, for Charles Swale, Esq. Mr. Edgar M. Leest, M.S.A., architect, 14, St. Aubyn Street, Devonport. Quantities by Messrs. Leest & Adams:—

T. Sobey, St. Budeaux	£570
S. Perkins, Devonport	436
J. F. Donne, St. Budeaux	430
F. Watts, Devonport	425
Pearce Brothers,* Devonport	409

*Accepted

Devonport.—For the erection of five terrace houses on the Western Mill Estate, for Sir John Jackson, Ltd. Mr. Edgar M. Leest, M.S.A., architect, 14, St. Aubyn Street, Devonport. Quantities by Messrs. Leest & Adams:—

T. Jenkin & Son	£1,730	0	0
F. Watts	1,730	0	0
G. H. Smith & Son	1,619	18	0
Pearce Brothers*	1,495	0	0
T. May & Son	1,432	0	0

*Accepted.

Ebbw Vale (Mon.).—For the erection of Council schools at Willowtown for the Education Committee. Mr. Harry Waters, architect, Waengoch, Beaufort. Quantities by architect:—

Davies & Son, Ebbw Vale	£21,017	0	0
Hughes & Stirling, Liverpool	17,200	0	0
Smith, Kidderminster	17,150	0	0
Stephens, Bastow & Co., Bristol	16,980	0	0
Powell, Hereford	16,860	0	0
Vaughan, Tredegar	16,700	0	0
Bowers & Co., Hereford	16,490	0	0
Newcombe, Tredegar	16,150	0	0
Rowlands & Davies, Ebbw Vale	16,099	0	0

Charles, Newport	15,750	0	0
Colborne, Swindon	15,635	11	0
Davies & Son, Cardiff	15,600	0	0
Jenkins, Newport	15,560	0	0
Davies, Cardiff	15,244	0	0
Evans & Co., Ebbw Vale	15,217	0	0
Morgan, Blaenavon	15,138	0	0
Williams & Son,* New Tredegar	13,894	0	0

*Accepted, subject to approval of Local Government Board.

Architect's estimate, £14,366 18s.

Fownhope (near Hereford).—Accepted for the erection of new stable, out-buildings, &c., for Mr. C. H. Rowberry. Mr. Herbert Skyrme, architect, 138, Widemarsh Street, Hereford :—

William Powell, Hereford	£200

Great Glen (Leics.).—For the conversion of a factory into two cottages with out-offices. Mr. J. Frank J. Goodacre, architect, Berridge Street Chambers, Berridge Street, Leicester :—

W. H. Allen, Leicester	£306
T. Herbert, Leicester	259
E. Haycock & Sons, Great Glenn	243
J. Batchelor & Sons,* Great Glenn	210

*Accepted.

Greenwich.—For the erection of new sorting office, for H.M. Office of Works, &c. :—

		Cr.
Dolman & Mathews	£4,292	£30
J. J. Quarterman	3,817	10
Leslie & Co.	3,470	18
E. Streather	3,339	100
T. G. Sharpington	3,248	10
J. Smith & Sons	3,230	50
J. McKay	3,228	80
Martin, Wells & Co.	3,200	—
Thomas & Edge	3,185	30
H. L. Holloway	3,162	15
E. Wallis	3,156	20
Fitch & Cox	3,155	20
J. Hollingsworth	3,153	80
McLaughlin & Harvey	3,146	135
F. Webster & Son	3,141	50
F. & T. Thorne	3,127	30
W. Mills	3,126	175
J. Barker & Co.	3,057	25
Johnson & Co.	3,045	10
H. J. Williams	3,025	15
H. Groves	3,000	50
J. Garrett & Son	2,999	18
B. E. Nightingale	2,986	27
Galbraith Bros.	2,985	45
W. H. Hyde	2,906	20
Edwards & Medway	2,760	20
J. Lonsdale	2,659	80

Hereford.—For alterations and additions to the old mansion house, Widemarsh Street, to form new business premises. Mr. Herbert Skyrme, architect, 138, Widemarsh Street, Hereford :—

William Powell	£709	0	0
Charles Cooke	698	0	0
W. P. Lewis & Co.	681	0	0
Wm. Bowers & Co.	662	15	0
E. W. Wilks*	605	0	0

*Accepted. (All of Hereford.)

Ilford.—Accepted for roofing in with reinforced concrete the septic tanks, &c., at their outfall works, Loxford Lane, for the Ilford U.D.C. Mr. H. Shaw, A.M.I.C.E., engineer and surveyor :—

D. T. Jackson, Ripple Road, Barking, Essex	£5,971	19	2

Lincoln.—For the erection of certain additions to the municipal technical school, for the City of Lincoln Education Authority. Messrs. W. Watkins & Son, architects, Silver Street, Lincoln :—

C. Baines, Newark	£6,375	0	0
Barlow & Co., Nottingham	6,290	0	0
J. Hutchinson & Son, Nottingham	6,250	0	0
W. Wright & Son, Lincoln	6,097	0	0
H. S. & W. Close, Lincoln	5,835	0	0
Brown & Son, Wellingborough	5,407	10	0
C. Wright,* Leicester	5,220	0	0

*Accepted.

London.—For the installation of additional plant at the Elephant and Castle sub-station, for the L.C.C. :—

British Westinghouse Electric and Manufacturing Co., London	£2,493	0	0
General Electric Co., Birmingham	2,489	13	0
Ferranti, Ltd., Hollingwood*	1,954	18	0

*Recommended for acceptance.

London, S.W.—For the erection of new school, Mitcham Lane, Wandsworth, for the L.C.C. Education Committee :—

J. Appleby & Sons, Lambeth	£21,605	0	0
L. H. & R. Roberts, Islington	21,247	0	0
W. Smith & Son, Harleyford Road	21,134	0	0
F. & H. F. Higgs, Herne Hill	21,038	0	0
J. Smith & Sons, South Norwood	20,895	0	0
E. Lawrence & Sons, City Road	20,126	0	0
J. Longley & Co., Crawley	19,978	2	10
J. Greenwood, Ltd., London Bridge	19,820	0	0
Holliday & Greenwood, Brixton	19,691	0	0
J. & C. Bowyer, Upper Norwood	19,640	0	0
Kirk & Randall, Woolwich	19,492	0	0
J. Garrett & Son, Balham Hill	19,309	0	0
Martin, Wells & Co., Vauxhall	19,302	0	0
L. Whitehead & Co., Clapham Road	19,265	0	0
W. Lawrence & Son, Tottenham	18,984	0	0
W. Johnson & Co., Wandsworth Common	18,950	0	0
J. & M. Patrick, Wandsworth	18,899	0	0
G. E. Wallis & Sons,* Broadmead Works, Maidstone	18,867	0	0

*Recommended for acceptance.

London, N.W.—For the rebuilding of Hampstead Road Bridge, for the L.C.C. :—

J. A. Ewart, London	£9,773	2	10
Perry & Co., London	8,660	0	0
C. Wall, Ltd., London	8,611	12	6
J. Dickson, St. Albans	8,590	3	9
Pedrette & Co., London	8,549	8	6
E. Bentley & Son, Leicester	8,464	8	9
J. Cochrane & Sons, London	8,426	17	6
A. Handyside & Co., Derby	8,274	13	9
Heenan & Froude, Manchester	8,249	11	4
Greig & Matthews, London	8,013	8	0
J. Strachan, Cardiff	7,980	0	0
B. E. Nightingale, London	7,915	0	0
A. Fasey & Son, Leytonstone	7,845	6	6
W. Muirhead & Co., London	7,834	4	6
M. & A. Dinnie, Enfield	7,633	13	10
G. Hay & Co.,* London	7,506	9	8

*Recommended for acceptance.

Manchester.—Accepted for the erection of new synagogue at Higher Broughton. Mr. Delissa Joseph, architect, London, E.C. Messrs. Gunson & Son, surveyors, Manchester :—

Burgess & Galt, Ardwick	£5,335

Manor.—For the erection of two new acute blocks and the rebuilding of the nurses' block at the Manor Asylum, for the Asylums Committee of the London County Council :—

Cummins & Sons, Ltd., Dorking	£22,173	0	0
Geo. Potter, Horsham	16,476	3	8
Potter Bros., Horsham	16,462	6	2
Lovell & Sons, Marlow	16,268	0	0
Henry Lovatt, Ltd., Wolverhampton	16,164	0	0
Longley & Co., Crawley	15,989	0	0
Messom & Sons, Twickenham	15,932	0	0
C. Wall & Co., Ltd., London	15,899	0	0
Leslie & Co., London, W.	15,706	0	0
Cropley Bros., Epsom	15,695	0	0
Lawrence & Sons, London, E.C.	15,694	0	0
Hyde & Co., Norwood	15,579	0	0
Cook & Son, Crawley	15,568	0	0
Foster & Dicksee, Rugby	15,522	0	0
J. & M. Patrick, Wandsworth	15,511	0	0
John Allen & Sons, Ltd., London, N.	15,500	0	0
S. E. Moss, Southend	15,474	0	0
Drowley & Co., Woking	15,020	0	0
Goddard & Sons, Dorking	15,000	0	0
Johnson & Co., Wandsworth	14,977	0	0
Stephens & Cons, Exeter	14,944	5	0
Kirk & Randall, Woolwich	14,930	0	0
Thomas & Edge, Woolwich	14,902	0	0
F. & G. Foster, Norwood	14,861	0	0
A. J. Colborne, Swindon	14,798	7	8
Holliday & Greenwood, Brixton	14,749	0	0
Oak Building Co., Cambridge	14,633	0	0
E. J. Saunders, Croydon	14,624	0	0
Hawkins & Co., Westminster	14,304	0	0
A. Faulks, Loughborough	14,080	15	6
Harris & Sons, Marlow	13,700	0	0
A. M. Coles, Plymouth	13,552	10	7
William Moss & Sons, Loughborough	13,240	6	8
B. E. Nightingale,* London	13,237	0	0

*Accepted.

Mile End (near Colchester).—For the foundations of main asylum building, for the Visiting Committee of the Essex County Lunatic Asylum. Messrs. F. Whitmore, county architect, and W. H. Town, A.R.I.B.A., joint architects, 4, Duke Street, Chelmsford. Quantities by Messrs. R. L. Curtis & Sons, 11 & 12, Finsbury Square, London, E.C. :—

S. Redhouse, sen.	£29,301	11	6
R. Lock	28,494	15	4
J. & T. Binn	26,849	4	11
G. Double	26,585	1	8
J. H. Macdonald	26,146	0	0
Perry & Co.	25,989	0	0
C. G. Hill	25,600	0	0
W. Chambers	25,599	0	0
Potter & Co.	25,500	0	0
Davies, Ball & Co.	25,062	0	0
Pedrette & Co.	25,000	0	0
Kirk & Randall	24,700	0	0
Bowen & Sons	24,567	0	0
S. A. Kenny	24,551	0	0
Allen & Sons	24,500	0	0
Everett & Son	24,350	0	0
Higgs & Hill	24,124	0	0
H. Watson	24,000	0	0
Bell & Son	23,595	0	0
McCormick & Sons	23,456	0	0
Willcock & Co.	23,378	0	0
Jackson & Co.	23,168	0	0
F. Evans	23,000	0	0
W. Manders	22,949	0	0
Kerr & Co.	22,783	1	4
Youngs & Sons	22,750	0	0
Lovatt, Ltd.	22,697	0	0
Neal & Co.	22,684	18	10
A. N. Coles	22,567	0	0
Blackwell & Co.	22,340	0	0
C. Wall, Ltd.	22,320	0	0
Wallis & Sons	22,200	0	0
Harris & Son	22,200	0	0
Godson & Sons	21,987	0	0
Grimwood & Sons, Sudbury	21,850	0	0
Zadig & Co.	21,843	0	0
Foster & Dicksee	21,823	0	0
J. Moffatt	21,721	13	7
W. Cunliffe	21,675	0	0
Johnson & Co.	21,622	0	0
T. Rowbotham	21,620	0	0
Kerridge & Shaw	21,593	0	0
Fasey & Son	21,577	2	3
Parnell & Co.	21,499	0	0
Wilson & Sons	21,329	18	4
Leslie & Co.	21,326	0	0
Spencer, Santo & Co.	21,200	0	0
Parkington & Sons	21,000	0	0
Moran & Sons	20,995	0	0
Lowe & Sons	20,990	0	0
Hawkins & Co.	20,938	0	0
F. G. Minter	20,888	0	0
Grimwood & Sons, Ipswich	20,877	0	0
Armitage & Hodgson	20,836	0	0
F. & E. Davey	20,587	0	0
Wood & Sons	20,234	4	9
F. Bennett	20,200	0	0
Moss & Co.	20,154	0	0
Pethick & Co.	19,977	0	0
Hunt & Co.	19,943	0	0
W. Willett	19,750	0	0
Hammond & Sons	19,563	0	0
F. & A. Willmott	19,544	0	0
Oak Building Co.	19,394	0	0
Muirhead & Co.	19,299	0	0
King & Son	19,080	0	0
F. C. Thurman	18,999	0	0
Chessum & Sons*	18,9[illegible]	0	0

*Accepted.

Current Market Prices.

METALS.

		£	s.	d.	£	s.	d.
Standard Copper	per ton	102	0	0	103	0	0
Do. Strong sheets	do.	116	0	0	117	0	0
Lead, soft foreign	do.	19	7	6	19	10	0
Do. English	do.	19	15	0	19	17	6
Do. pipes	do.	22	7	6	22	10	0
Do. sheets	do.	22	0	0	22	5	0
Galvanised Corrugated sheets	do.	13	15	0	13	17	6
Spelter G. M.	do	28	0	0	28	10	0
Angles, Scotland	do.	6	12	6	6	15	0
Bars, do.	do.	7	15	0	7	17	6
Marked bars, Staffs.	do.	8	7	6	8	10	0
Common bars, do.	do.	7	0	0	7	2	6
Angles, M'boro.	do.	6	10	0	6	12	6
Joists. M'boro	do.	6	5	0	6	7	6
Angles, Midlands	do.	6	7	6	6	10	0
Joists do.	do.	6	17	6	7	0	0
Girder plates, Midlands	do.	7	10	0	7	12	6
Angles, Foreign, c.i.f. Thames	do.	6	15	0	6	17	6
Tees do. do. do.	do.	6	17	6	7	0	0
Joists, do. do. do.	do.	6	5	0	6	7	6
Channels do. do. do.	do.	6	10	6	6	12	6
Plates do. do. do.	do.	7	7	6	7	10	0
Tin, Foreign	do.	198	0	0	199	0	0
Do. English ingots	do.	197	10	0	198	0	0
Zinc, sheets, Silesian, f.o.b.	do.	32	0	0	32	5	0
Do. do. V.M. do.	do.	32	5	0	32	10	0

TIMBER.

		£	s.	d.	£	s.	d.
Deals, Archangel, Yellow, 1st, 3×9	do.	20	0	0		--	
Do. do. do. 2nd, 3×9	do.	15	0	0	15	5	0
Do. do. do. do. 3×8	do.	13	5	0		—	
Do. do. do. 3rd, 3×9	do.	10	5	0	10	10	0
Do. do. do. do. 3×8	do.	10	5	0		—	
Do. do. do. 4th, 3×11	do.	7	15	0	8	0	0
Do. do. White, unsorted, 3×7	do.	8	0	0	8	5	0
Do. Blankaholm, Yellow, 1st, 4×9	do.	10	0	0		—	
Do. Halifax, Spruce, 1st, 2nd, & 3rd, unsorted, 3×8	do.	8	0	0		—	
Do. do. do. do. 3×7	do.	7	10	0		—	
Do. do. do. do. 3×6	do.	7	10	0		—	
Do. Kemi, Yellow, 1st & 2nd, 4×11	do.	11	5	0	11	10	0
Do. do. do. do. 4×9	do.	10	10	0		—	
Do. do. do. do. 3×9	do.	10	0	0	10	5	0
Do. do. do. do. 3×7	do.	10	0	0		—	
Do. Kovda, Yellow, 3rd, 3×9	do.	10	5	0		—	
Do. do. do. dry, 3rd, 3×9	do.	11	0	0	11	5	0
Do. Kallskav, Yellow, 5th, 3×7	do.	8	10	0		—	
Do. Langrov, Yellow, 5th, 4×9	do.	9	5	0		—	
Do. do. do. do 3×11	do.	8	10	0		—	
Do. Ljusne, Yellow, dry, 3rd, 3×8	do.	11	15	0		—	
Do. Ned rkalix, Yellow, 1st, 4×9	do.	11	15	0		—	
Do. do. do. do. 3×11	do.	13	5	0		—	
Do. do. do. do. 3×9	do.	11	10	0		—	
Do. Petschora, Yellow, 2nd, 3×11	do.	15	0	0		—	
Do. St. Petersburg, White, 3rd, 3×7	do.	7	10	0		—	
Battens, Archangel, Yellow, 2nd, 2×8	per std.	13	10	0		—	
Do. do. do. unsorted, 2½×7	do.	9	5	0	9	10	0
Do. Abo, Yellow, 1st & 2nd, 2×7	do.	9	0	0		—	
Do. do. do. do. 2×6	do.	8	10	0		—	
Do. do. do., unsorted, 2×4½	do.	7	15	0		—	
Do. Ingramport, White, unsorted, 2×6	do.	6	10	0		—	
Do. do. do. do. 2×5	do.	5	15	0		—	
Do. do. do., unsorted, 2×5½	do.	8	0	0		—	
Do. Langrov, Yellow, unsorted, 2×6	do.	9	10	0		—	
Do. do. do. 1¼×8	do.	6	10	0		—	
Do. Räfsö, Yellow, 4th 2½×7	do.	8	10	0		—	
Do. St. Petersburg, White, 3rd, 2½×7	do.	7	15	0		—	
Do. do. do. do. 2½×6	do.	7	0	0		—	
Do. do. do. do. 2×7	do.	7	15	0		—	

Complete List of Contracts Open.

WITH a few exceptions, news of Contracts Open are not repeated after they have been published once in these columns, so that readers will find particulars in our previous issues of other contracts that still remain open.

Unless expressly stated to the contrary, all deposits required for bills of quantities, &c., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair-wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

Dec. 6. Derby.—*Erection of lavatory,* Locomotive Department, Derby, and extension of awning, &c., at Evesham Station, for the Directors of the Midland Railway. Plans and specifications may be seen, quantities and particulars obtained on application to the Company's Architect, Cavendish House, Derby; or at the Engineer's Office, Derby Station. Sealed tenders to be forwarded by post to the Secretary of the Way and Works Committee, Midland Railway, Derby, not later than 9 a.m. on Dec. 6.

Dec. 7. Sneinton.—*Alterations to the Boys' Swimming Baths* at the Victoria Baths, Sneinton. Plans may be seen, and copies of the specification, quantities, and form of tender obtained from F. B. Lewis, city architect, Guildhall, on payment of a deposit of £1 1s. Sealed tenders, properly endorsed, to be delivered to S. G. Johnson, town clerk, The Guildhall, Nottingham, not later than 10 a.m. on Dec. 7. Fair wages clause.

Dec. 8. Orrell.—*Erection of new offices* for the U.D.C. Builders desirous of tendering must send in their names to R. Pennington, architect, Malvern Chambers, Wigan, on or before Dec. 8. £2 2s. will be charged for bills of quantities.

Dec. 8. Maesteg.—*Rebuilding of Bethania Welsh Baptist Chapel,* Maesteg. Plans and specification can be seen with Rev. Iorwerth Jones, Bethania View, Maesteg, and at the office of W. Beddoe Rees, architect, 5, Dumfries Place, Cardiff, from whom bill of quantities may be obtained on deposit of £1 1s. Tenders to be sent to T. Rees, secretary, 16, Bank Street, Maesteg, on or before Dec. 8.

Dec. 8. Glasgow.—*(1) Excavating, &c., work;* (2) iron and timber gymnasium appliances; (3) iron fencing, and (4) caretaker's box and water closets in connection with the proposed playground for children in Barcaple Street, Springburn, for the Corporation. Specifications and forms of tender may be had on application at the Office of Public Works, 64, Cochrane Street. Sealed offers, marked outside "Offer for .... Children's Playground," must be lodged with A. W. Myles, town clerk, City Chambers, Glasgow, on or before Dec. 8.

Dec. 10. Kingussie.—*Erection of new class rooms* at the Public School, Kingussie. Plans and specifications to be seen with A. Cattanach, architect, The Laurels, Kingussie, and offers will be received by L. Mackintosh, clerk to the School Board, till Dec. 10.

Dec. 12. Edinburgh, Glasgow and Aberdeen.—*Repairs to buildings* in charge of the Commissioners of H.M. Works and Public Buildings. Separate tenders are invited for the execution of—(1) Excavator's, mason's, and bricklayer's work; (2) carpenter's and joiner's work; (3) ironfounder's, smith's, and ironmonger's work; (4) slater's work; (5) plasterer's work; (6) plumber's and gasfitter's work; (7) painter's, paperhanger's, and gilder's work; (8) glazier's work; (9) blindmaker's and bellhanger's work, to buildings in (1) Edinburgh, (2) Glasgow, (3) Aberdeen, for three years from Jan. 1. The printed schedule, with form of tender, may be obtained on application to W. T. Oldrieve, H.M. Office of Works, Edinburgh, between 11 a.m. and 3 p.m., upon payment of 10s. for each schedule. Tenders must be delivered on or before Dec. 12, addressed to the Secretary, H.M. Office of Works, Storey's Gate, London, S.W., and endorsed "Tender for Ordinary Works and Repairs," (1) Edinburgh, (2) Glasgow, (3) Aberdeen, as the case may be.

Dec. 12. London, N.—*Extension of, and an additional storey* to, the laundry at the Edmonton Workhouse, at Upper Edmonton. Drawings and specifications of the proposed work may be seen at the offices of the architect, S. Hill, 106, Cannon Street, E.C., and bills of quantities had on payment of £5 5s. (cheque). Sealed tenders to be delivered to F. Shelton, clerk, Lower Tottenham, on or before 9 a.m. on Dec. 12.

Dec. 14. London, S.E.—*Enlargement of the sorting office* at Lewisham, S.E. Drawings, specification, and a copy of the conditions and form of contract may be seen on application to J. Wager, H.M. Office of Works. Bills of quantities and forms of tender may be obtained of the Secretary, H.M. Office of Works on payment of £1 1s. Tenders must be delivered before 12 noon on Dec. 14, addressed to the Secretary, H.M. Office of Works, &c., Storey's Gate, London, S.W., and endorsed "Tender for Lewisham Sorting Office Enlargement."

Dec. 17. Hedon.—*Additions and alterations to* the Council School, Hedon. Plans and specifications may be seen, and forms of tender and copies and quantities obtained, on application to the Building Surveyor, County Hall, Beverley, upon depositing £1 1s. A copy of the plans and specification will be deposited at the Council School, Hedon, after the above date for the convenience of persons tendering. Tenders endorsed "Hedon Council School Extension" must reach J. Bickersteth, clerk to the East Riding Education Committee, County Hall, Beverley, on or before 10 a.m. on Dec. 17.

Dec. 17. New Shoreham.—*Alterations and additions* to the New Shoreham Council Schools Plans, specifications, and conditions of contract may be seen and forms of tender obtained at the offices of A. W. Nye, 2, Duke Street, Brighton. The contractor whose tender is accepted will be required to enter into a contract with the West Sussex and Chichester Local Education Authority, and, if required, to enter into a bond with two approved sureties for the due carrying out of the contract. Tenders, sealed and endorsed "Tender for Alterations and Additions to the New Shoreham Council Schools," to be addressed and delivered to L. Thompson, secretary, Education Offices, Horsham, not later than first post, Dec. 17.

Dec. 18. Durham.—*Additions to Croxdale Council School.* Plans, specifications, and conditions of contract may be seen of W. Rushworth, F.R.I.B.A., architect, County Education Offices, Shire Hall, Durham. Quantities may be obtained on application to the Architect, to whom sealed endorsed tenders must be delivered not later than Dec. 18.

Dec. 19. Bilston.—*Re-glazing, without putty, of portions* of the roof of their covered market hall, Church Street, Bilston, for the U.D.C. Persons tendering must state the system of glazing suggested, the period for which they will guarantee the work, and what security they offer in support of such guarantee. The roof may be inspected upon application to J. P. Wakeford, Assoc.M.Inst. C.E., engineer and surveyor, Town Hall, Bilston, and tenders, addressed to him, sealed and endorsed "Tender for Market Hall Roof," must be delivered before 12 noon on Dec. 19.

Dec. 25. Worcester.—*Erection of new warehouse* and offices for Kay's, Ltd. Builders desirous of tendering should apply to Simpson & Ayrton, architects, 3, Verulam Buildings, Gray's Inn, London, W.C., on or before Dec. 25. Quantities will be supplied, for which a deposit of £2 2s. will be charged.

Dec. 29. Carmarthen.—*Erection of new workhouse* at Carmarthen. Contractors desirous of tendering are requested to send in, not later than Dec. 8 next, their names and addresses to A. I. Jones, Board's architect, 2, Spilman Street, Carmarthen, together with a cheque for £2 2s. for bill of quantities. Sealed tenders (marked "New Workhouse") must be delivered to J. Saer, clerk to the Guardians, 7, Hall Street, Carmarthen, not later than Dec. 28. The tenders will be opened at the Board meeting on Dec. 29.

Jan. 17. London, S.E.—*Alterations and additions at the Infirmary,* Lower Road, Rotherhithe, S.E., according to plans and specification prepared by A. H. Newman, and quantities by W. T. Farthing & Son. Persons desirous of tendering for the works are required to send their names and addresses before Dec. 8 to E. P. Fenton, clerk to the Guardians, 283, Tooley Street, S.E., and to deposit with him a £50 Bank of England note. As soon after Dec. 8 as possible, forms of tender, bills of quantities, etc., and all other necessary information will be supplied to those persons whose names, addresses, and deposits have been supplied to the Clerk to the Guardians. The specification and plans of the works will then be open for inspection by such persons at the architect's offices, A. H. Newman, 31, Tooley Street, London Bridge, S.E., on production of the form of tender. Fair wages clause. Sealed tenders, endorsed "Tender for Alterations and Additions, Infirmary," must be delivered personally to E. P. Fenton, clerk, 283, Tooley Street, S.E., at 6 p.m. on Jan. 17, accompanied by the bills of quantities, &c., in a separate sealed envelope. The tenders will be opened and considered at 7 p.m. at the meeting of the Guardians on Jan. 17, at their Board Room, at which place, date, and time a responsible member of the firm tendering must be in attendance.

ENGINEERING.

Dec. 7. Portsmouth (Contract No. 12).—*Supply of steam, exhaust,* feed and circulating water-piping, for the Corporation. The specification and drawings, with general conditions and form of tender, can be obtained on application to A. Hellard, town clerk, Town Hall, Portsmouth, and a deposit of £2 2s. must accompany any such application. Any further particulars can be obtained on application to V. G. Lironi, M.I.M.E., A.M.I.E.E., tramways engineer, Engineer's Office, Vivash Road, Fratton, Portsmouth. Fair wages clause. Tenders must be delivered to the Town Clerk, Town Hall, Portsmouth, not later than 12 noon on Dec. 7.

Dec. 12. London, E.C.—*Supply and delivery of electric cranes,* &c., for the East Indian Railway Co., as per specification to be seen at the Company's offices. Tenders are to be sent to C. W. Young, secretary, Nicholas Lane, London, E.C., marked "Tender for Electric Cranes," not later than 12 noon on Dec. 12. For each specification a fee of £1 1s. is charged, which cannot under any circumstances be returned.

Dec. 12. London, N.E.—*Building in a Lancashire boiler,* &c., at the Workhouse, Sidney Road, Homerton, N.E. The boiler is already on the premises. Specification, conditions of contract form of tender, and order to view the site can be obtained of F. R. Coles, clerk to the Guardians, Clerk's Office, Hackney Union, Homerton, N.E., where also the plans (as prepared by L. J. Todd, consulting engineer, 25, Brooke Road, Stoke Newington, N.) may be inspected. The contractor will be required to give approved security for the due performance of the contract in a bond, the form of which may be seen at the Clerk's Office. Sealed tenders, endorsed "Building in Lancashire Boiler, &c.," must be delivered to F. R. Coles not later than 2 p.m. on Dec. 12.

Dec. 12. Cheddington.—*Supplying, carting, excavating* for, laying, and jointing of about 2,500 yds. of 4-in. and 3-in. cast-iron pipes and specials, including fixing valves, hydrants, &c., and constructing brick service reservoir, and all works in relation thereto, for the Cheddington water supply. Plans and specifications may be seen and copies of the quantities and forms of tender obtained from Sands & Walker, engineers, Milton Chambers, Nottingham, on payment of £2 2s. (by cheque). Sealed and endorsed tenders to be sent to Sands & Walker, Milton Chambers, Milton Street, Nottingham, on or before Dec. 12.

Dec. 12. Croydon.—*Supply of laundry machinery,* electric motors, wiring, &c., at the Croydon Mental Hospital, situated at Warlingham, Surrey. Plans and specifications may be seen on application at the office of the Borough Engineer, Town Hall, Croydon, and copies thereof and forms of tender may be obtained on receipt of a bona fide tender. Tenders on the prescribed form to be sent to F. C. Lloyd, clerk to the Visiting Committee, Town Hall, Croydon, by 11 on the forenoon of Dec. 12.

Dec. 13. Monaghan.—*Carrying out of the following works* at new building for the Joint Committee of the Monaghan Asylum:—(a) Internal plumbing work; (b) heating; (c) cooking apparatus; (d) gasfitting; (e) fire mains, in accordance with plans and specifications, which may be seen at the Boardroom of the Asylum between 10 a.m. and 5 p.m. on any week day. Tenders to be forwarded by registered post, endorsed "Tender for Plumbing Work, &c.," by Dec. 13. Tenders to state the names of two solvent securities, who will be prepared to enter into a bond conditioned for the due fulfilment and for the completion of the contract by such date as the Committee may determine.

Dec. 15. Handsworth.—*Supply, delivery and erection* of the following plant at their electric power station, for the U.D.C. Contract No. 15—Extension water-tube boilers (two); Contract No. 16—Extension engine (500 i.h.p.) and dynamos (one 315 kw. and two 45 kw.). Tenders will only be considered for the whole of the work covered by each specification, and not for any part thereof. Copies of the specifications, with the conditions of contract, &c., can be obtained from H. Ward, clerk, The Council House, Handsworth, near Birmingham, on payment of £3 3s. The specifications, conditions of contract and drawings, can be seen at (but not obtained from) the offices of the consulting engineers, Kennedy & Jenkin, 17, Victoria Street, Westminster, London, S.W. Tenders, on the prescribed form, in sealed envelopes, and endorsed on the outside "Electric Light and Power Supply Tender, Contract No. —," must be delivered to H. Ward, at the Council House, before noon on Dec. 15. Fair wages clause.

Dec. 17. Portsmouth.—*Construction and maintenance* of an overflow weir chamber on the existing main low-level sewer, an underground pumping station, and other works, for the Borough of Portsmouth. The specification, form of tender, and bill of quantities may be obtained from A. Hellard, town clerk, Town Hall, Portsmouth, on payment of a sum of £2 2s. The drawings may be seen, and further information obtained, upon application at the offices of Bramwell & Harris, 5, Great George Street, Westminster, S.W. Tenders under seal, and endorsed "Tenders for Works for the Prevention of Storm Water Flooding in the Low-lying area of Southsea, Contract No. 3," must be delivered to the Town Clerk at or before 12 on Dec. 17.

Dec. 17. Castleblayney.—*Construction of a storage reservoir,* filters and clear water tank, providing and laying cast-iron pipes, &c., for the U.D.C., according to plans and specifications prepared by F. Bergin, B.E., 36, Westmoreland Street, Dublin, which can be seen at the office of B. M'Ardle, clerk of Council, Courthouse, Castleblayney, during ordinary office hours. Tenders, accompanied by a schedule of prices, and containing the names and addresses of two solvent securities willing to join in a bond of £1,000, or a Guarantee Society bond for the same amount, for the due performance of the contract, will be received by the Clerk up to 12 noon on Dec. 17. Tenders should be addressed to the presiding Chairman and endorsed "Tender for Castleblayney Sewerage and Waterworks," and no tender will be considered which is not on the proper form, to be had from the Clerk for a payment of £1. As the Council have decided on joining the schemes in one contract, the aggregate amount in tender for sewerage and waterworks will be the deciding price.

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Jan. 1. Bray, Ireland.—*Supplying and erection of a high-tension* switchboard and instruments. Specification and form of tender may be obtained from W. J. U. Sowter, A.M.I.E.E., electrical engineer to the Council, on payment of a deposit of £2 2s. Tenders, sealed and endorsed "Switchgear," to be delivered to P. MacDonnell, clerk to the Council, Town Hall, Bray, Ireland, not later than 10 a.m. on Jan 1.

No date. Swansea.—*Construction and erection of two swing bridges,* one over the entrance lock to the King's Dock, and the other over the communication passage with the Prince of Wales' Dock, together with hydraulic machinery for working the same, for the Swansea Harbour Trust. Specifications and plans and forms of, and instructions for, tender can be obtained on application to T. Strick, clerk, Harbour Offices, Swansea, on payment of £5 5s.

IRON AND STEEL.

Dec. 7. Portsmouth.—*(1) To provide and fix a new iron fence* with gates around two pieces of land at the Circle, Clarendon Road, Southsea, in the Borough of Portsmouth. (2) To construct, complete and maintain in thorough repair a ladies' chalet at the Circle, Clarendon Road, for six calendar months from the completion of the whole. The specification and plan may be seen, and a form of tender obtained for each of the works at the Borough Engineer's Office at the Town Hall. The form of tender for each is to be completely filled in and sent under cover to reach A. Hellard, town clerk, Town Hall, Portsmouth, not later than 10 a.m. on Dec. 7.

Dec. 12. Durban, Natal.—*Supply and delivery* "free on board" of No. 18 iron window frames, size 10ft. by 5ft., for the Tramway Car-Shed. Specifications and drawing can be obtained from W. H. Radford, C.E. (consulting and representative engineer to the Corporation), Albion Chambers, Nottingham. Sealed and endorsed tenders must be delivered to Webster, Steel & Co., agents to the Durban Corporation, 5, East India Avenue, Leadenhall Street, London, E.C., on or before Dec. 12.

Dec. 19. Watford.—*Supply of a quantity of vertically cast-iron pipes* of various diameters for water mains at Nascote House Estate, together with all the necessary fittings, for the U.D.C., in accordance with printed specification and tender forms, which can be obtained at the Engineer's Office. Sealed tenders to be sent to the Offices of the Council, 14, High Street, Watford, addressed to H. M. Turner, and endorsed "Tender for Water-Mains," on or before Dec. 19.

PAINTING AND PLUMBING.

Dec. 6. Warrington.—*Painting of the new extensions* at the Police Buildings. Specifications and all further information may be obtained at the Office of the Borough Surveyor, Town Hall, at which place tenders must be delivered before 12 on Dec. 6.

Dec. 10. Newport, Mon.—*Painting and colouring* at the Blaina Central Council School and at the Garnvach Council School. Specifications may be seen of C. Dauncey, clerk to the Nantyglo and Blaina Group, County Council Offices, Newport, Mon., or at the Schools. Sealed tenders, endorsed respectively "Painting Tender, Blaina School," and "Painting Tender, Garnvach School," are to be in the hands of C. Dauncey not later than Dec. 10.

ROADS AND CARTAGE.

Dec. 5. London, N.—*Making-up of the following streets,* for the Wood Green U.D.C. :—(1) Braemar Avenue; (2) Eldon Road (Section 2); (3) Homecroft Road (East of Eldon Road); (4) Norman Avenue (East of Eldon Road), and (5) Grainger Road, all within the said Urban District. The plans, sections, and specifications may be seen, and bills of quantities obtained on application to C. J Gunyon, A.M.I.C.E., surveyor, at the Offices of the Council, Town Hall, Wood Green, upon payment of a deposit of £1 1s. Sealed tenders, upon the forms supplied only, to be delivered to W. P. Harding, clerk of the Council, Town Hall, Wood Green, N., not later than 5 p.m. on Dec. 5. Fair wages clause.

Dec. 6. London, S.W.—*Repairing and dressing the tar paving,* &c., at the Infirmary, situate St. John's Hill, S.W., for the Guardians of the Wandsworth Union. Form of tender and specification may be obtained upon application to F. W Piper, clerk, Union Offices, St. John's Hill, Wandsworth, S.W., and the same must be returned not later than 10 a.m. on Dec. 6.

Dec. 7. Kesteven, Lincs.—*Supply of broken granite, slag,* and slag dust for the main roads for the year 1907-1908, for the C.C. Forms of tender may be obtained from W. B. Purser, Assoc M.Inst.C.E., County Surveyor's Office, Grantham, to whom tenders, endorsed "Tenders for Materials," together with samples, must be delivered on or before Dec. 7.

Dec. 7. Richmond, Surrey.—*Levelling, metalling, paving and making good* North Road, Dancer Road, Darell Road and Chiltern Road (part of). Drawings and conditions of contract may be seen, and all particulars obtained, on application to J. H. Brierley, borough surveyor, Town Hall, Richmond, Surrey, where also a form of tender, together with schedule, and a copy of the specification obtained on payment of a deposit of £1 1s. No tender will be considered unless it is properly filled up and received within the time limited, and no expense in connection therewith will be paid to any person submitting a tender. Sealed tenders, properly endorsed, must be delivered to F. B. Senior, town clerk, at the Town Hall, Richmond, Surrey, on or before 4 on Dec. 7.

Dec. 10. London, S.E.—*Kerbing, channelling, foundations* for asphalt paving and road work in Elfindale Road, Herne Hill. Specification and form of tender can be obtained from W. Oxtoby, borough engineer, Town Hall, and tenders must be delivered on or before Dec. 10, not later than 6.30 p.m.

Dec. 10. Finchley.—*Supply of $\frac{1}{4}$-in. crushed shingle* for road gritting for the period ending March 31, 1907, for the U.D.C. The estimated amount required is from 200 to 600 tons. Sealed tenders, endorsed "Shingle," to be delivered to E. H. Lister, clerk to the Council, by 5 p.m. on Dec. 10.

Dec. 10. Hebburn.—*Excavating, bottoming, macadamising, channelling,* &c., in South Street, Hebburn, for the U.D.C. Plans, sections and specifications may be seen, and quantities obtained on application to H. Paterson, surveyor, at the Council Offices, Argyle Street, Hebburn. Tenders, endorsed "New Street," and addressed to the Chairman of the Building, Sanitary, and Nuisance Committee, to be delivered at the Council Offices, not later than noon on Dec. 10.

Dec. 12. London, W.—*Making-up and paving* Larden Road (part of). Plans and specification may be seen, and form of tender obtained, on application to H. Mair, borough surveyor. Sealed tenders, endorsed "Tender for Paving Work," must be delivered to H. Thompson, town clerk, Town Hall, Broadway, Hammersmith, not later than 6 p.m. on Dec. 12.

SANITARY.

Dec. 7. Richmond, Surrey.—*Construction* of about 66yds. 1in. of 12-in. surface-water sewer under the railway embankment at Kew, for the T.C. Drawings and conditions of contract may be seen, and all particulars obtained, on application to J. H. Brierley, borough surveyor, Town Hall, Richmond, Surrey, where a form of tender, together with a copy of the specification and bill of quantities, may be obtained on payment of a deposit of £1 1s. No tender will be considered unless it is properly filled up and received within the time limited, and no expense in connection therewith will be paid to any person submitting a tender. Sealed tenders, properly endorsed, must be delivered to F. B. Senior, town clerk, at the Town Hall, Richmond, Surrey, on or before 4 on Dec. 7.

Dec. 8. Swinton.—*Supply of sludge pump* at Swinton Sewage Works, for the Swinton and Pendlebury U.D.C. Particulars and form of tender can be obtained on application to H. Entwisle, Council Offices, Swinton, near Manchester. Sealed tenders to be returned, endorsed "Tender for Pump," to W. T. Postlethwaite, clerk to the Council, Council Offices, Swinton, not later than Dec. 8.

Dec. 14. Bushbury.—*Supply and laying of about 1,190yds.* of 12-in., 2,030yds. of 9-in., and 650yds. of 6-in. stoneware pipe sewers, together with the construction of all manholes, lampholes, and flushing chambers required, also for the construction of sewage-disposal works, including detritus and septic tanks and three circular filters and appurtenances, for the Bushbury (Oxley District) sewerage and sewage disposal. Plans may be seen, and specifications, bills of quantities, and form of tender may be obtained, on application to the Engineer to the Council, H. M. Whitehead, Engineer's Office, Penkridge, Stafford, upon payment of £5 Bank of England note. Sealed tenders, on the forms supplied, endorsed "Bushbury Sewerage," must be delivered to A. W. Carver, clerk to the Council, Union Offices, Cannock, not later than 10 on Dec. 14.

Dec. 19. Herne Bay.—*Construction of about $3\frac{3}{4}$ miles of brick and concrete* and pipe sewers, with all the necessary manholes, ventilators, and flushing arrangements, the construction of a pumping station, cottage, and buildings, and the provision of pumping machinery, for the U.D.C. Plans and specification of the works may be seen and the form of tender obtained at the office of B. Latham, M.Inst.C.E., Parliament Mansions, Victoria Street, Westminster, the engineer for the works, or at the office of F. W. J. Palmer, the surveyor to the Council, at his office at Herne Bay. The quantities of the several works have been taken out by C. E. Bruges, A.M.I.C.E., 1, Victoria Street, Westminster, and may be had on application either to the Engineer or Surveyor on deposit of £10. Sealed tenders, on the form supplied attached to the quantities, endorsed "Tender for Sewerage Works," are to be delivered to J. Jubb, clerk to the U.D.C., at Herne Bay, on or before noon on Dec. 19.

Dec. 19. Ware.—*Providing and laying* about 150yds. of 24-in. concrete tube storm-water drain and sundry other works in Star Street, Ware, for the U.D.C. The drawings and specification, with bill of quantities and form of contract, can be seen at the Office of the Council's Surveyor, H. F. Hill, New Road, Ware, between 10 a.m. and 4 p.m., and copies of the specification and forms of tender can be obtained on payment of £1 1s. Sealed tenders, endorsed "Star Street Drainage," are to be delivered to G. H. Gisby, clerk to the Council, Council Offices, Ware, not later than Dec. 19.

TIMBER.

Dec. 10. London, N.W.—*Supply of about 285,000 Jarrah blocks* in strict accordance with the conditions of the specification, for repaving Park Street, Camden Town, for the Highways, Sewers and Public Works Committee. Fair wages clause. No tender will be received unless made out on one of the official forms, which, with any further information, can be obtained on application to W. N. Blair, M.Inst.C.E., borough engineer and surveyor, up to noon on Dec. 10. Sealed tenders to be delivered, signed by the intending contractors, at the Offices of the Works Department (No. 4, First Floor) not later than 5 in the afternoon of Dec. 10.

MISCELLANEOUS.

Dec. 8. London, S.E.—*Supply of the following* for the House Committee of Guy's Hospital, for twelve months from Jan. 1, 1907 :—No. 1, Bricks, lime, and cement; No. 2, sand, ballast, and rubbish cartage; No. 3, sheet lead, pipes, &c.; No. 4, painter's materials. Further particulars, with forms of tender, may be obtained from the Superintendent. Tenders, duly sealed, should be sent in not later than 12 noon on Dec. 8.

Dec. 12. Dublin.—*Supply of the following articles,* from Jan. 1 to Dec. 31 :—Brass, gunmetal, &c., broken stone, cartage, foreign timber, iron castings, &c., ironmongery, &c., nails, &c., paints, oils, &c., paving setts and broken stones, planks and deals, steel and iron, white and red lead. Securities will be required. Preference will be given, after due regard to price and quality, to articles manufactured in Ireland. Sealed tenders, addressed to N. Proud, secretary, Port and Docks Office, Westmoreland Street, Dublin, and endorsed on the outside, "Tenders for ....," will be received up to Dec. 12. Forms of proposal may be had from the Secretary between 11 and 1.

Dec. 12. Macclesfield.—*Supply of drain pipes, castings,* cement, bricks, ironmongery, iron and steel, timber, hardwood, paints and oils, during the year ending Dec. 31, 1907, for the Corporation. Forms of tender can be obtained at the Borough Surveyor's Office. Fair wages clause. Tenders to be sent, addressed to the Chairman of the Highway Committee, Town Hall, not later than Dec. 12, marked outside "Tender for ...."

Dec. 13. Manchester.—*Supply and delivery* of the fireclay goods, for the Gas Committee, required during next season at their several gasworks. Full particulars and forms of tender may be obtained from C. Nickson, superintendent, at the Gas Offices, Town Hall, Manchester, on payment of a deposit of £2 2s. Sealed tenders, endorsed "Tender for Fireclay Goods," addressed to the Chairman of the Gas Committee, must be delivered at the Gas Offices, Town Hall, Manchester, on or before Dec. 13.

Dec. 13. Nottingham.—*Supply of the following stores* and materials, the contracts to commence on Jan. 1, and to terminate on Dec. 31, 1907 :—(1) Cement, (2) blue lias lime, (3) red bricks, (4) blue bricks, (5) timber, (6) earthenware pipes, &c., (8) iron castings, iron gulleys, &c., (9) Yorkshire flags, kerbs, &c., (10) granite setts, kerb and broken granite, (11) broken slag, chippings, &c., (12) river gravel. Forms of tender may be obtained by applying to A. Brown, M.Inst.C.E., city engineer, Nottingham, on payment of 5s. each. Patterns and samples may be inspected at the Eastcroft Depôt, London Road, Nottingham. The Committee will not consider any tender except those on the authorised form of tender, which must be sent to S. G. Johnson, town clerk, Guildhall, Nottingham, on or before Dec. 13. Fair wages clause.

TOO LATE FOR CLASSIFICATION.

Dec. 10. Leeds.—*Supply of the following* until March 31 :—Timber, ironmongery, plumbers' materials, builders' materials. Particulars, schedules and forms of tender may be obtained at the City Engineer's Office, on payment of a deposit of £1 1s. Tenders, properly endorsed, should be received at the City Engineer's Office, not later than 10 a.m. on Dec. 10.

Dec. 10. Nottingham.—*Erection of a bandstand* at the Arboretum, for the Public Parks Committee. Plans may be seen and copies of the bill of quantities and form of tender obtained from F. B, Lewis, city architect, Guildhall, on payment of a deposit of £1 1s. Sealed tenders, endorsed "Tender for Bandstand, Arboretum," to be delivered to S. G. Johnson, town clerk, Guildhall, Nottingham, at or before noon on Dec. 10. Fair wages clause.

Dec. 12. Hull.—*Erection of emigrants' room,* &c., Paragon Station, Hull, for the Directors of the North-Eastern Railway. Plans and specifications may be seen, and quantities and further information obtained on application to W. Bell, the Company's architect, at York; duplicate plans may also be seen at the Station Master's Office, Paragon Station, Hull. Quantities supplied on personal application to parties tendering for the whole of the work. Sealed tenders, marked "Emigrants' Room, &c., Hull," to be sent to the Secretary at York not later than noon on Dec. 12.

Dec. 15. Longton.—*Supply for twelve months ending Dec. 31, 1907, of the following:*—Broken granite and granite setts, Macclesfield setts, stone kerbs, cast-iron work, ironmongery, lime, Portland cement, blue paving bricks, earthenware pipes, wheelwright's work. Specifications and forms of tender may be had on application to J. W. Wardle, Assoc.M.Inst.C.E., borough surveyor, Court House, Longton, Satffordshire. Tenders under seal, endorsed "Tender for Granite, &c.," as the case may be, are to be left with him on or before Dec. 15.

Dec. 17. Flemington.—*Construction of a goods yard* and relative works at Flemington, Motherwell, for the Directors of the Caledonian Railway Co. Drawings may be seen at the office of the Company's Engineer, Buchanan Street Station, Glasgow, where copies of the specification and schedule may be obtained on payment of £2 2s. An asistant engineer will attend at Flemington Station on Thursday, Dec. 6, at 11 a.m., to accompany contractors over and point out the line of the works. Sealed tenders, endorsed "Tender for Flemington Goods Yard," to be lodged with J. Blackburn, secretary, Caledonian Railway Company's Offices, 302, Buchanan Street, Glasgow, on or before Dec. 17.

New London Buildings

At yesterday's meeting of the London County Council the Building Act Committee reported the following applications under the London Building Act, 1894, their recommendations as to consent or refusal being appended in *italics:*

One hundred and six buildings at Marmadon Road, and eight buildings at Church Manorway, Plumstead, on the application of J. O. Cook, on behalf of T. H. Driver. (*Consent.*)

Four houses with porches on the southern side of Love Walk, Camberwell, westward of No. 1, with a forecourt boundary at less than the prescribed distance from the centre of Love Walk, on the application of J. Ham. (*Consent.*)

Building on the site of No. 8, Allen Street, Goswell Road, Finsbury, at less than the prescribed distance from the centre of the roadway of the street, on the application of E. B. I'Anson. (*Consent.*)

Two houses with shops on the north side of Evelina Road, Nunhead, on a site between Kirkwood Road and Grimwade Crescent, on the application of N. Pellew. (*Consent.*)

Projecting hoods in front of two houses on the north-eastern side and four houses on the south-western side of Bracknell Gardens, Hampstead, on the application of W. A. Burr, on behalf of J. Tomblin. (*Consent.*)

Projecting electric letter sign in front of the Horseshoe Brewery, Tottenham Court Road, on the application of W. T. Foster, on behalf of Meux's Brewery Co., Ltd. (*Consent.*)

One-storey shop in front of No. 11, Brownhill Road, Catford, on the application of Norfolk & Prior, on behalf of Mrs. E. E. Reader. (*Consent.*)

Porches to twenty-one houses on the western side of Manor Lane, Lee, northward of the bridge over the river Quaggy, on the application of G. A. Lansdown, on behalf of W. A. Scudamore & Sons. (*Consent.*)

Eight houses, with porches, half timber work, barge boards and oriel windows, on the western side of Hither Green Lane, Lewisham, on the application of H. Lewis Upham, on behalf of S. Wood. (*Consent.*)

Bay-windows in front of Nos. 21, 23 and 29, Glenshiel Road, Eltham, on the application of J. J. Bassett, on behalf of A. Cameron Corbett. (*Consent.*)

Two iron and glass shelters in front of the Baker Street and Waterloo Railway Station, the Criterion Restaurant, and the Criterion Theatre, on the southern side of Piccadilly, on the application of W. Woodward, on behalf of Spiers & Pond, Sir Charles Wyndham, and the Baker Street and Waterloo Railway Co. (*Refusal.*)

Stabling at the rear of No. 60, Wood Lane, Hammersmith, to abut upon a roadway leading out of the south-east side of Wood Lane, on the application of L. S. Haskins, on behalf of Mrs. S. Taylor. (*Consent.*)

Irregular open space at the rear of the Hammersmith District Railway Station, The Broadway, Hammersmith, with a projecting shelter in front of such station, on the application of C. H. King, on behalf of the Metropolitan District Railway Co. (*Consent.*)

Friends' meeting-house on the site of Stamford Lodge, Heath Street, Hampstead, on the application of F. Rowntree, on behalf of the Hampstead Preparation Unity of the Society of Friends. (*Consent.*)

Six cottages on the site of Nos. 71 to 79, George Row, Bermondsey, on the application of J. M. Kennard, on behalf of Mrs. Portlock. (*Consent.*)

One-storey building abutting upon St. Margaret's Court, Red Cross Street, Southwark, on the application of Barlow, Roberts & Thompson. (*Consent.*)

Addition to a coach-house on the eastern side of Shepherd's Walk, Rosslyn Hill, Hampstead, on the application of F. R. Hasluck, on behalf of W. Clark. (*Consent.*)

Building at the rear of No. 184, Long Lane, Bermondsey, on the application of J. M. Kennard, on behalf of G. Brenner. (*Consent.*)

Building on the site of No. 19, Dod Street, Limehouse, to exceed in height the width of the street and with a pier at less than the prescribed distance from the centre of the roadway of such street, on the application of H. Herrmann, Ltd. (*Consent.*)

Two iron gangways to connect two warehouses over the public way of Pickle Herring Street, Rotherhithe, on the application of Ashby & Horner, on behalf of W. H. Nesbitt. (*Consent.*)

Block of working-class dwellings on the western side of Hampstead Road, St. Pancras, adjoining the London and North-Western Railway cutting, with an irregular open space about such building, on the application of Joseph & Smithem, on behalf of the London and North-Western Railway Co., Ltd. (*Consent.*)

Buildings on the site of Nos. 89 and 91, Wardour Street, and Nos. 1 to 13, Downs Place, Strand, on the application of J. P. Briggs, on behalf of I. Moss-Vernon. (*Refusal.*)

Building upon the site of Nos. 7, 8 and 9, Coventry Street, and 60, 61, 62, 63 and 64, Rupert Street, on the application of W. J. Ancell, on behalf of J. Lyons & Co., Ltd. (*Refusal.*)

Uniting of two warehouse buildings on the western side of James Street, Kensington, by means of openings on the basement, ground, first and second floors, without the buildings so united being wholly in one occupation, on the application of Crickmay & Sons, on behalf of Bowerman & Forward. (*Consent.*)

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List No. 1 of DRAWING OFFICE REQUISITES.

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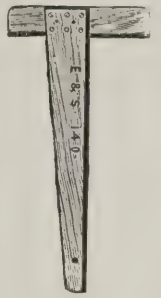

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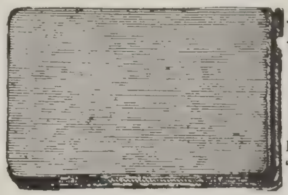

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22 × 17	Royal	**2/3**
24 × 19	Half Double Elephant	**3/-**
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31 × 23	Imperial (full size)	**4/9**

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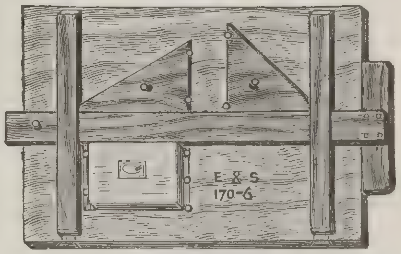

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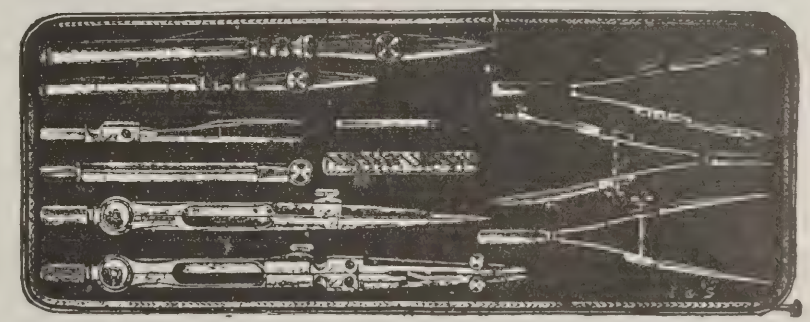

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Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—adjudication.]

DURING THE WEEK ending November 30th eighteen failures in the building and timber trades in England and Wales were gazetted.

S. BARR, builder, Chelsea. Adj., Nov. 20.

A. SMITH, builder, Twickenham. R.O., Nov. 23.

J. W. COATES, builder, Streatham. R.O., Nov. 22.

W. J. WYATT, builder, Gravesend. Gross liabilities £3,946.

F. C. IRONMONGER, timber merchant, Harborne. R.O., Nov. 19.

H. WILLIAMS, builder and contractor, Tranmere. Adj., Nov. 17.

W. DIXON, builder and contractor, Strines. R.O., Nov. 19.

D. EDWARDS, builder and contractor, Ynysddu. R.O., Nov. 23.

KERSLAKE & SON, builders, Exeter and Okehampton. Deficiency £788.

J. HADLEY, brick manufacturer, Rowley Regis. Liabilities £3,840; deficiency £566.

ALFRED HUDSON & CO., builders and contractors, London. Liabilities £33,350; assets £440.

E. A. SPARKSMAN, builder, Hammersmith. P.E., London Bankruptcy Court, Dec. 6, at 11.30.

I. MANN, painter and decorator, Tipton. First meeting, O.R.'s, Dudley, Dec. 5, at 11. P.E., Dudley C.C., Dec. 6, at 11.

F. THOMPSON, decorator, Sheffield. First meeting, O.R.'s, Sheffield, Dec. 6, at 12.30. P.E., Sheffield C.C., Dec. 6, at 2.

C. CROWE, builder, Tottenham. First meeting, 14, Bedford Row, W.C., Dec. 6, at 3. P.E., Edmonton C.C., Jan. 7, at 11.30.

T. FREE, contractor, Bristol. First meeting, O.R.'s, Bristol, Dec. 5, at 12. P.E., Guildhall, Bristol, Dec. 21, at 12. R.O., Nov. 22.

W. H. THORPE, builder, Hastings. First meeting, C.C., Hastings, Dec. 11, at 12,30. P.E., Town Hall, Hastings, Dec. 11, at 11. R.O., Nov. 22.

A. STENT, painter and decorator, Wolverhampton. First meeting, O.R.'s, Wolverhampton, Dec. 5, at 12. P.E., Wolverhampton C.C., Dec. 19, at 11.

Coming Events.

Wednesday, December 5.

BUILDERS' FOREMEN AND CLERKS OF WORKS' INSTITUTION.—Meeting at 8 p.m.

Thursday, December 6.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—Mr. C. B. Howdill, A.R.I.B.A., on "Stained Glass," at 6.30 p.m.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.—Mr. R. J. P. Briggs on "Boilers and their Accessories," at 8 p.m.

Saturday, December 8.

INCORPORATED BRITISH INSTITUTE OF CERTIFIED CARPENTERS.—Annual general meeting, Carpenters' Hall, London Wall, at 6.30 p.m.

JUNIOR INSTITUTION OF ENGINEERS.—Visit to Honor Oak reservoirs of the Metropolitan Water Board, at 3 p.m.

NORTH OF ENGLAND INSTITUTE OF MINING AND MECHANICAL ENGINEERS.—Meeting at Newcastle-on Tyne, at 2 p.m.

Monday, December 10.

LONDON INSTITUTION.—Rev. J. Stephen Barras, M.A., on "The Churches of the City," at 5 p.m.

INSTITUTE OF SANITARY ENGINEERS.—Half-yearly general meeting, at 4 p.m. Annual dinner, at 6.30 p.m.

Tuesday, December 11.

ARCHITECTURAL ASSOCIATION OF IRELAND.—Mr. Frederick Batchelor, F.R.I.B.A., on "Reinforced Concrete Construction," at 8 p.m.

INSTITUTE OF SANITARY ENGINEERS.—Mr. W. J. Dibdin, F.I.C., F.C.S., on "Sewage Disposal," at 7 p.m. (Students' lecture.)

Wednesday, December 12.

NORTHERN ARCHITECTURAL ASSOCIATION.—Mr. G. A. T. Middleton, A.R.I.B.A., on "Continental Romanesque and Gothic Detail," at 7.30 p.m.

ROYAL SANITARY INSTITUTE.—A discussion on "The Advantages and Disadvantages of Heating Buildings by Gas Stoves of Various Types," at 8 p.m.

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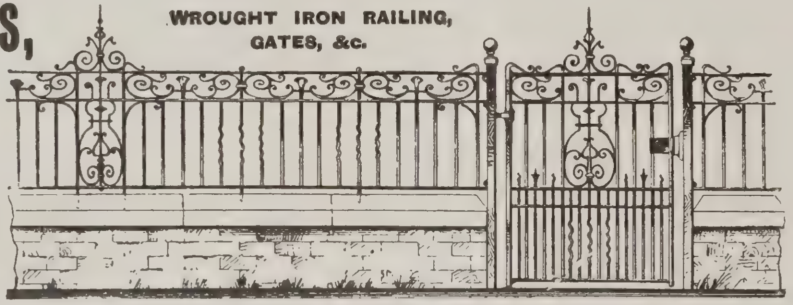
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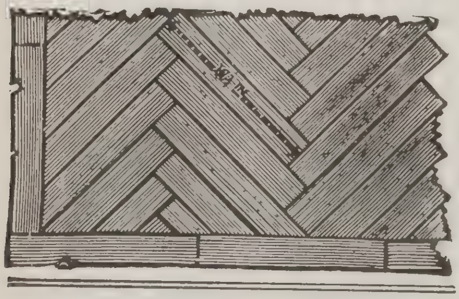

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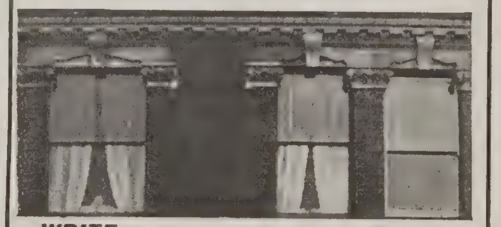
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THE BUILDERS' JOURNAL

AND ARCHITECTURAL ENGINEER.

December 5, 1906.

CONCRETE AND STEEL SUPPLEMENT (MONTHLY).

CONCRETE AGGREGATES.

By Thomas Potter.

(Concluded from page 80.)

Mr. Grant found that at the end of a year blocks of concrete made with one part of cement to six parts of Thames ballast broke under a compressive strain of 56 tons; one of blue lias lime and six of ballast, 6 tons.

The ratio of the increase in the strength of concrete can only be arrived at, so far as my knowledge goes, by a knowledge of the increase of the strength of cement, in the absence of any published records relative thereto. Mr. Grant made ten experiments with neat cement and ten with one of cement to one of sand, with the following result:—

Experiment No. 5.

Age.	Neat cement 2¼ sq. ins.	1 cement, 1 sand 2¼ sq. ins.
	lbs.	lbs.
7 days	817	353
3 months	1,055	547
6 do.	1,176	640
9 do.	1,219	692
12 do.	1,229	716
2 years	1,324	790
4 do.	1,312	818
6 do.	1,308	819
7 do.	1,327	863

But the ratio of increase in the strength of concrete may possibly be more correctly judged when the sand is in larger proportion to the cement. Mr. Grant made 960 experiments in the years 1862-3 with one part of cement to three parts of sand, the average result being:—

Experiment No. 6.

Age.	Per cent. of strength.
1 week	6.07
1 month	8.53
3 months	15.13
6 ,,	23.74
12 ,,	29.90

We may conclude from these and experiments of a similar character that Portland cement concrete at one month old does not approximately reach more than 33 per cent. of its ultimate strength, and at three months 50 per cent. The nature of the aggregates and the quality of the cement will obviously influence the result to a large extent, but the assumption is that both are of the best description.

At this point it may be well to call attention to

the floor and other tests

for concrete specified in many cases at the present time to be made at a month, when they are supposed not only to stand the maximum stress but a factor of safety in addition. It is a question whether many floors which have undergone this test have not been permanently weakened through over-strain. No floor should be tested under three months, and if it will stand the specified test then it will undoubtedly be 30 to 50 per cent. stronger in course of time, always assuming the best and proper materials are employed. The common assumption appears to be that concrete must possess a considerable margin of strength over and above all possible requirements, in case the strength might diminish hereafter; whereas—always again assuming that materials and workmanship are good—it is about the only material in a building that goes on increasing in strength for years.

Where a choice permits

it is worth noting that certain aggregates allow a smaller proportion of cement to be used therewith than others, without a corresponding diminution of strength, as Mr. Grant proved by the following experiment, in which the proportion was one of Portland cement to 10 parts of various aggregates, the blocks measuring 12-ins. cube, and tested at the end of a year:—

Experiment No. 7.

Crushed at tons.		Aggregates 10 to 1.
Air.	Water.	
48½	4	Ballast
50	68	Granite
53	75	Glass
60	52	Slag
72½	78	Portland Stone
70	98	Flints
90	100	Pottery

The result of this experiment proves that flints make concrete at one to ten nearly equal in strength to pottery, while glass is superior to slag.

These results are considerably at variance with experiments made with one of cement to six of an aggregate. The results of the above tests, which were the averages of a large number of experiments, somewhat upset previous experiments and all theory as to the strength of concrete made with different aggregates, for flint takes nearly the top place, Portland stone the third, and but little superior to glass, while Thames ballast comes last.

Non-absorbent Aggregates.

Flint surfaces are of a glassy, impervious nature, and this experiment (No. 7) tends to prove that aggregates of a non-absorbent character make better concrete when the proportion of cement is low than pervious ones. Flints, whether obtained from chalk strata or picked from the surface of agricultural lands having a chalk subsoil, should be washed and broken with a crusher—hand-breaking is quite useless for the purpose—and in this way an aggregate of a suitable nature and consistency is obtained without the admixture of any other materials; but the washing is better and more quickly performed after they are crushed, as the clay, marl, or chalk which adheres thereto is broken up into minute particles and much more readily got rid of, and the washing is more easily and economically performed on the mixing board, laid to a slight inclination, at the time the concrete is required. If the inclination is too great, the sandy element is carried away with the water; the boards should be adjusted to avoid this loss.

River gravel, when obtained from sluggish streams, has often fine muddy clay, washed in from the banks, attached thereto. This should also be eliminated by washing. Thames ballast is not always of one quality, as every London builder knows; it depends upon what part of the river it is obtained from.

Ashes and Breeze.

Ashes from locomotive and engine furnaces generally make excellent aggregates as before stated, if not intermixed with engine-room sweepings and coal dust, while coke breeze, whether of the ordinary kind or pan breeze, is scarcely inferior. The word "breeze" has been used to describe other materials beside coke residue—the screened ash-bin refuse of private houses and public buildings, for instance—so that a clear understanding is often necessary as to what the breeze is composed of, and the source from which it is obtained; the different descriptions of coal produce, too, very different qualities of coke breeze.

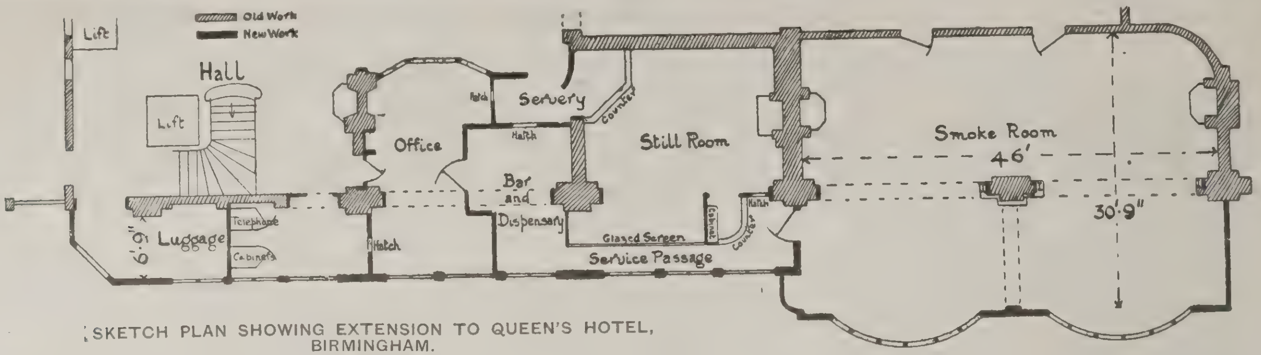
Old bricks

from buildings in course of demolition make good concrete if broken with a crusher, but not if hand-broken. They should be roughly cleared of old mortar—plastering mortar especially—while, if smoked and soot-laden, they should only be used in foundations. If used for walls, floors, or ceilings where the latter are formed by plastering direct on the concrete, stains will inevitably appear in course of time.

Old tiles, slates and similar materials are, as a rule, unfit for an aggregate; they are unshapable and impregnated with smoke and impurities.

Chalk

from the bottom stratum makes a fairly good aggregate; the upper or soft stratum is of too soft a nature, but I built cottages therewith many years ago, two storeys high, having concrete upper floors, the walls 12ins. thick, which are and have always been quite dry and left nothing to be desired. On one occasion I erected a specimen wall of soft chalk concrete, 4ft. in height and 9ins. in thickness, in the shape of a right angle on plan, measuring 5ft. each way, the concrete being one to seven. The chalk was screened through a 2-in. mesh sieve, and the portion that passed through a ⅜-in. mesh abstracted, and a coarse sand from crushed brickyard débris substituted. At the end of six months a chain was attached to one side at a point halfway in a straight line from the angle; a powerful cart horse was unable to pull it asunder. The weather had no effect upon it, although not cemented on the face or covered on the top, or otherwise protected, and after a year had elapsed it was broken down with sledge hammers. Blocks of chalk lying alongside were reduced to powder by the winter's frost, but blocks of chalk concrete were unaffected thereby. The cement appeared to have permeated the chalk and rendered it frost-proof. As an excellent material for building walls of military huts, &c., for the camp on Salisbury plain, chalk



SKETCH PLAN SHOWING EXTENSION TO QUEEN'S HOTEL, BIRMINGHAM.

was available everywhere in that district; walls could have been erected cheaply and by the military encamped there, and would have been warm and dry, instead of which cold and insanitary iron and match-boarded structures were erected in almost endless number.

Specifications often describe aggregates to be composed of different materials in certain proportions, such, for instance, as five parts of clinkers or broken-brick débris, and one part of sand or coke breeze; but the object is not clear. We seldom hear of cement mortar being made with cement and two different kinds of sand. In my experience the best aggregates are those in which the material is of one description throughout; if, however, Thames or other sand is added, through an insufficiency of the smaller element, that is a different matter, and cannot, perhaps, be avoided.

Many failures with concrete have taken place from causes unknown at the time it was used. Slag, unless it has been allowed time for æration by exposure to the atmosphere for a year at least to get rid of the sulphur contained therein, will disintegrate the concrete. Many failures have happened from using slag not sufficiently ærated, otherwise it is one of the best of aggregates.

Aggregates by rail have been conveyed in trucks previously used for the conveyance of lime, portions of which have got intermixed therewith, and, being unnoticed, have caused the concrete to blow or burst. This is not of frequent occurrence, but has happened. The aggregate should not be deposited near a lime shed, nor where plasterers are running lime for plastering, as pieces of unslaked lime or lime core screenings may inadvertently find their way among the concrete material. Numerous failures have occurred through pieces of lias limestone having passed through the furnaces of locomotives and mixed with the ashes which were afterwards used for making concrete. It is the practice on some lines of railways to give the drivers gratuities when the consumption of coal is below or not over the average, and where lines pass through lias limestone districts the drivers have found that lumps of limestone, when mixed with the coal, economise the latter. I have seen a large flight of concrete stairs and floors completely wrecked as a result.

DETAIL OF CANTILEVERS, QUEEN'S HOTEL, BIRMINGHAM.

Thames ballast and sand often contain pieces of **Coal** which may have been thrown overboard, or in some other way got mixed therewith. It used to be thought that the coal expanded and burst the concrete, but late trials do not confirm this view, although "blisters" in cement facing to walls have been traced to minute pieces of coal forming the cores thereof having burst the cement. This explanation of opposite results I am unable to give.

Obviously, aggregates for floors and walls—the former more especially—should be fire-resisting to a high degree, and the best fire-resisting aggregates have passed through fire or have withstood a great heat without disintegration, such as slag, furnace ashes, coke breeze, clinker, brick and tile yard débris, and burnt-clay ballast. Some of the floors tested for fire-resistance by the British Fire-Prevention Committee had Thames sand mixed with otherwise good fire-resisting materials. Thames sand, being the finer portion of flints formed by attrition, is a bad material to withstand fire, and the results were less successful than probably they otherwise would have been.

Captain Shaw, at one time Superintendant of the Metropolitan Fire Brigade, was in the habit of **cautioning firemen** from entering buildings on fire which had concrete floors made with Thames ballast and Thames sand. These were in the habit of collapsing when a fire occurred and without any warning.

The use and selection of aggregates for concrete purposes has too commonly been considered of small consequence, and that anything—clean or dirty—will answer the purpose equally as well, an idea which to some extent I formed myself very many years ago, but soon discovered that, like other things in life, we learn more from failure than from success.

NOVEL CANTILEVER CONSTRUCTION.

A great factor in travel is a good hotel at the end of the journey, and this the London and North-Western Railway has in Birmingham. The accommodation, however, until recently, was inadequate, and the Company some time ago decided upon extending the Queen's Hotel, which adjoins their well-known New Street Station. The extension was chiefly designed to enlarge the smoke-room, as it was felt that this room was insufficient for the hotel, in which general improvements in the service had lately been effected, resulting in the hotel being now one of the most favoured in the city. At the same time some of the service departments of the hotel also needed improving, and this has also been effected. The smoke-room and the service rooms in question abutted upon the station, from which light was obtained. The only way in which to secure the extensions, therefore, appeared to be to encroach upon the station, but the London and North-Western Railway estate department were debarred from obstructing the platform with columns in order to support the extension on the first floor (which constitutes the main floor of the hotel).

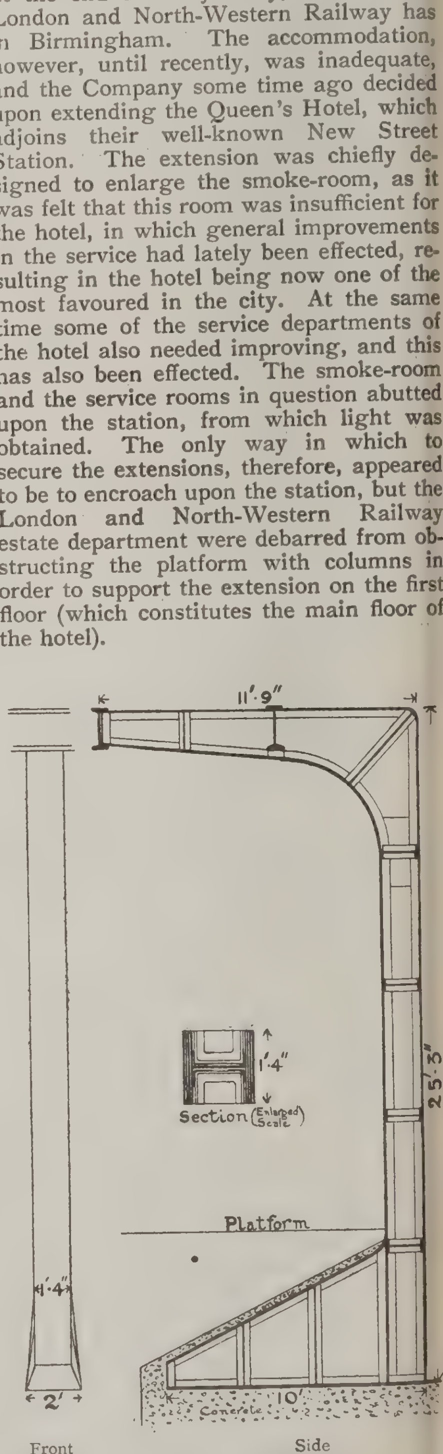
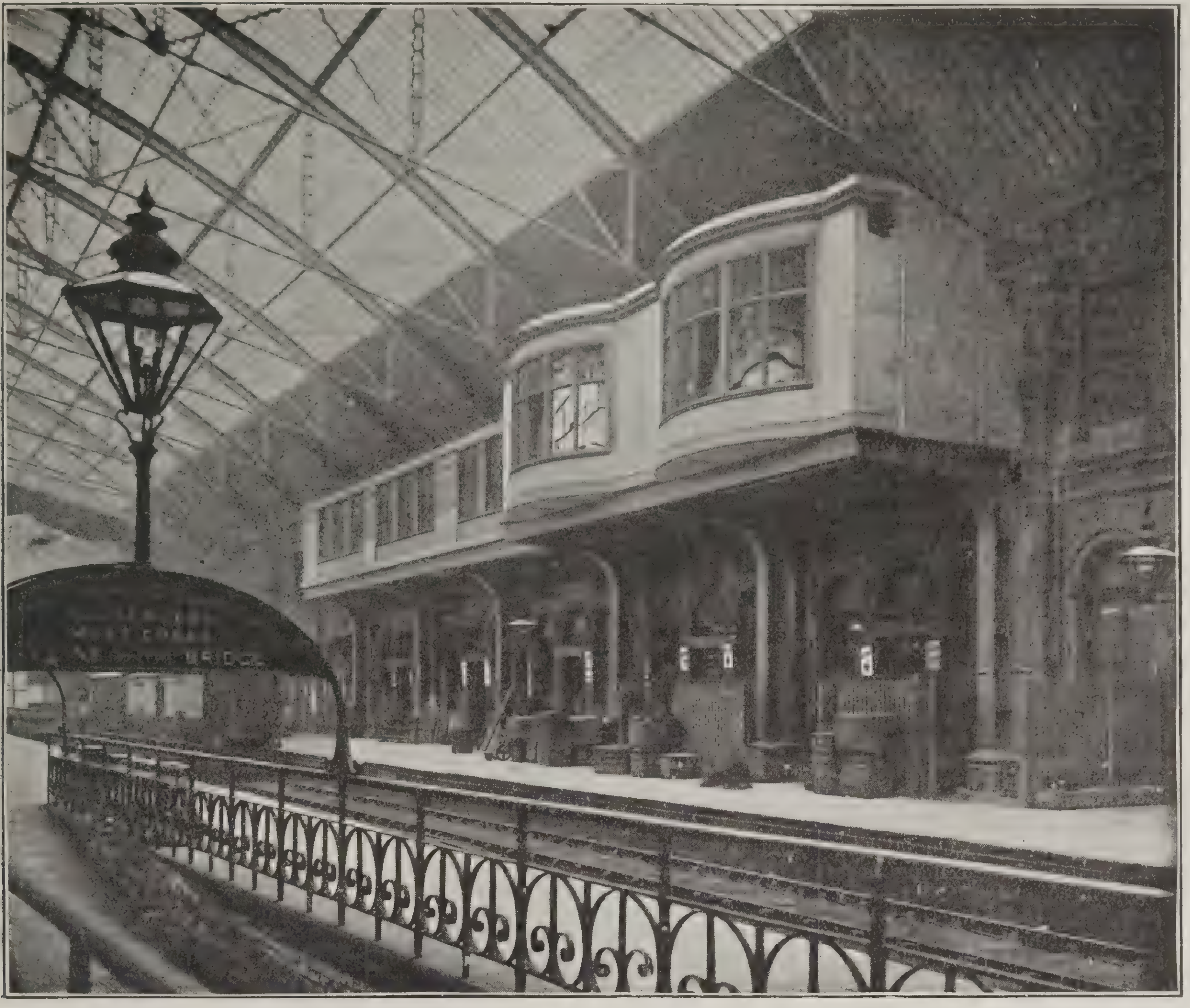


DIAGRAM OF CANTILEVER CONSTRUCTION, QUEEN'S HOTEL, BIRMINGHAM.



QUEEN'S HOTEL, BIRMINGHAM: GENERAL VIEW OF THE EXTENSION.

Whatever extension was to be done, therefore, must, on the one hand, not interrupt the clear space of the platform below, nor cut into the roof or prevent every part of the latter being open for inspection, re-painting and repair. The only way out of the difficulty clearly was to cantilever the extension over the platform. If, however, this were to be done by the usual method, not only would the interior of the hotel have to be seriously disturbed, but the conduct of the hotel would have been thrown out of gear for a considerable time and the disturbance would have resulted in considerable loss in custom. A way out of all the difficulties was eventually arrived at by the adoption of a novel form of cantilever construction. The cantilevers were built shaped like a bracket, thus], the details of which will be comprehended by inspection of the diagram and photographs which we publish. This job is the first occasion, so far as we know, where this form of cantilever has been adopted as a means of extending a building over a footway, and it offers an easy solution to a difficulty which is often experienced; by its adoption the interior of a building can practically be preserved against disturbance.

As will be gathered from the general photograph and from the sketch plan showing the alterations and extensions, the old front wall of the hotel was divided into bays by piers carrying the roof trusses. Each bay was sub-divided below by three arched openings, while above, on the first floor of the building, there were three openings in each bay having straight heads. The ground floor was occupied by cloak-rooms and other offices for the use of passengers and officials using the station, and the hotel was situated on the floor above.

The three openings between piers on the first floor were cut away in each of the four bays, as will be seen from the sketch plan, and three square steel frames were constructed to support the wall above by placing stanchions against the old piers riveted to joists below and joists above. These openings were closed with wood boarding practically without encroaching upon the existing space, so that the rooms could be used by the visitors and by the hotel officials without further disturbance, while the greater amount of the work was in progress.

Excavations were then dug in the platform to allow the cantilevers to be placed in position and concrete foundations to be constructed. The cantilevers being then placed upon their concrete foundations were themselves embedded in concrete below the platform level. The base of each cantilever was widened out to 2ft. so as to secure a wider bearing upon these foundations, and to increase its stability. 1¼-in. bolts, 3ft. 6ins. long, were also embedded in the concrete foundations and bolted to the feet of the cantilevers, so as to assist in securing them, while the cantilevers were also bolted through the existing piers, so as to assist in preventing any possibility of lateral movement. The larger cantilevers supporting the smoke-room extension are three in number and project 11ft. 9ins., allowing the construction of a room projecting over the platform to the extent of 16ft. The three smaller cantilevers had only 7ft. projection. The feet of the larger cantilevers project 10ft. and the smaller cantilevers 7ft. under the platform. As will be seen from the diagram the cantilevers are 25ft. 3ins. high above the foundations, and the upright stanchion portions are 1ft. 8ins. by 1ft. 4ins. The three larger cantilevers had this stanchion portion built up of a ¾-in. web plate riveted to four 4-in. by 4-in. by ½-in. angles, which are again riveted to the flanges, each of which is composed of four ½-in. plates. The flanges of the stanchion portions of the smaller cantilevers are much lighter, being composed each of two ⅜-in. plates. The cantilevers, as will be seen, have stiffeners at various points. The heads of the larger cantilevers have riveted at their outer ends, 6ft. 6ins. from the face, or 5ft. 3ins. from the back of this portion of the cantilever, an 18-in. by 7-in. by 75-lb. rolled steel joist, which serves to carry the front wall and projecting bow windows of the smoke-room extension. An intermediate rolled steel joist (of same size) runs parallel with the front joist and in order to support the small 6-in. by 3-in. by 12-lb. rolled steel joists of the concrete floor of the extension. The smaller cantilevers supporting the extension of the service portion carry only one 18-in. by 7-in. rolled steel joist—namely, at their outer extremities.

As regards the construction of the smoke-room walls, &c., light iron stanchions composed of 7-in. by 3¾-in. by 18-lb. rolled steel joists are erected at the corners, while in the centre between the two bow windows two joists on end, of the same size, are placed side by side. At the points where the bow windows begin two tee irons are placed back to back, and single tee irons are erected in between. These tee-iron and steel-joist stanchions are connected at their feet by 2-in. by ⅜-in. bars placed on edge and riveted to the tee iron stanchions. 2ft. 6ins. higher up similar bars connect the stanchions, and light tee irons measuring 2ins. by 2ins. by ¼in., are riveted between these bars. Similar framing is adopted in the portion of the walls above the glazing of the windows. These various members serve to reinforce the walls, which are constructed of breeze concrete proportioned 1 to 4. A similar construction was also adopted in the service portion for the reinforcement of the walls, which are likewise constructed of breeze concrete. The whole of the walls are 5ins. thick.

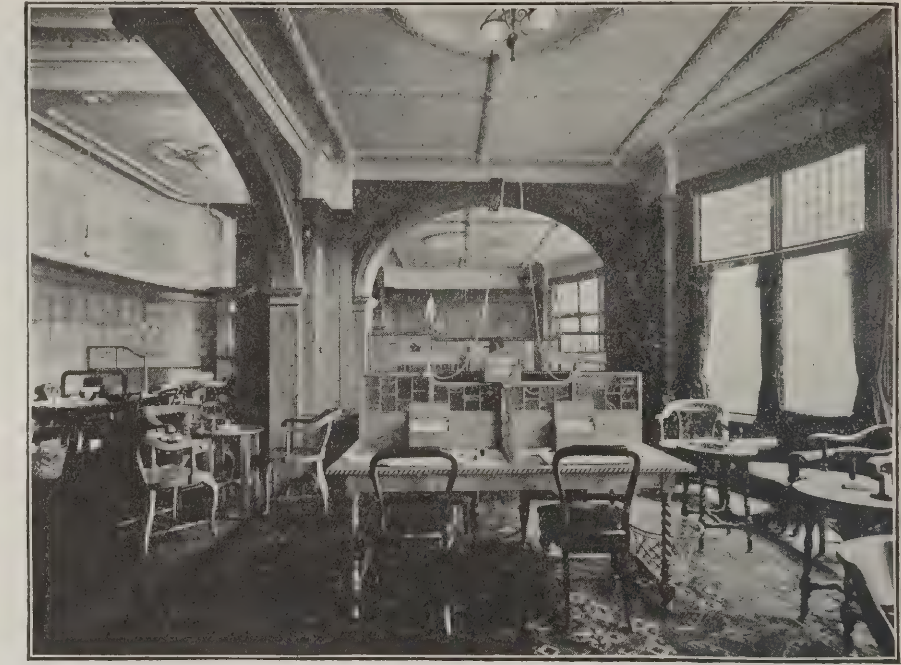
Joists embedded in the concrete floor are anchored down into the walls by means of bolts 15ins. long, so as to provide additional resistance to leverage, and the roof is also tied into the walls.

The interior of the smoke-room has been decorated in fumigated oak with ebony and pewter inlay by Messrs. Warings, Ltd. A deep frieze surrounds the old portion of the smoke-room, which is from 16ft. to 17ft. high, and the ceilings have also been richly decorated, as will be seen from the photograph of the interior which we give. The extended portion of the smoke-room, and also of the corridor, is only 12ft. high, it being impossible to go higher in consequence of the position of the station roof.

The arch shown in the centre of the photograph of the interior of the smoke-room was adopted as a means of decoratively treating the tie-bar of one of the roof trusses which comes below the ceiling. The left-hand portion of this arch, therefore, is simply a boxing around this tie-rod, which is open for inspection and re-painting above. The flat arches between the old piers, shown end-on in the view, are decorative and not constructive, being employed to be in harmony with the treatment adopted to deal with the necessity of the tie-bar coming below the ceiling.

The whole of the extension work was carried out to the design and under the supervision of the Estate Department of the London and North-Western Railway, the steelwork being designed by the Engineering Department of the railway and constructed by Messrs. Jesse Tildesley, Ltd., of Crescent Works, Willenhall, while Mr. E. H. Thompson, of 110, Bradford Street, Birmingham, was the general contractor.

Reinforced Concrete in Frosty Weather.—An interesting experiment is to be tried in the construction of a reinforced concrete bridge at Saskatoon for the Canadian Pacific Railway. The work is to be executed through the winter. The danger from frost is to be avoided by heating the concrete and preventing the work being frozen while setting. The contract was decided at the end of November, and it is confidently expected that the bridge will be ready for use by May 1st next.



QUEEN'S HOTEL, BIRMINGHAM: THE NEW SMOKE-ROOM.

SAN FRANCISCO'S NEW BY-LAWS.

New by-laws have recently been ordained for San Francisco regulating the construction of the buildings which will be erected in that city, and the enlargement, alteration and maintainance of those which have escaped the earthquake and fire. These by-laws contain a number of clauses regulating reinforced concrete construction, which are of considerable importance as showing the latest views of American municipal authorities upon the subject. The by-laws will, no doubt, be consulted by the framers of by-laws in this country for this class of construction. Such by-laws are already urgently called for by the great strides which have been made of recent years in steel and concrete construction. The chief clauses referring to the subject are as follows :—

BY-LAWS REGARDING REINFORCED CONCRETE CONSTRUCTION.

Section 164.—All reinforced concrete shall be constructed in accordance with the following provisions :—

The term "reinforced concrete," as used in this ordinance, shall be understood to mean an approved concrete mixture reinforced by steel of any shape, so combined that the steel will take up the tensional strain, and assist in the resistance to shear.

Stress.

Section 165.—Reinforced concrete construction shall be of such nature that the stresses can be calculated according to the accepted formulas of modern concrete engineering practice.

Concrete—Mixing of ; Method of Testing.

Section 166.—The concrete shall be mixed in the proportions of not less than one of cement to six of aggregates, consisting of sand and gravel or broken stone of 1in. major dimensions. The proportions shall be such that the resistance of the concrete to crushing shall not be less than 2,000lbs. per sq. in. after hardening for twenty-eight days. The tests to determine this value shall be made by a competent engineer under the direction of the Board of Public Works. The concrete used in reinforced concrete construction shall be what is usually known as a wet mixture.

Steel.

Section 167.—All steel with an elastic limit exceeding 40,000lbs. shall have a mechanical bond with the concrete.

Method of Reinforcing.

Section 168.—All reinforcing steel shall be completely enclosed by the concrete, and such steel shall be nowhere nearer to the surface than one and one-half times the diameter of such reinforcing steel bar or rod or other shape, but never less than 1in. The steel in beams or girders shall be so disposed that there shall be not less than one and one-half times the thickness of the steel in concrete between the steel, and where the number of bars used cannot be placed in one plane they shall be placed in two or more planes.

Reinforced concrete shall be so designed that the stresses in concrete and the steel shall not exceed the following limits :—Extreme fibre stress on concrete in compression, 500lbs. per sq. in.; shearing stress in concrete, 75lbs. per sq. in.; concrete in direct compression, 450lbs. per sq. in.; concrete in spirally-wound columns, 700lbs. per sq. in.; tensile stress in steel, one-third of the elastic limit; shearing stress in steel, 10,000lbs. per sq. in.

The adhesion of concrete to steel shall be assumed to be 75lbs. per sq. in. of surface where bars are three-quarters of an inch or less in diameter, and proportionately less in bars of a diameter greater than three-quarters of an inch.

The ratio of the moduli of elasticity of concrete and steel shall be taken as 1 to 15.

The following assumption shall guide in the determination of the bending moments due to external forces :—Beams and girders shall be considered as simply supported at the ends, no allowance being made for continuous construction over supports. Floor plates, when constructed continuous and when provided with reinforcement at the top of plate over the supports, may be treated as continuous beams, the bending moment for uniformly distributed loads being taken as not less than W L divided by 12; the bending moment may be taken at W L divided by 20 in the case of square floor plates which are reinforced in both directions and supported on all sides. The floor plate to the extent of not more than five times its depth may be taken as part of that beam or girder in computing its moment of resistance and the beam and slab must be built at the same time as a unit.

W—the total load.

L—the distance between centres of support.

The moment of resistance of any reinforced concrete construction under transverse loads shall be determined by formulas based on the following assumptions :—

(*a*) The bond between the concrete and steel is sufficient to make the two materials act together as a homogeneous solid.

(*b*) The strain in any fibre is directly proportionate to the distance of that fibre from the neutral axis.

(*c*) The modulus of elasticity of the concrete remains constant within the limits of the working stresses fixed in this ordinance.

The dimension of such a beam or girder and its reinforcement shall be determined and fixed in such a way that the strength of the metal in tension shall measure the strength of the beam or girder. If the concrete in compression, including the allowable concrete in adjoining floor construction, does not afford sufficient strength for that purpose, the compression side of the beam or girder in question shall also be reinforced with metal.

All beams or girders shall be reinforced with metal if necessary for shear. Other reactions, if necessary, shall likewise be reinforced.

Neither the reinforcing metal nor the concrete shall be subjected to combined stresses so as to exceed in combination the stresses allowable separately.

Wherever possible, beams and girders and also their intermediate floor construction shall be made continuous. Reinforcing metal shall be used for that purpose in the top of all connecting members at the point of support, and it shall be sufficient both in section and length to prevent fracture at the point of support where the connecting members are carrying twice their calculated loads.

The reinforcing metal in the bottom of a floor slab may be deflected to the top of the slab along the line of support, or separate reinforcing material may be used for the reinforcement in the top of the slab. In either case, however, if a part of the slab is considered as a part of the beam or girder, the reinforcing material used in the slab must cross the full width, both of the beam or girder and the part of the slab so considered.

The centering for the beams and girders of a floor shall be constructed in conjunction with the centering for the floor slabs which they support, and no centering shall be removed until all parts of the finished floors are strong enough to support themselves and the loads that may come upon them during construction.

Shear : Reinforced Concrete.

Section 169.—Reinforced concrete construction shall be designed so that the shearing stresses, both vertical and horizontal, developed in any part of the construction, shall not exceed the safe working strength of the concrete as fixed in this ordinance, or a sufficient amount of steel shall be introduced in such a position that the deficiency in the resistance to shear is overcome. This reinforcement to be part of, or rigidly connected to, the main horizontal tension bars.

When the safe limit of adhesion between the concrete and steel is exceeded, some provision shall be made for transmitting the strength of the steel to the concrete.

Columns.

Section 170.—Reinforced concrete may be used for columns when the ratio of length to least side or diameter does not exceed 15. The reinforcing rods shall be tied together at intervals of not more than the least side or diameter of the column, or spirally-wound steel may be used. No column shall be built less than 10ins. diameter.

When vertical reinforcement is used in columns, such as rods, they shall have full perfect bearings at each joint, and such joints shall occur only at floors or other points of lateral support and a tight-fitting sleeve shall be provided at all joints of vertical reinforcing rods.

The concrete shall cover the reinforcing bars at all points at least one and one-half inch, and in calculating the strength of a reinforced concrete column this outside 1in. of concrete shall not be counted as a part of the section of a column.

The axes of several columns acting continuously through two or more storeys shall accurately coincide, and the construction shall make special provision to effect this result.

Wind Pressure.

Section 171.—In the case of buildings in which allowance must be made for wind pressure, as provided in this ordinance, the reinforcing rods of columns shall be connected by threading the rods and by threaded sleeve nuts, or threaded turnbuckles, or methods equally effective and satisfactory to the Board of Public Works.

Tests — To be Made by Contractor on Demand.

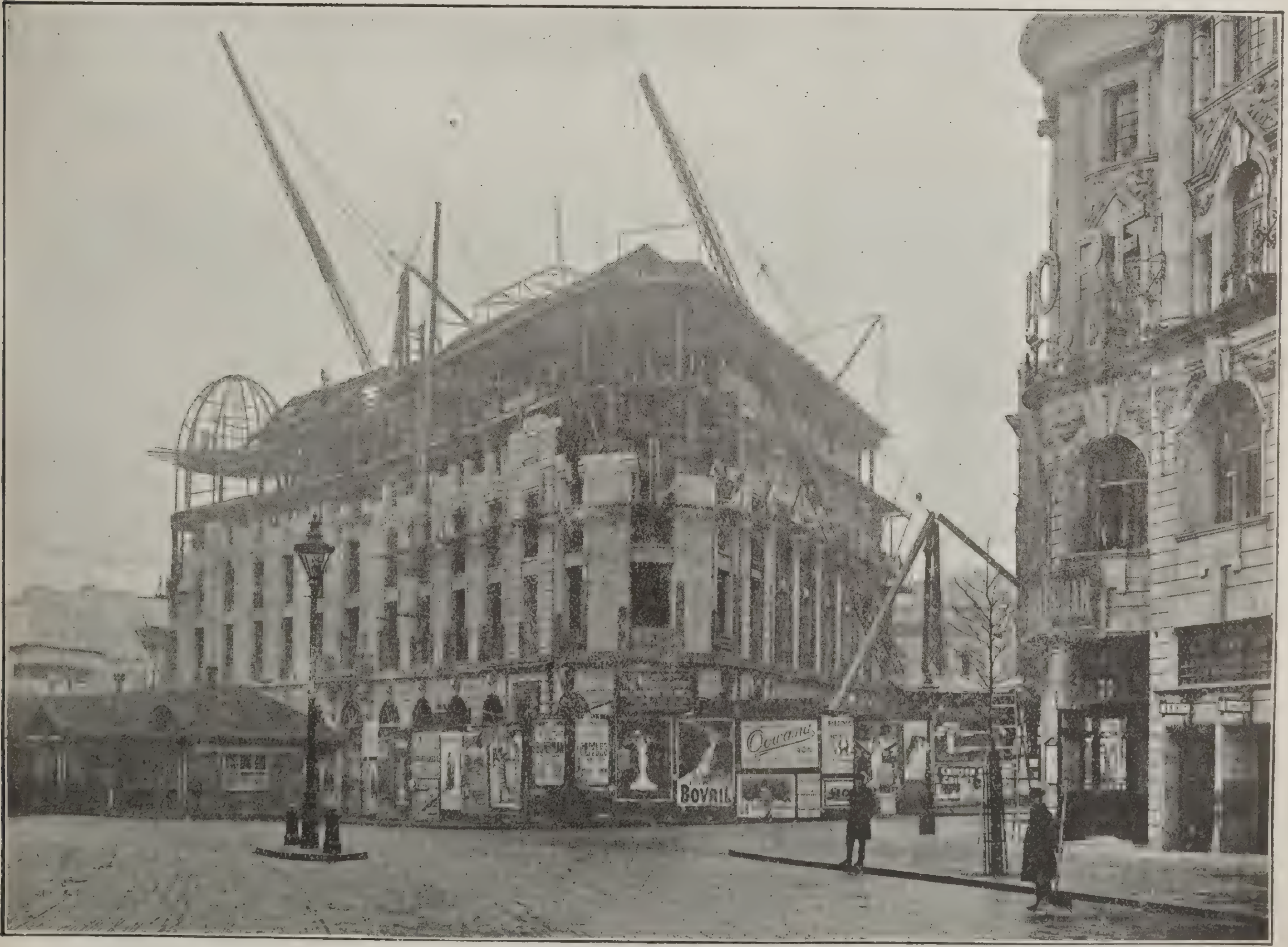
Section 172.—The contractor shall be prepared to make load tests on any portion of a reinforced concrete structure within a reasonable time after erection, as may be required by the Inspector of Buildings. Such tests shall show that the construction will sustain a load of twice that for which it is designed, without any sign of failure, or, in the case of beams, girders or floors, without deflecting more than one seven-hundredth of a span.

A Reinforced Concrete Floor Test.—Under this heading, on page 83 of the "Concrete and Steel Supplement" to our issue of November 7th, we published particulars of an interesting test recently made by Messrs. Potter & Co., Ltd., of 66 Victoria Street, S.W. We are now able to furnish some supplementary particulars. The materials used were ashes and clinker from boiler furnaces as received 5 parts, and Portland cement 1 part. The aggregate was carefully graded and the cement was of best quality. The reinforcement consisted of $\frac{1}{4}$ in. corrugated steel rods, distributed in a form supposed to give the best results. The chief object was to ascertain the resistance of the reinforcement to tensile and shearing strains. Ultimately the floor was loaded to about 3 cwts. per ft. super., when the upper portion commenced to crush. The centering was removed about three weeks after the concrete was deposited in place.

"MORNING POST" BUILDING.

The view below of the "Morning Post" building in course of erection at the corner of Aldwych and the Strand was taken on Friday last, November 30th. The steelwork is now practically all erected, and the Columbian reinforced concrete floors constructed, while the granite facing has now reached the fourth-floor level. This is the largest and finest example of granite work in London. The granite is particularly light in colour, and it has quite as good an appearance as Portland stone, while possessing much superior weathering qualities: the cost is about the same as for Portland stone, and any mouldings can be worked; indeed it is remarkable to see the vigorous decorative carving that has been done in the material on this building. The granite comes from Norway, and has been supplied by Messrs. A. and F. Manuelle, who also were responsible for the remarkably striking granite work at the Ritz Hotel.

A new building in Grosvenor Road, Pimlico, for the Associated Portland Cement Manufacturers, Ltd., has just been completed. The building was designed by Mr. H. O. Cresswell on the Hennebique system of ferro-concrete, and constructed by Messrs. Holloway Brothers, of Belvedere Road, S.E. Last Thursday a successful test was carried out on a floor, the clear span of the main supporting beam being 16ft. The maximum deflection with a load of 6cwts. per sq. foot was $\frac{1}{2121}$ of the span, or about $\frac{2}{7}$ of the proportion of $\frac{1}{600}$ specified by the architect.



THE "MORNING POST" BUILDING, ALDWYCH, LONDON: PRESENT CONDITION OF WORK. MEWES AND DAVIS, ARCHITECTS.

THE WALDORF HOTEL.

In the "Concrete and Steel Supplement" to our issue for November 7th we published views of the Waldorf Hotel in course of construction. This building is making rapid progress, and we shall publish further views of the steelwork in our next supplement. The total amount of the steelwork being put in the building is about 1,400 tons. The view below shows the construction of a typical floor. This is being executed in reinforced concrete, the form of reinforcement being indented bars of high elastic limit, supplied by the Patent Indented Steel Bar Co., Ltd. Our view shows the manner in which centering is supported from timber joists spanning between the girders, thus obviating the usual props from the floor below, which so interfere with and hamper building operations. The view shows the rods placed in position, each rod being bent at one end into the form of a hook so as to hold on the top flange of the joist, while the other end is left overlapping the next joist so as to reinforce the top of the concrete floor at the point of contraflexure. The rods of each floor slab alternate, so that a hooked end is followed by a long overlapping end. The hooked ends are the only parts which require to be bent hot. The cranking of the rods is done when placing them into position by just stamping them down. The workman is shown ramming the concrete. There is an elaborate plant for crushing and mixing the concrete, which we shall deal with more particularly at a later date. The subcontractors for the concrete work are Messrs. Watson Brothers, of Glasgow; they are represented by Mr. Boyd Wilson, who has been connected with fireproof-floor construction for a great many years, and whose name may be familiar to some of our readers in connection with the report of the big fire at Dundee, published in our issue for August 29th, in which we referred (with illustrations) to two floors at Watson's bond which resisted the fire, it being mentioned that these floors were designed by Mr. Wilson.

THE LITERATURE OF REINFORCED CONCRETE.

The published information on reinforced-concrete work has already reached such large proportions that it is impossible for us to devote space to a full record of its extent: so rapidly is it growing, indeed, that much difficulty is experienced in keeping cognisant of it all, quite apart from digesting it. The student and those practically engaged in reinforced-concrete work should at least know, however, the general bearings of the field, and be familiar with the chief sources of information. We propose, therefore, to give in this article a general survey of the field.

The earliest writings upon the use of iron for the reinforcement of concrete are doubtless the specifications of the early patentees, for particulars of which we refer the reader to our issue for June 20th last. These, however, can hardly be included among the literature of the subject.

So far as we are aware, the first real contribution was the book issued for private circulation in 1877 by Thaddeus Hyatt, an American inventor. This described numerous tests on beams and materials carried out for the author by Mr. David Kirkcaldy, and a fire test conducted by the author. The book also gives a method of calculation for beams, and is altogether a remarkable essay. Its importance was never appreciated by the contemporary public, and it practically had no effect upon the development of reinforced concrete.

The succeeding years were without material addition to the theory of the subject, which was dealt with in the most haphazard and unenlightened way by means of catalogues of the few firms engaged in the construction of fire-resisting floors with concrete strengthened by steel.

In 1887 M. Bordenave brought out his system of reinforcing pipes and sewers.

In 1888 M. Edmond Coignet, knowing the use his father, M. François Coignet, had made of iron rods to strengthen concrete, placed before the Société des Ingénieurs Civils of France his ideas as to the disposition of metal to resist tension and concrete to resist compression.

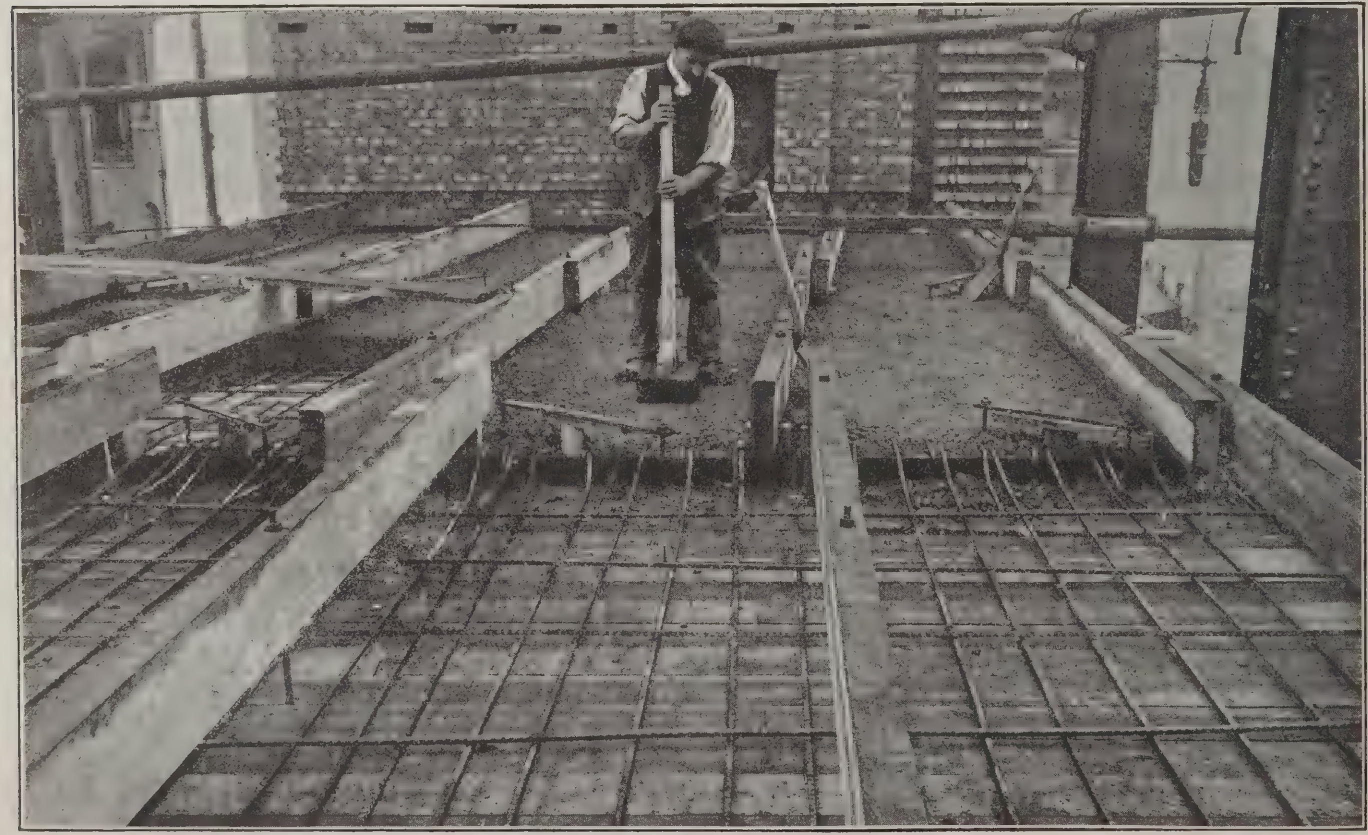
In 1889 M. Cottancin introduced his system, and M. Hennebique his in 1892.

The attention of engineers thus became attracted to the subject. M. Edmond Coignet and M. N. de Tedesco were the first to deduce rational methods of calculation for a combination of concrete and metal, and their paper, entitled "Du calcul des ouvrages en ciment avec ossature métallique," read before the Société des Ingénieurs Civils, and published in the Society's Bulletin for March, 1894, was the starting point of modern theory. This was the second real contribution to the subject.

Several engineers in the French government department of Ponts et Chausées, such as MM. Léon Stellat, L. Lefort, J. Resal and Harel de la Noë, investigated and discussed the matter in papers before societies between 1897 and 1899.

The first published contribution of M. Considère, Inspector-général des Ponts et Chaussées, giving the results of his careful laboratory experiments, which have done so much to establish theory, is to be found in the Comptes Rendus for September 18th, 1899.

Prof. J. Melan wrote on computations for concrete-iron construction in the "Oesterreichische Monatsschrift für den



REINFORCED CONCRETE FLOORS AT THE WALDORF HOTEL.

Oeffentlichen Baudienst," for December, 1896. Prof. J. B. Johnson contributed to the American "Engineering News" for October, 1897, an article on the calculation of the ultimate strength of concrete-steel beams. These two papers seem to be the start of a series of interesting contributions to theory in Austria and the United States respectively.

In 1896 Messrs. Fowler and Baker had tested a number of concrete slabs reinforced with expanded metal for the Expanded Metal Co., and further slabs were tested in 1899 by a sub-committee appointed by the Northern Architectural Association, the Newcastle, Gateshead and Tyne District Master-Builders' Association, and the Council of the Building Trades' Exchange. These tests were reported in our issues for December 6th and 20th, 1899.

In 1900 Mr. Philip Hobbs read a paper before the Northern Architectural Association, and on September 7th of the same year Mr. Arthur T. Walmisley, M.I.C.E., read a paper before the British Association, both of which papers dealt with the calculations for reinforced concrete. The latter referred to the experiments at Newcastle. A paper by Mr. James Bruce, discussing these same tests theoretically, and referring to reinforced concrete and a large warehouse then in course of erection on the Hennebique system in Newcastle, was read before the Northern Architectural Association on January 15th, 1902, and published in our issue for January 29th, 1902.

Early in the same year we published an illustrated article on "Armoured Concrete" by Mr. Andrew Johnston, M.I.C.E., M.I.M.E., in our annual publication "Specification," which dealt with the theory and practice of the subject.

Smaller contributions, such as articles, papers read, and reports on tests now become too numerous to detail. A good bibliography may be found in Taylor and Thompson's "Concrete, Plain and Reinforced."

In 1892 M. Paul Christophe, Ingénieur des Ponts et Chausées to the Belgian Government, published his admirable book "Béton Armé et ses Applications," and MM. C. Berger and V. Guillerme also published their "La Construction en Ciment Armé" in the same year. Mr. Charles F. Marsh was indebted to these two works, but chiefly to the former, for most of the material forming his book (the best and standard work in English), entitled "Reinforced Concrete," which was published in 1904 by Messrs. Archibald Constable & Co., Ltd. A revised and rewritten edition will be published in a week or two. M. Christophe's book also formed the basis of the first book on the subject (so far as we know) published in England, namely "Notes on Steel Concrete Construction," by Major J. Winn, R.E., published in 1903 by Messrs. W. & J. Mackay & Co., Ltd., at Chatham—an excellent little treatise.

In 1903 the results of M. Considère's investigations were collected from the reports and papers in French and translated into English by Leon S. Moisseiff, and published by Messrs. The McGraw Publishing Co., of New York, entitled "Experimental Researches on Reinforced Concrete." This book forms a valuable contribution.

If we continue for the moment to disregard foreign contributions and confine ourselves to English books, we must not ignore the contributions of specialist firms. In 1902 Mr. L. G. Mouchel, the agent for the Hennebique system in England, issued a large and important catalogue explanatory of this system and illustrating many executed works. This was reviewed at

In 1904 Mr. L. J. Mensch, representative

In 1892 Mr. L. J. Mensch, representative for the same system in Chicago, brought out his book called "Reinforced Concrete Construction," which was published by Mr. William Seafert, of Chicago. This also contains a good deal of useful information.

Contributions to both the theory and practice of the subject have appeared in successive editions of the catalogues of the Expanded Metal Co. in England and America, and other specialists in the latter country, such as Ransome, Thatcher, Kahn (of the Trussed Concrete Steel Co.) and Johnson (of the Expanded Metal and Corrugated Bar Co.).

The next general treatise to appear was "Reinforced Concrete Construction," by A. W. Buel and C. S. Hill, first issued in New York in 1904 and published in England by Messrs. Archibald Constable & Co., Ltd. This book is especially valuable for its digest of recent American contributions to theory and practice, especially as regards the latter, illustrations being given of about 200 reinforced concrete structures, with notes on their practical construction. The treatment of the theory and calculation of structures does not seem to us very enlightening, but to the practitioner it will be invaluable.

Prof. Wm. Cain's "Theory of Concrete Steel Arches and Vaulted Structures," published in New York in 1902, is a book for the specialist.

Mr. W. Noble Twelvetree's small book "Concrete Steel," published by Whitaker & Co. in 1905, was a fair summary of the fundamental principles of the subject, but the author's treatment was insufficient, even at that time, for much of the most recent information seemed to have been ignored by him.

Reinforced concrete is also dealt with at length in two excellent American treatises on the subject of concrete in general—namely, "A Treatise on Concrete Plain and Reinforced," by Frederick W. Taylor and Sanford E. Thompson, and "Cement and Concrete," by L. C. Sabin, published in 1904. The former book, by Messrs. Taylor and Thompson, is fairly thorough in its treatment of reinforced concrete, and as regards the general subject of concrete, contains an enormous amount of information that makes it invaluable; all students should possess the book, which is published by Messrs. John Wiley & Sons, of New York, and by Messrs. Chapman & Hall, Ltd., of London.

The most recent book also hails from America. This is "A Handbook on Reinforced Concrete," by F. D. Warren, published by Messrs. D. Van Nostrand Co., of New York, and Messrs. Crosby, Lockwood & Son, of London. It treats the subject in a very different way to other books. The first part of the book gives a general survey of the practical aspect of the subject; the second part records a series of tests carried out at the Massachusetts Institute of Technology, from which the author deduces constants and coefficients, which he adopts for preparing a series of tables given in Part III. from which he hopes the designer may obtain all necessary information to meet common cases in practice. The fourth part deals with the design of trussed roofs from a practical standpoint. We are not struck with the utility of the author's method, and as we disagree with some of his assumptions we cannot recommend the book to elementary students. It is, in our opinion, much better to refrain from endeavouring to standardise design yet, and better to give the various methods and data, so as to let the individual know where he stands. The book undoubtedly contains much valuable matter, but it should be in the hands of the experienced.

We may here step aside from our immediate subject to refer to two books that treat of subjects more or less allied. Concrete blocks are used very largely for building in the United States and are coming into use in England. The first book we have seen dealing with this important subject is "Concrete-Block Manufacture," by Harmon Howard Rice, a most instructive and excellently written work. It was published a few months ago by Messrs. John Wiley & Sons, of New York, and Messrs. Chapman & Hall, Ltd., of London, price 8s. 6d. nett.

Ordinary steelwork in modern buildings is so closely connected with reinforced concrete that the student and specialist require to make a study of it. There are many theoretical books on the subject, but scarcely any on the practical aspect, which is so important. Last year an excellent book, entitled "Constructional Steelwork," by A. W. Farnsworth, A.M.I.M.E., was published by Messrs. Charles Griffin & Co., Ltd., of London. This discusses in a most interesting manner the relation of theory to practice, the governing factor of economy, the duty of the designer, how drawings should be prepared, how to inspect and estimate for steelwork and practical shopwork.

Apart from books, a mass of information is available in periodicals, chief of which may be mentioned the "Engineering News" and the "Engineering Record," both United States weeklies. "Cement" and "Concrete" are also published in America.

On the Continent other important periodicals are "Beton und Eisen," "Zement und Beton," "Le Ciment," "Il Cemento," "Deutsche Bauzeitung," "Schweizerische Bauzeitung," and "Le Genie Civil."

As regards recent foreign books, we only find it necessary to add two to the list. In 1904 was published "Résistance des Matériaux appliquée au Béton et au Ciment Armé," written by M. N. de Tedesco, referred to above as responsible, with M. Coignet, for the first paper on rational calculations for reinforced concrete and M. A. Maurel, also another early investigator. The authors have had much experience in design and practical construction, and the book is of foremost importance as a contribution to theory. It critically reviews resarches and experiences, and puts forth much original matter.

The other work is of the nature of a "pocket-book," with a few pages of a diary in front for use as a desk companion. It is called "Beton-Kalender, 1906, taschenbuch für den Beton und Eisenbeton bau sowie verwaudte Fächer" and has been compiled by the staff of "Beton und Eisen." It contains a great amount of most valuable information as regards both theory and practice, with many illustrations. It is published by Messrs. Wilhelm Ernst & Sohn, of Berlin, at the remarkably low price of 3 marks (3s.).

NEW STREET STATION ROOF.

The collapse of a portion of the roof of Charing Cross Station, about a year ago, caused questions to be raised respecting the security of the roof over the original portion of New Street Station, Birmingham. During the present year a complete overhauling has been in progress. The roof is practically 53 years old. With a length of 1,080ft. it has a single girder span of 212ft., at a height of 75ft. from the rails. It was for a long time the largest single-span roof in the world. The girder consists of an elliptical double T of wrought-iron, which gives the roof its outline. Beneath this is a thick tie rod, also arched, and connected with the upper portion by twelve upright trusses of lattice work, the intervals between each upright being crossed by tension straps.

The examination which has recently been carried out shows that the roof has worn remarkably well, and is still perfectly secure. A good deal, however, has been learned during the last half-century, and, in order to provide an ample margin of security, as well as to add to the ultimate life of the roof, it has been deemed desirable to incur an expenditure of several thousand pounds in its reinforcement. For some months work has been going on in connection with the reconstruction of the wind screen at the south end of the station. This somewhat difficult undertaking is well advanced. To counteract any tendency to spreading in connection with the roof girders a supplementary tie bar is being applied to each, or a double strap of steel extending from foot to foot of the girder at a distance of about five feet below the original tie-bar, and braced up into a slightly arched form by rods depending from the main arch upon each side of the upright trusses.

The use of pneumatic tools enables this work to be done with a celerity which would not have been possible a few years ago. Up above an opening of the roof near the supporting columns in the private road of the station there has been constructed a platform upon which is placed the engine working the compression apparatus, and elastic tubes are carried along the scaffolding to the spot at which the riveting of the lengths of steel is carried on. Two of the reinforced girders are now fully exposed to view opposite to the Queen's Hotel portion of the station. It is seen that the effect will be to make the roof work look a little more complicated and a little lower than at present, but the operation of and the reason for the device is obvious. The work will take about six months to complete.

REINFORCED CONCRETE SYSTEMS.

VIII.—Broad-Flange Beams.

The ordinary fire-resisting floors constructed with small joists with narrow flanges between girders formed of larger joists of the ordinary standard section constitute a time-honoured method of construction. Recently, however, with the placing of broad flange beams upon the market as an ordinary commodity, a change has come o'er the scene, and we realise that the old construction can be improved in a good many radical ways without altering its entire principle.

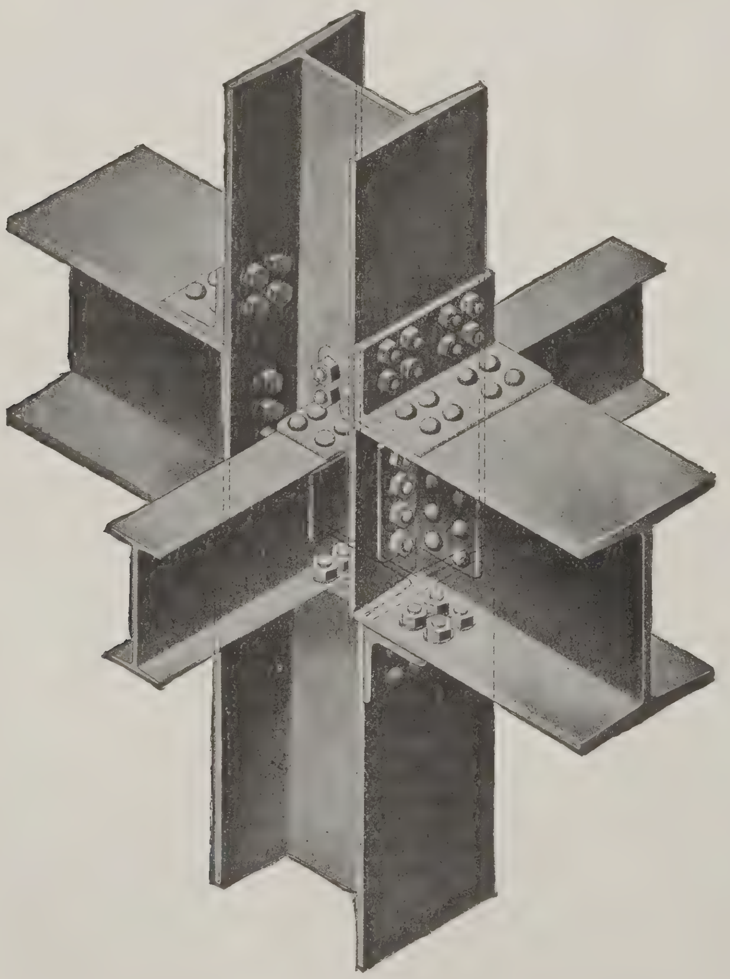


FIG. 7.—TYPICAL CONNECTIONS WITH BROAD FLANGE BEAMS

The standard section came into being for no theoretical reason: its narrow flanges were derived from considerations of practical necessity. The old-fashioned rolling-mill rolls sections of more than ordinary flange width with difficulty, because, as is evident, the deepest parts of the rolls which form the web have a much greater periphery than the periphery of the deepest part of the cut for the flanges.

The rolling mill

consists, as doubtless many readers are aware, of an upper and lower set of rolls, placed with their axes horizontal. The ingots are converted into blooms by first rolling them in what is known as a "blooming" or "cogging" mill. The flanges are formed by squeezing the metal into grooves in the rolls. The blooms are gradually reduced by being passed backwards and forwards through the rolls, until eventually they go through the "finishing pass" in the rolls and the joist is produced. Obviously if the flanges go too deep into the rolls they will travel at much slower speed on the smaller periphery than the web does on the larger periphery, and they will be torn, or the metal will become unsound.

Mr. Henry Grey, an Englishman who emigrated to the United States and eventually became manager of the Homestead Works of the well-known Carnegie Steel Co., invented a new form of mill known as the Grey Mill, which overcomes the difficulty of producing sections with deep flanges. In the Grey mill the bloom is first passed between an upper and lower roll of small size, whose sides are chamfered off. These rolls squeeze the material out at the sides to the approximate size of joist, and the "finishing pass" only rolls the flanges, which are truly squared. The rough section is then passed between another "stand" of rolls consisting of two horizontal chamfered rolls and two other rolls placed with their axes vertical. The horizontal rolls work upon the web, while the vertical ones roll the flanges. These latter take their motion from the material passing between and travel at a different rate to the main rolls. Consequently the flanges are rolled equally with the web, and the metal in very wide flanges is equally sound.

The Grey mill has enabled sections of rolled steel joists to be designed with more regard to theoretical economy. The broad flange beams have only 9 per cent. taper on the flanges as compared with the 14 per cent. taper on ordinary joists. The edges of the flanges are rolled square instead of being rounded off. Indeed, by suitable modifications of the mill, rolled steel joists can be produced without any taper on the flanges, with practically square corners throughout, and with thinner webs than it is possible to produce in the ordinary mill. Perhaps most important of all, the Grey mill rolls the section all over; pressure is exerted on both sides of the flanges and also upon their edges, so that the metal is thoroughly sound in every part of the section.

Broad Flanges Economical.

Broad flange beams, compared with the ordinary joists, show considerable economy in many ways. Take the case of two beams of approximately equal size and of equal carrying capacity, one with broad and the other with narrow flanges; if the section modulus is divided by the weight per foot it will be found that the

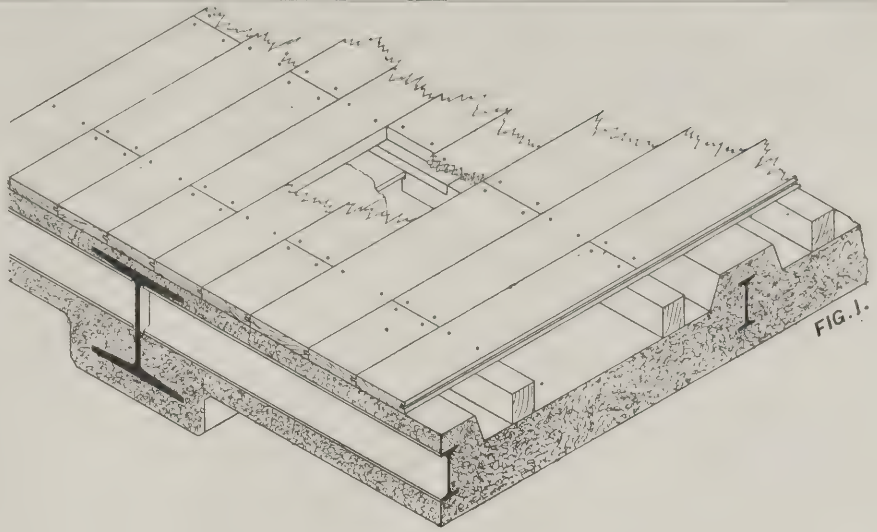


FIG. 1.

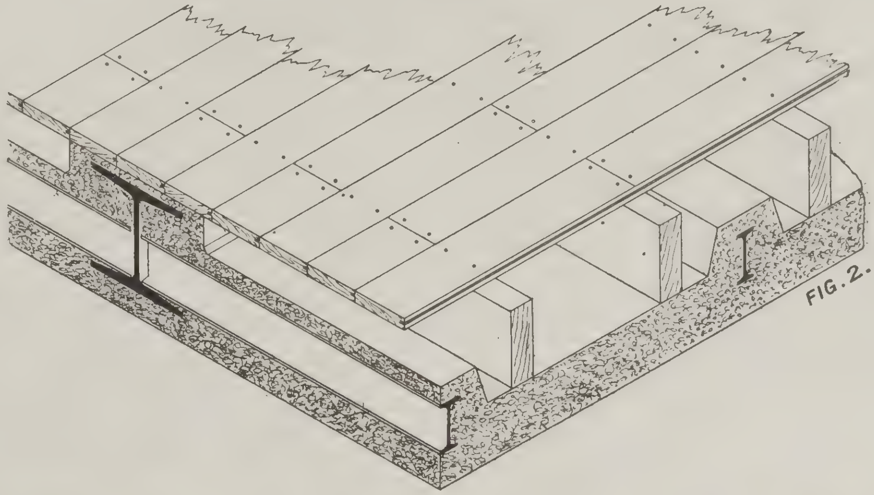


FIG. 2.

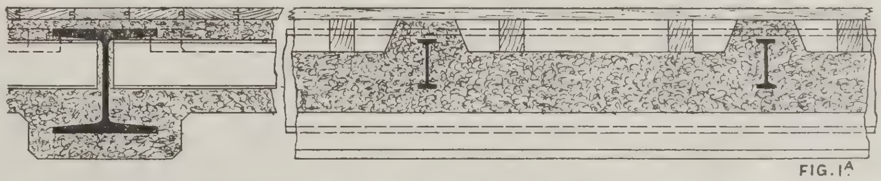


FIG. 1A

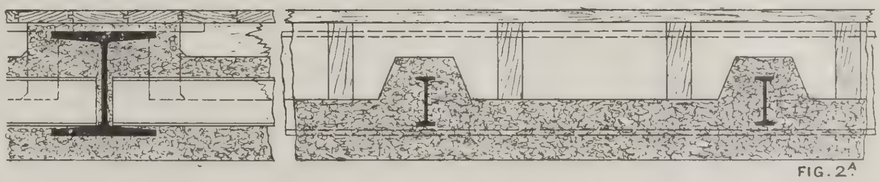


FIG. 2A

broad flange shows a bigger ratio of carrying power to weight than the narrow flanged beam. The economic value thus obtained shows that the broad flange beams on an average are estimated to show a saving in weight of 15½ per cent. and an average gain of nearly 5 per cent. over narrow-flanged sections. When we compare the larger sections of broad flange beams with ordinary compound or riveted girders, the saving is still greater for it is obvious that the cost of producing riveted girders is necessarily much greater than that of rolled steel beams, because the amount of workmanship required is so much more. And the above estimate does not take account of the considerable saving effected in the practical advantages which the broad flange beam offers in the way of economising workmanship in connections. The narrow flange beam permits of practically only one rivet hole in the width of the flange at the side of the web, and this, too, of small diameter. Usually ¾-in. rivets are adopted; with the broad flange beams ⅞-in. rivets can be used; thus, three rivets in the case of broad flange beams will do the work of four rivets in the case of narrow flange beams. Two rows can be put side by side in the flanges of large sections of broad flange beams. When the broad flanged sections are used for both beams and stanchions the possibility of using double rows of rivets allows the connections to be much simplified, as shown, for instance, in Fig. 7. If this illustration is compared with a connection between ordinary beams and stanchions doing equal work this simplicity will be very evident. Where the loads with ordinary sections require a compound girder, the simplicity of the connections with the broad-flange beams becomes more striking. The interior flanges of compound double web girders are practically inaccessible, and, consequently, it is customary to secure the upper flanges by a couple of bolts only. Thus there is no adequate provision for lateral stability with such compound girders. Fig. 7 shows how, in the case of broad flange beams, lateral stability is adequately secured. It will be seen from this view that the web cleats are riveted to the web by a double row of rivets in order to obtain a good hold on the web.

Used for Stanchions.

As regards the use of broad-flange beams for stanchions, these possess advantages over the ordinary built up stanchions composed of plates, joists, channels, and Z bars, firstly, in reducing labour in construction, erection and design; secondly, in being easily accessible for painting and less liable to rust than built sections; and, thirdly, in giving greater stability owing to the greater strength of the connections when broad-flange girders are employed in conjunction. The superiority of the square-shaped broad-flange section over the narrow-flanged joists for use as a stanchion is obvious. Weight for weight, the carrying-power of broad-flange beams used as stanchions is stated to be usually about twice as great as that of ordinary joists of the same depth.

We see, thus, that broad-flange beams offer many advantages in steel frame construction, and, consequently, they will no doubt come into much greater use in modern buildings in the next few years. We may, therefore, profitably consider the relation they bear to the problems of fire-resisting floor construction in reinforced concrete. Figs. 1, 2, 3, 4, 5 and 6 show various methods of constructing concrete floors reinforced with ordinary small rolled steel joists. The wide flanges of the broad-flange beams provide ample accommodation for the housing of steel joists, while the lateral resistance of wide-flanged sections makes them particularly suitable for arched concrete floors, the inside width of the flanges also providing an excellent abutment for the arches.

For flat concrete floors, broad-flange beams offer a much larger surface for the adhesion of the concrete than narrow-flange beams; indeed, quite 25 per cent. Consequently, the steel joists do not cut up the concrete and destroy the continuity of the construction as they ordinarily do. The chief advantages, however, which the broad-flange beams offer are, reduction in depth of the main beams, and the end-fixing of the block of concrete between the flanges. As regards this latter point, it is evident that the wide and shallow block of concrete confined between the broad flanges is of great value as regards the end-fixing of the slab. When the ends of light joists reinforcement to the slab are embedded in concrete it is estimated that they have a carrying-power approaching that of fixed ends, which increases their normal carrying-power by 50 per cent. Consequently, the amount of metal required in a floor is very greatly reduced as regards the subsidiary joists, apart from the main beams.

Forms of Concrete Flooring.

It will be seen from Figs. 1, 1a, 2, 2a, 3 and 3a that the forms of flooring suggested by Messrs. H. J. Skelton & Co., who are the pioneers in regard to the use of broad-flange beams in this country, show a great saving in material and labour. The subsidiary joists need no connection to the main beams by riveted cleats, because the block of concrete confined between the wide flanges of the main beams securely holds them in position. In each case the thickness of the concrete under the steel joists, as shown, is 2in., in accordance with the generally accepted custom, and the concrete floor, as shown, is 5in., as required by some building regulations.

In Figs. 1 and 1a the main beams project below the ceiling. This is avoided in Figs. 2, 2a, 3 and 3a, the difference between the last two types of floor being that the wooden joists supporting the floor boards run in opposite directions. Fig. 2 has the advantage of reducing the depth of these wooden joists required in Fig. 3.

In Fig. 4 broad-flange beams of shallow depth are shown spaced closely so as to avoid the use of reinforcing metal. In the example illustrated, the beams are of 7-in. by 7-in. and 16-ft. span, the beams being spaced 3ft. 9in. centres. The floor is designed to carry a load of 2½cwts. Fig. 5 is a modification of Fig. 4, with the difference that the wooden joists bridge from beam to beam and relieve the concrete ceiling of any load except its own weight, so that it may be made thinner and regarded only as a fire-resisting screen.

Fire Resistance.

Fig. 6 is a detail taken from an actual floor of the type illustrated in Fig. 1. It will be observed that the ends of the joists are supported on ordinary bricks for convenience of erection. The bricks are plumbed level by means of wedges made of pieces of slate, &c. This view also shows the manner in which the bottom flanges should be protected by a sheet of expanded metal in order to prevent any concrete flaking off in a fire, which it is liable to do by reason of the slight deflection that takes place at high temperatures. If the bottom flange of an ordinary joist becomes bared in this way, the floor is almost certain to be entirely destroyed; but it is a remarkable fact that the first fire test on a floor constructed with broad-flanged beams carried out by the British Fire-prevention Committee showed that the broad-flange beams, although greatly deflected, still remained in position, due, no doubt, to the concrete held between the wide flanges.

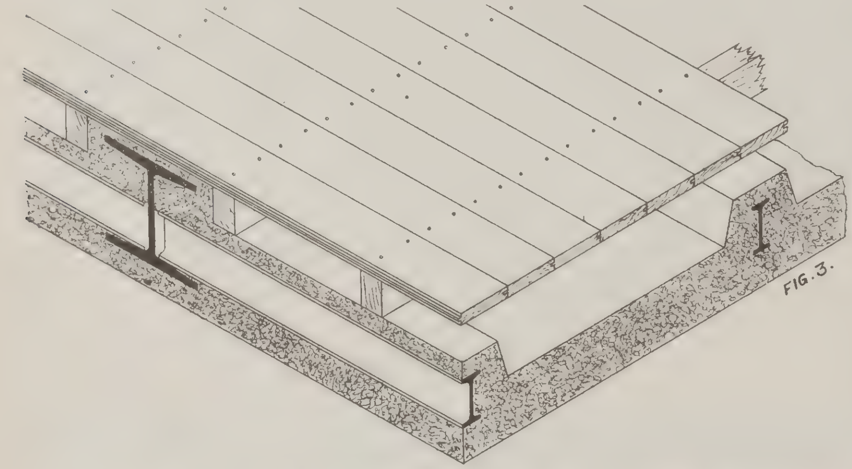


FIG. 3.

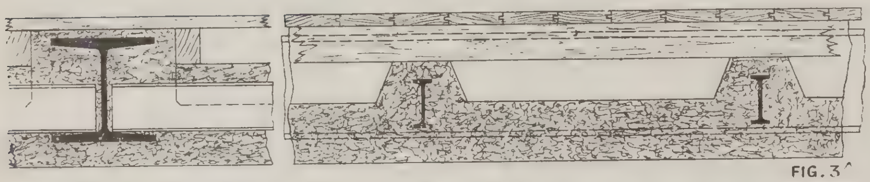


FIG. 3a

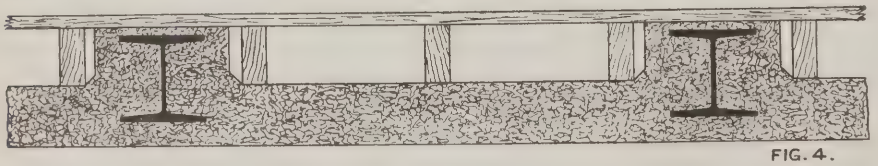


FIG. 4.

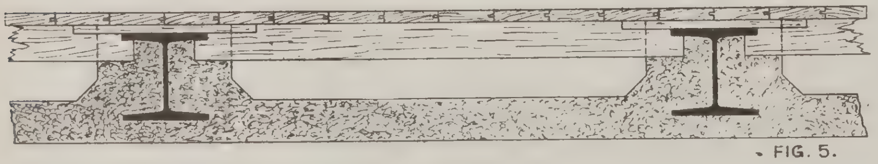
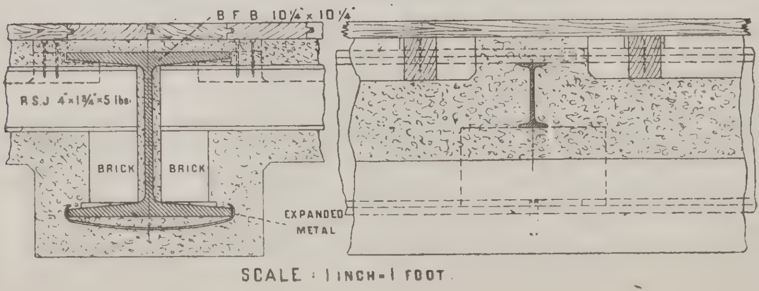


FIG. 5.

FIG. 6



SCALE : 1 INCH = 1 FOOT.

Briefly, the principal advantages of such a type of floor are simplicity and cheapness, the economy consisting in the saving of about 10 per cent. in the weight of main girders and of about 30 per cent. in the weight of intermediate joists, owing to the end-fixing above referred to, and finally by the saving of labour in the riveting of angles to the webs of the main beams. In addition there are the advantages of no skilled labour being required in erection, no time being lost in fitting and building up, and considerable head-room being saved.

Practical Advantages.

Although concrete floors reinforced with small joists, looked at from the point of view of modern reinforced concrete theory, shows a waste of metal, this is counteracted by the fact that the metal sections of which they are built are of the commonest description and that floors can be easily calculated. The heavy expenses incurred by the proprietors of patented systems are thus claimed to be avoided, while the cost of centering (such a large item in reinforced concrete work) is reduced by the builder being able to support the centering from the joists, and remove it speedily, thus facilitating building operations.

We referred above to a report upon two fire tests which were carried out by the British Fire Prevention Committee. The first floor was executed with Thames ballast concrete, which is notoriously inefficient from a fire-resisting point of view. Consequently, this fire test was a failure, although it sufficed to show the considerable resistance which the broad-flange beam has over the ordinary joist. The second test, however, in which clinker concrete was used and the soffit of the beams protected by a sheet of expanded metal arranged as shown in Fig. 6, was an absolute success, the maximum deflection being only .35in. after four hours (and this was not permanent, being entirely recovered when the floor had cooled). We refer our readers to our report on this test in our issue of May 9 for further details.

New Factors in Design.

Architects and designers of steelwork should study the broad-flange beam closely in connection with any work they have in hand, because, as we have endeavoured to convey above, it has changed the factors governing design. Logically used, the broad-flange beam undoubtedly offers very great advantages in many circumstances, and now that it has become an ordinary commodity and is likely to be still more largely manufactured in the near future, it will produce a radical change in steel-frame construction.

Messrs. H. J. Skelton & Co., of 71, Finsbury Pavement, London, E.C., the well-known steel merchants and manufacturers, are primarliy responsible for bringing the broad-flange beam prominently before the profession, and they publish some valuable information regarding these broad-flange beams which should be carefully kept for reference.

In specifying broad-flange beams care should be taken to state that they must be rolled by the Grey mill, the only type of mill which can efficiently produce them, because although others may have approximately the same section, the flanges cannot have the same strength or soundness of metal as the web when rolled by the ordinary mill.

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The Government adopts Reinforced Concrete.

The fact deserves to be widely made known that the new General Post Office building to be erected on the site of Christ's Hospital, Newgate Street, is to be constructed of reinforced concrete. The magnitude of this building and the fact that it is a Government one, will bring the use of reinforced concrete into greater prominence than it has ever attained before in this country, while this action of the Office of Works sets an official seal upon the utility and reliability of this method of constructing buildings which must convince the authorities who have the regulation of building by-laws throughout the country, and who have so hampered the progress of reinforced concrete with their out-of-date by-laws. We hear that it is proposed to adopt reinforced concrete for the construction of other Post-office buildings, while the Admiralty has already employed it and has arranged for the erection of other structures. It certainly looks as though the various specialists in this form of construction were going to experience a great boom in the immediate future, more especially as the building trade is recovering from the depression of the last few years, and next year promises to see a great revival. We were foremost in realising the importance of paying special attention to reinforced concrete construction, adding a special monthly "Concrete and Steel Supplement" to our other features. Our enterprise, we are glad to know, has been widely appreciated by the architectural profession and building trades. The extension of the General Post Office will cover an area of nearly 2½ acres and provide accommodation to the extent of 11½ acres of floor surface. The building has been designed by Sir Henry Tanner, principal architect to H.M. Office of Works, on the Hennebique reinforced concrete system.

Restoration at Holyrood.

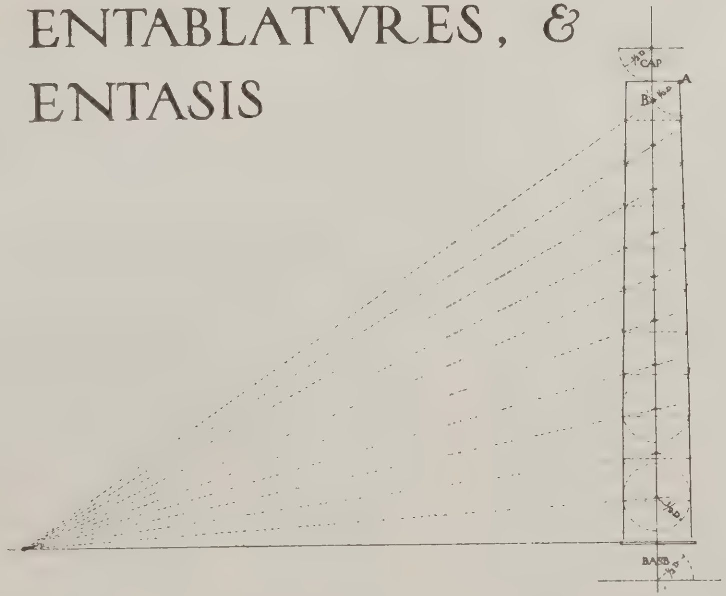
The late Lord Leven left a direction in his will for the restoration of the Chapel Royal at Holyrood, with the proviso that Lord Balcarres and Sir John Stirling-Maxwell should accept responsibility for carrying out the work. Professor W. R. Lethaby was instructed to make a very careful report, and as his report is not favourable to the proposal, it has been intimated to His Majesty's Office of Works and to Lord Leven's executors that the restoration cannot be proceeded with. The ruin, it may be mentioned, is the nave of the original church, most of the existing work being of a very beautful type of early thirteenth-century architecture: indeed, Professor Lethaby speaks of the west door as being "the noblest thirteenth-century doorway in Great Britain," after the splendid south doorway at Lincoln Cathedral. The walls and arches which remain are much decayed and disintegrated, capitals being shapeless masses and mouldings and details all perished. Professor Lethaby considers it would be impossible to restore the ruin for use as a modern chapel without the ancient architecture almost completely disappearing in the process, and he earnestly recommends that no scheme of rebuilding or addition should be entered upon. As Professor Lethaby says, the problem of making a modern building out of an ancient ruin is beset with difficulties which cannot satisfactorily be solved, because there is not sufficient evidence for restoring features which have been lost, and there is nothing interesting or commendable in conjectural restoration of such work. This must always be so: hence we think the best thing is not to attempt any such restorations. We know they were attempted in the last century, but it is earnestly to be hoped that there will not be any repetition of such unfortunate energy. What is wanted is to look after the old work before it has fallen into a complete state of ruin. The common policy, however, seems to be to let the stonework perish into formless masses, and then to start a full-blown scheme for clearing away the old work and putting up a modern copy, which is always hopeless.

The Filthy Condition of Waterloo Bridge.

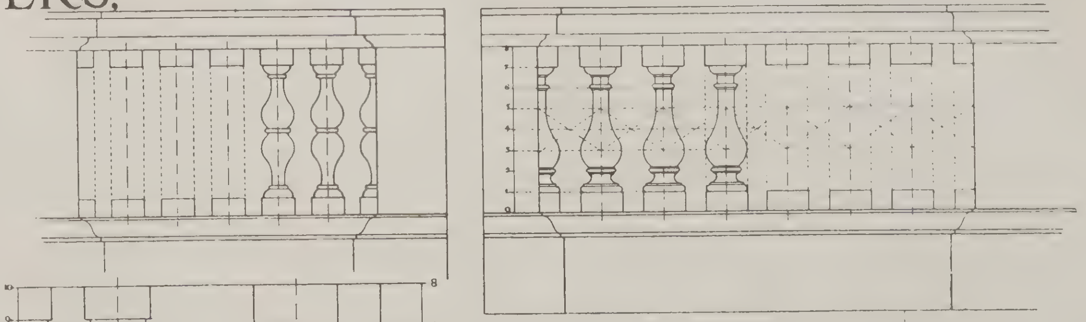
In his presidential address to the Institute this year, Mr. Collcutt reiterated the suggestion for covered bridges across the Thames. The suggestion is an excellent one, we think, but we fear it is not likely to be carried out just yet. In the meantime, however, the London County Council might make an attempt to keep one of the most exposed of the Thames bridges—Waterloo Bridge—in something like a clean state. At this time of the year especially the matter calls for attention. The roadway gets into a disgraceful condition in wet weather, and the thousands of pedestrians who have to cross the bridge every day are plastered with filthy mud from the crowd of vehicles. Now and again there is a vision of a few boys with squeegees, but their efforts are very diminutive. And things are not much better when the weather gets fine again, for the refuse on the roadway now blows into one's face, and it is frankly ludicrous to see one man with one hand water-truck (that might very well have come out of a museum) covering the pavement with a series of trickles. The condition in which this bridge is kept is a disgrace to the County Council.

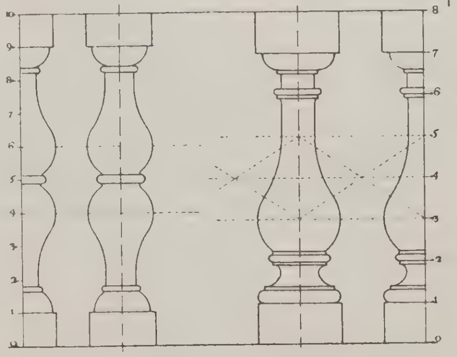
PLATE 12.

BLOCK CORNICES, BALUSTERS, ENTABLATURES, & ENTASIS

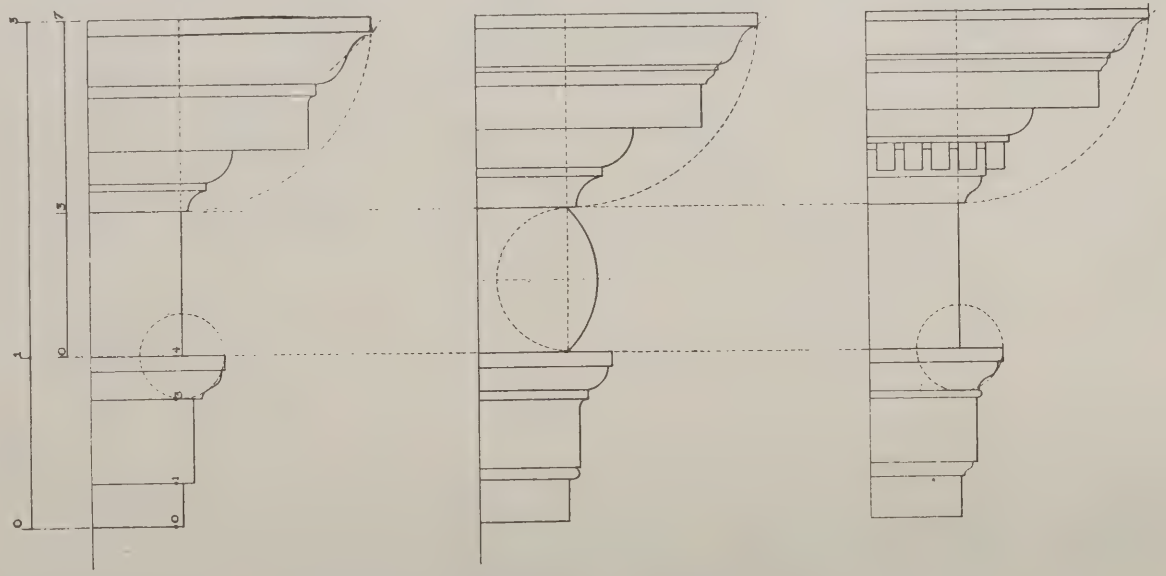


METHOD OF SETTING OUT ENTASIS

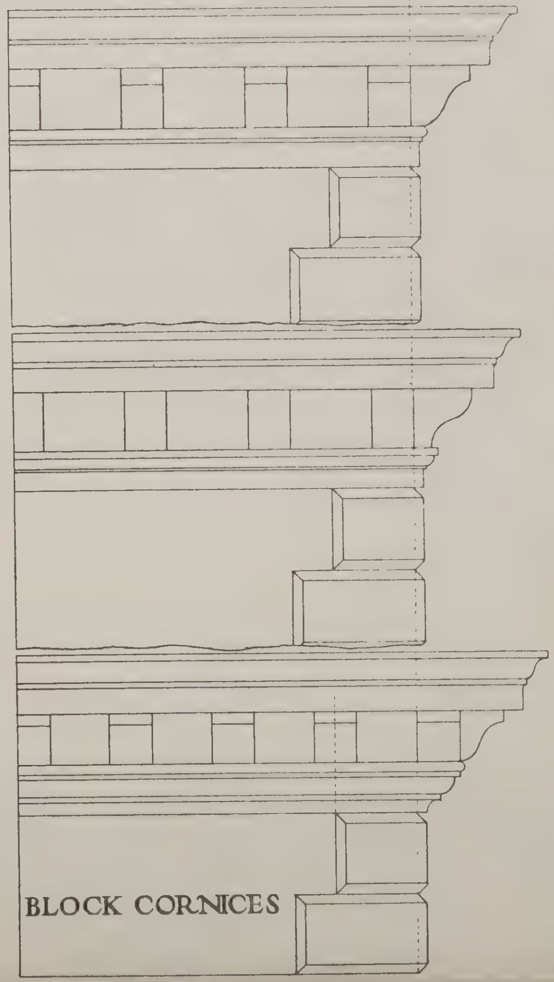




BALUSTERS.



DOOR & WINDOW CORNICES



BLOCK CORNICES

THE ORDERS AND THEIR APPLICATION. BY ALFRED W. S. CROSS, M.A., F.R.I.B.A., AND ALAN E. MUNBY, M.A.

PRACTICAL NOTES FOR ARCHITECTURAL DRAUGHTSMEN

By Alfred W. S. Cross, M.A., F.R.I.B.A., and Alan E. Munby, M.A.

THE ORDERS AND THEIR APPLICATION.

(Concluded from p. 244, No. 615.)

Plate XI.

Niches.

The general treatment of niches resembles so closely that of doors and windows that but few further remarks are requisite. The height of a niche opening should never exceed 2½ times its width, nor be less than twice its width, unless designed for a bust or ornament of similar form, when, if the ornament have no pedestal, it may be a little more than square. The opening is generally carried to the bottom of the surrounding treatment, though the examples, given by Gibbs, show an equal margin all round the aperture. Whether a margin be included at the base or not, it is always provided at the sides and head of the niche.

On plan niches are generally semi-circular, and the head, which may be plain or treated with a shell ornament, is therefore, quadrispherical. The depth of the niche must be sufficient to contain the whole of any statuary placed within it.

If impost mouldings mark the springing of the niche arch they should not be continued round the aperture internally if any use is to be made of it, as complete internal repose is essential for the background of any contained composition.

Plate XII.

Entablatures for Doors and Windows.

The three entablatures shown on this plate will be seen to conform, broadly speaking, with those previously given. The friezes, however, are somewhat narrower, and the architraves rather wider than those shown with the Orders. These examples are suitable for door and window dressings, more particularly for internal work. The architraves as shown are one-third the total height; of the remainder, three-sevenths are given to the frieze and four-sevenths to the cornice. The projection of the architrave is increased to one-quarter its height.

Pulvinated friezes may be effectively used with these entablatures. To set out the pulvination the frieze is bisected vertically on a line in the plane of the lowest face of the architrave. A semi-circle is drawn internally with this point as centre and half the width of the frieze as radius, and the point at which a horizontal line bisecting the frieze cuts this semi-circle is the centre from which the curve of the frieze is to be struck from its extremities on the vertical face line previously drawn.

The dimensions of the entablature may be taken from the rule previously given for the height of the architrave, which should not exceed one-sixth the width of the opening thus crowned.

Palladio makes his friezes equal in height to the architrave if flat, but only three-fourths of the height if pulvinated, while the cornice in either case is about five-fourths of the height of the architrave.

Block Cornices.

A building is often finished with a cornice when no Orders are used in its composition. Such cornices, known as block cornices, differ in some measure from those used with the Orders. The ordinary forms are usually adopted as far as the base of the corona, but the modillion blocks below are often equal in height to the whole of the members above, while the members terminating the cornice below partake more of the nature of an architrave than ordinary bed moulds. The height of the cornice is greater than its projection, a ratio of 3 to 2 for these dimensions forming a suitable proportion.

Quoin stones when used should be about half the height of the cornice, and their lengths may be alternately as 2 to 3, the shorter stones being somewhat longer than they are high. In all cases of quoins and rustic work questions of bonding will generally decide the exact height to be adopted.

The height of a block cornice should be proportional to the height of the building. An average of ten examples quoted by Gwilt gives this height as one-fifteenth the height of the building, but when subsidiary cornices are used between storeys this height may be reduced. In dealing with Plate VI. the rule given by Gibbs—namely, that the height of the cornice should be one-eighteenth of the height of the storey crowned—has already been cited.

Another modification of an entablature —in which the frieze is omitted—known as an architrave cornice, was often used by the old masters. This is generally to be found over arched work in which the height of a full entablature would have been excessive.

Balusters.

Of the many forms of balusters used in compositions two have been selected for illustration. There are but few forms which commend themselves when drawn to a large scale, but taken together in execution the effect is generally superior to that obtained on a drawing. Those with the single swelling are more suitable for heavy compositions, whilst the double-bellied example, which may be varied in detail, is well adapted for short lengths of lighter work. Chambers, from whose "Civil Architecture" many of the rules previously given have been culled, points out that the height of a balustrade for use should be between 3ft. and 3ft. 6ins., but so far as treatment is concerned the height should be between two-thirds and four-fifths of the height of the supporting entablature, this proportion including only as much of the balustrade as can be seen by the ordinary observer. In the case of single-bellied balusters he divides the whole height of the balustrade into 13 parts, giving 3 to the plinth and base, 8 to the balusters, and 2 to the rail. In the case of balustrades of a lighter character he divides the whole height into 9 parts, giving 3 to the base, 4 to the baluster, and 2 to the rail. The examples illustrated show the adoption by Gibbs of not greatly dissimilar proportions.

The space between the balusters is equal to half their width, and a half baluster is placed against pedestal breaks or other terminations. The number of balusters between breaks in a balustrade will often be fixed by the treatment below, but 8 or 9 whole balusters are said to produce the most effective result. The width of the pedestal die should equal the upper diameter of the column below, but where columns do not occur in the composition the die may be about square, and in long ranges the principal breaks may project and be flanked by half dies on either side, having, of course, similar cap and base treatments continued round them. The method of proportioning the baluter itself and its setting-out are fully indicated on the plate.

Balusters should not be used on pediments, but when on the rake of steps the base and rail follow the rake, while the balusters maintain their vertical treatment, producing wedge-shaped terminations against the base and rail.

If statues are placed on a crowning balustrade their height should not exceed one-quarter the height of the column and entablature below them, and vases should be about two-thirds this height.

Entasis.

Several methods for setting out the entasis of columns are given by different authorities. As previously stated, the entasis may start one-third up the column, below which height the column is a true cylinder. Since, however, it is difficult to work a column so that this starting point is not apparent, it is better when setting out the entasis to a large scale to start from the bottom of the shaft. In the method shown on the plate, the centre line of the column and its top and bottom diameter having been fixed, the length of half the lower diameter is drawn downwards from the face of the column at the top in such a direction as to touch the centre line. This line (A B in the figure) is continued downwards until it cuts a horizontal line drawn from the base of the shaft. Any number of rays from this point of intersection are then drawn to cut the centre line and the semi-diameter placed along such lines, with one end upon the centre line, will at its other end cut the surface of the column on the entasis curve. Hence a line drawn through the points so obtained will give the outline required. The entasis of the other side of the column is obviously obtained by drawing horizontal lines through the points previously obtained and marking off spaces equidistant thereto from the centre line.

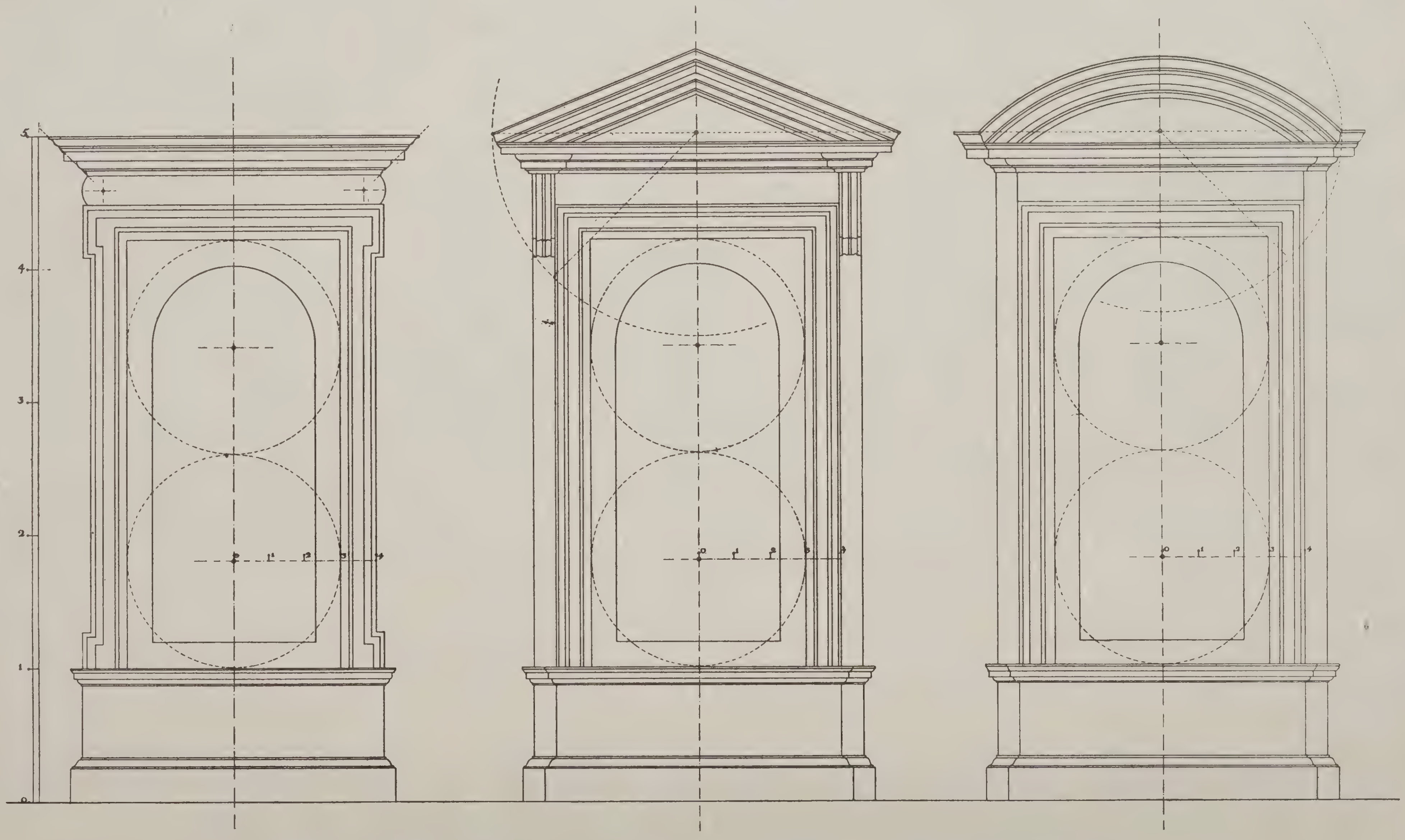
The publication of Plates XI. and XII. in this issue completes the first portion of this series, dealing with the Orders and their application. The following is a list of the subjects dealt with, with dates of the issues in which the matter and illustrations appeared :—

Plate I.—The four Orders. (*Sept. 19th.*)
,, II.—The Tuscan and Doric Orders in detail. (*October 3rd.*)
,, III.—The Ionic and Corinthian Orders in detail. (*October 3rd.*)
,, IV.—Examples of Arcading. (*October 24th.*)
,, V.—Details of Imposts and Arch Mouldings. (*October 24th.*)
,, VI.—Order upon Order, and Intercolumniation. (*November 7th.*)
,, VII.—Doorways and Pediments. (*November 21st.*)
,, VIII.—Windows with Entablatures. (*November 21st.*)
,, IX.—Windows, rusticated treatment. (*November 21st.*)
,, X.—Venetian and other Windows. (*November 21st.*)
,, XI.—Niches and their treatment. (*December 12th.*)
,, XII.—Block Cornices, Balusters, Entablatures and Entasis. (*December 12th.*)

The second portion of this interesting series will be commenced next month. Perspective, shadows, and various other matters will be dealt with.

NICHES & THEIR TREATMENT

PLATE JJ.



THE ORDERS AND THEIR APPLICATION. BY ALFRED W. S. CROSS, M.A., F.R.I.B.A., AND ALAN E. MUNBY, M.A.

Correspondence.

Bending Moments on Continuous Girder.

To the Editor of The Builders' Journal.

Sir,—Prof. Adams's reply on p. 228 of your issue for November 7th regarding the bending moments and reactions of a continuous girder gives only rough approximations, which, in some instances are seriously in error.

The table below gives the actual bending moments, calculated by the "theorem of three moments," and the reactions determined from the bending moments and the loading. Four cases are given—namely (1) all spans loaded; (2) outer spans only loaded; (3) centre span only loaded; and (4) centre span and one outer span loaded.

In each case the loading has been taken at 1 ton per lineal ft. The letters A, B, C, D represent the points of support proceeding from left to right.

	Supports.	A	B	C	D	Remarks,
I.	Bending Moments ...	Nil	32·87	32·87	Nil	All spans loaded.
	Reactions	5·95	20·05	20·05	5·95	
II.	Bending Moments ...	Nil	11·13	11·13	Nil	Outer spans loaded.
	Reactions	7·31	8·69	8·69	7·31	Centre span unloaded.
III.	Bending Moments ...	Nil	21·74	21·74	Nil	Outer spans unloaded.
	Reactions	— 1·36	11·36	11·36	— 1·36	Centre span loaded.
IV.	Bending Moments ...	Nil	17·46	37·15	Nil	Spans B., C. and C., D, loaded.
	Reactions	— 1·09	10·105	21·305	5·68	A., B. unloaded.

The bending moments are given in ft.-tons, and the reactions in tons. The weight of the girder has been neglected.

It will be observed that in case III. the outer reactions are negative. Consequently, in this case the outer spans will have no bending moment, unless they are held down; if they are not held down the centre span will have to be treated as a beam simply supported at its ends, and in these circumstances the bending moments at supports B and C vanish and the reactions at these supports become each 10 tons, instead of 11.36 tons.

Referring to case IV., it will be seen that the reaction of the outer support next the unloaded span is negative. For a similar reason to case III. there will be no bending moment in the unloaded span, unless the support with the negative reaction is held down; if this support be not held down, then the bending moment at support B vanishes and the spans BC and CD will have to be dealt with as continuous girders having two spans only.—Yours truly,

DE SILVA.

To the Editor of The Builders' Journal.

Sir,—The results given in the reply,[*] referred to above, were obtained from Humber's "Handy Book of Strains," which has been a standard work for the last forty years. They were only given as approximate, and "de Silva's" results may be more accurate, but it would have been interesting to see his graphic diagrams for the four cases with the requisite formulæ.—Yours truly,

HENRY ADAMS.

London.

"A Municipal College of Arts."

To the Editor of The Builders Journal.

Sir,—The statement in your issue for last week that Mr. MacGillivray, R.S.A., is the person responsible for the idea of forming a municipal college is entirely erroneous. The movement was initiated by Sir Rowand Anderson, when the School of Applied Art was founded about 15 years ago, for the teaching of architecture and the allied arts, and by bringing students of all the arts in contact with one another, a far greater insight and broader outlook would therefore follow. This school was modelled on the lines of the Ecole des Beaux Arts, Paris, the main idea being to break away from the South Kensington *régime.* It was carried on under the Board of Manufacturers for Scotland, and later received the patronage of the Edinburgh Town Council.

The idea to form one large municipal school of Fine and Decorative Arts is the outcome of a combined movement of many persons connected with art in Edinburgh. A committee was formed to bring the matter before the municipal authorities, who undertook to give effect to the desire. Mr. MacGillivray was suggested by one of the councillors as an artist who might be asked to give his opinion as to the most suitable plan to adopt and as to the method of working the school.

That Mr. MacGillivray should receive the entire credit is unfair to all the other persons who have been instrumental in bringing about this much-desired institution.—Yours truly,

J. Myrtle Smith.

[The statement referred to was based on particulars given in the Scottish Press, which we took to be correct.—*Ed.* B. J.]

Notes and News

The Bournemouth Undercliff Drive has been approved by the Board of Trade, and a tender for the work, amounting to nearly £17,000, has been provisionally accepted.

New Baths at Handsworth have been erected at the corner of Hinstock Road and Grove Lane at a cost of about £22,000 (inclusive of site).

Gloucestershire Architectural Association.—A general meeting of this Association (which was formed recently) was held two weeks ago at Gloucester, the chair being occupied by Mr. F. W. Waller. It was decided to forward a note of condolence to the relatives of the late Mr. H. A. Prothero. The minutes of the founders' meeting were then read and confirmed, and draft rules of the Association were considered, amended, and formally adopted by the Association. Officers for the ensuing year were then elected as follows:—President, Mr. F. W. Waller, F.R.I.B.A.; vice-presidents, Mr. M. H. Medland, F.R.I.B.A., and Mr. H. W. Chatters, F.R.I.B.A.; council, Mr. W. B. Wood, A.R.I.B.A., Mr. J. Villar, F.S.I., and Mr. H. A. Dancey, M.S.A.; hon. corresponding secretaries, Mr. F. Fletcher Trew, M.S.A., Gloucester, and Mr. G. P. Milnes, A.M.I.C.E., Stroud; general secretary, Mr. T. Overbury, M.S.A., Lloyd's Bank Chambers, Cheltenham.

The Betterment of Liverpool in respect of its streets and buildings is the aim of a society which has just been formed at the instigation of the Liverpool Architectural Society.

At St. Stephen's Vicarage, Southwark, a much-needed parsonage has been completed. Mr. John W. Rhodes, of Mitre Court Chambers, Temple, E.C., was the architect, and Messrs. Spiers & Son, of St. John's Wood, N.W., were the builders.

A New Church and Institute of the Missions to Seamen has been erected at Tilbury Docks, from designs by Messrs. James & Laycock, of 4, Bloomsbury Place, W.C. The contractors were Messrs. Patman & Fotheringham.

New Premises for Messrs. Novello & Co., the well-known firm of music publishers, have just been completed in Wardour Street from designs by Mr. F. L. Pearson, F.R.I.B.A. The building is in Renaissance style, carried out in red brick and stone, and includes a hall 44ft. by 36ft. by 24ft. high, which takes the place of the old shop. This hall is panelled out in oak, with carved embellishments.

St. Mark's Campanile.— In his report to the Syndic of Venice, Prof. Luxardo recommends that the new Campanile of St. Mark, as built, shall be cut down to the base of the foundations, and a fresh start made. This drastic course is urged as a result of a careful analysis of the materials used, it having been found that the bricks and cement are both very defective.

New Buildings in Glasgow. — The photograph of the entrance doorway to the Edinburgh Life Building, Glasgow, on page 253 of our issue for November 28th, should have been attributed to Messrs. T. and R. Annan & Sons, not to Messrs. Bedford Lemere & Co. The clerk of works for this building, and also for the other new buildings in Glasgow by Mr. John A. Campbell, was Mr. John Bowman.

ENGLISH AND FRENCH ARCHITECTURE.

Mr. W. H. Bidlake gave a lecture on this subject before the Birmingham Architectural Association on November 30th. He pointed out that Englishmen and Frenchmen had carried out their antagonism so far as to dispute each other's claim as to the origin of Gothic architecture; but in these days of the *entente cordiale* we were willing to make mutual concessions. While the French allowed that the high vaults like those of Durham and the English Decorated style were the precursor of the French Flamboyant, we, on our part, allowed the great French cathedrals to be the most perfect expression of Gothic art. Proceeding to make a comparison between the French and English cathedrals, Mr. Bidlake pointed out the much greater loftiness of the former and the consequence it entailed, as, for instance, the system of flying buttresses to resist the thrust of the vaults, and the suppression of the central tower. Whilst great external magnificence was thus attained, the English had as compensation a grander external effect in the triple towers of such cathedrals as Lincoln and Durham, and the crowning steeple of Salisbury. Owing to the lower elevation of the English vault, bringing it more within range of the eye, the English architect was induced to elaborate the groining; and from this had resulted the magnificent vaults of Exeter and King's College Chapel. Mr. Bidlake then compared the simple square ending of the English choir with its large window with the complex system of radiating chapels of the typical French choir; and concluded by a series of illustrations of the west fronts of the great French cathedrals with their marked triple portals. He allowed that while we in England had no triple doors to compare with France we had at least in Peterborough a façade which might console us for their absence.

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[*] It will be observed that the 2 in the denominator of last fraction, line 3 below the diagrams, has dropped out.

Views and Reviews.

A Mechanical Engineer's Pocket Book.

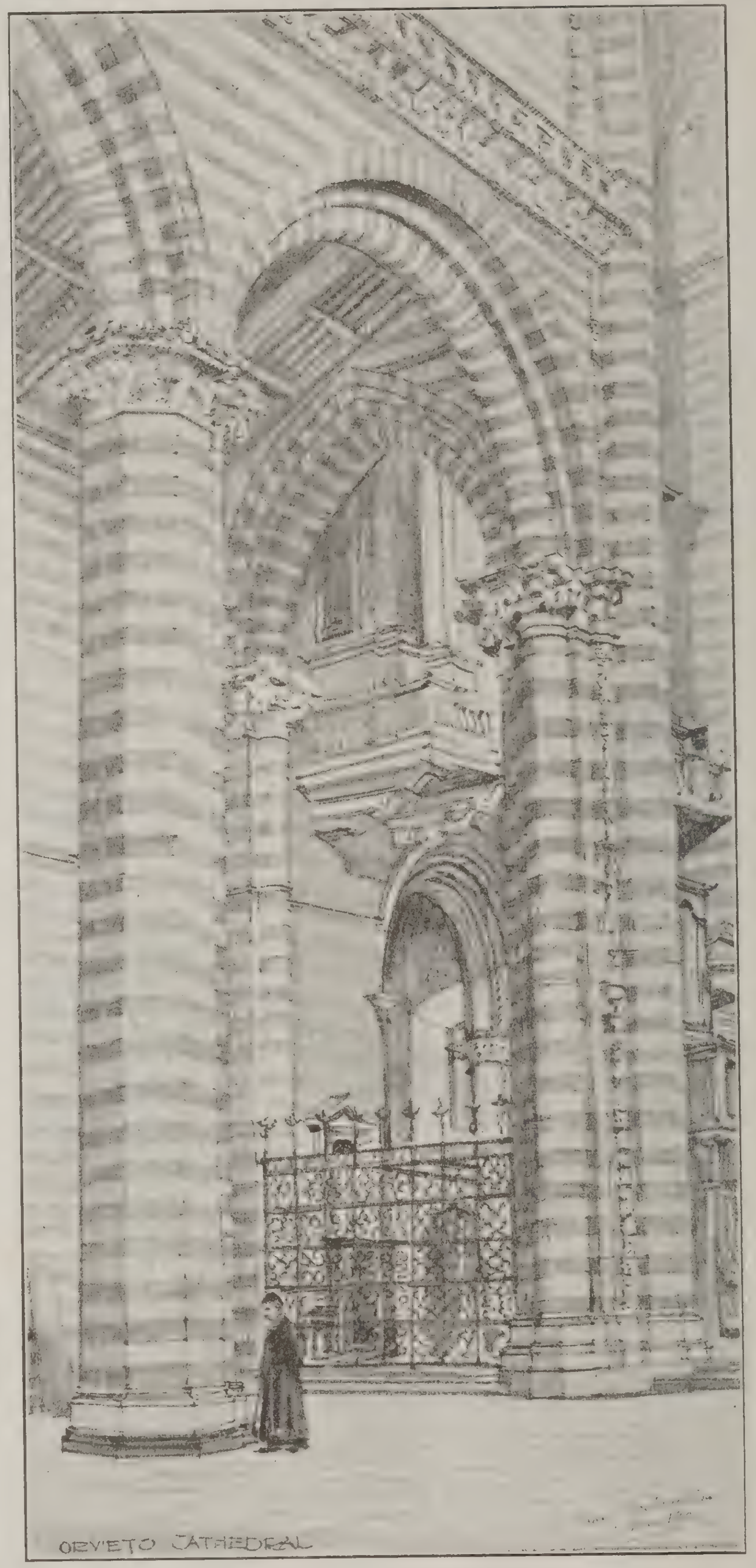
The edition of this excellent pocket diary and year-book for 1907 contains all the good features of the former editions, while it has been improved in numerous directions. It has undergone a thorough revision, having been entirely re-set in new type. Some of the less important matter in previous editions has been condensed, and sections on subjects which call for fuller treatment have been enlarged. Among the new features which have been introduced we may mention a lengthy section on gas engines, which embodies a concise account of the design, construction and working of this type of internal combustion motor. A new section is also devoted to oil engines, while the growing importance of the subject has led to the introduction of a section on suction gas producers. Still another new section gives data and particulars of the construction of reverberatory furnaces, and there are other additions too numerous to mention. The book is a marvel of cheapness, and everyone in any way connected with mechanical engineering should get a copy every year.

The "Mechanical World" Pocket Diary and Year-Book for 1907. London and Manchester: Emmott & Company, Ltd., price 6d. nett.

Cheap Housing.

This book, which has been published by the Co-partnership Tenants' Housing Council, deals with the subject of garden villages. The Co-partnership Tenants' system is now being pushed, but it by no means offers such an ideal solution of all the problems in the regeneration of the working classes as its advocates would lead us to believe. It is true the tenant purchases a house in one way, but he never possesses the actual building as his own. He only purchases shares to the value of his house. The system, in fact, is an advanced socialistic one, and as such it is not generally approved. Of course, when schemes for the erection of villages are administered on the co-operative principle, we cannot expect a high standard of taste to prevail, and, consequently, the examples shown in this book of the houses which have been erected by the Ealing Tenants, Ltd., in that suburb of London, are not even innocuous: they are distinctly bad in design. Moreover, the illustrations shown of the work of the Ealing Guild of Handicraft, run in connection with this co-operative society, however praiseworthy they may seem to the zealous advocates of the system, unfortunately seem to us little removed from the worst period of taste in the Victorian era. It is a weary process waiting for the public to improve or help themselves, and we must think that greater progress would be made by the encouragement of individual enterprise, which would serve to educate more quickly the rank and file of the public. In this book there is an article by the architect responsible for the co-partnership housing scheme at Letchworth, Mr. Raymond Unwin, and there are numerous illustrations of his dispersed about the book. These designs are picturesque, but the picturesqueness is obtained at some cost, as well as sacrifice of space. The book, however, is in many ways most interesting and instructive and deserves to be widely read.

"Garden Suburbs, Villages, and Homes; all about Co-partnership Houses." London: Co-partnership Tenants' Housing Council, 22, Red Lion Square, W.C., price 6d. nett.



DRAWN BY ALAN. G. MACNAUGHTAN.

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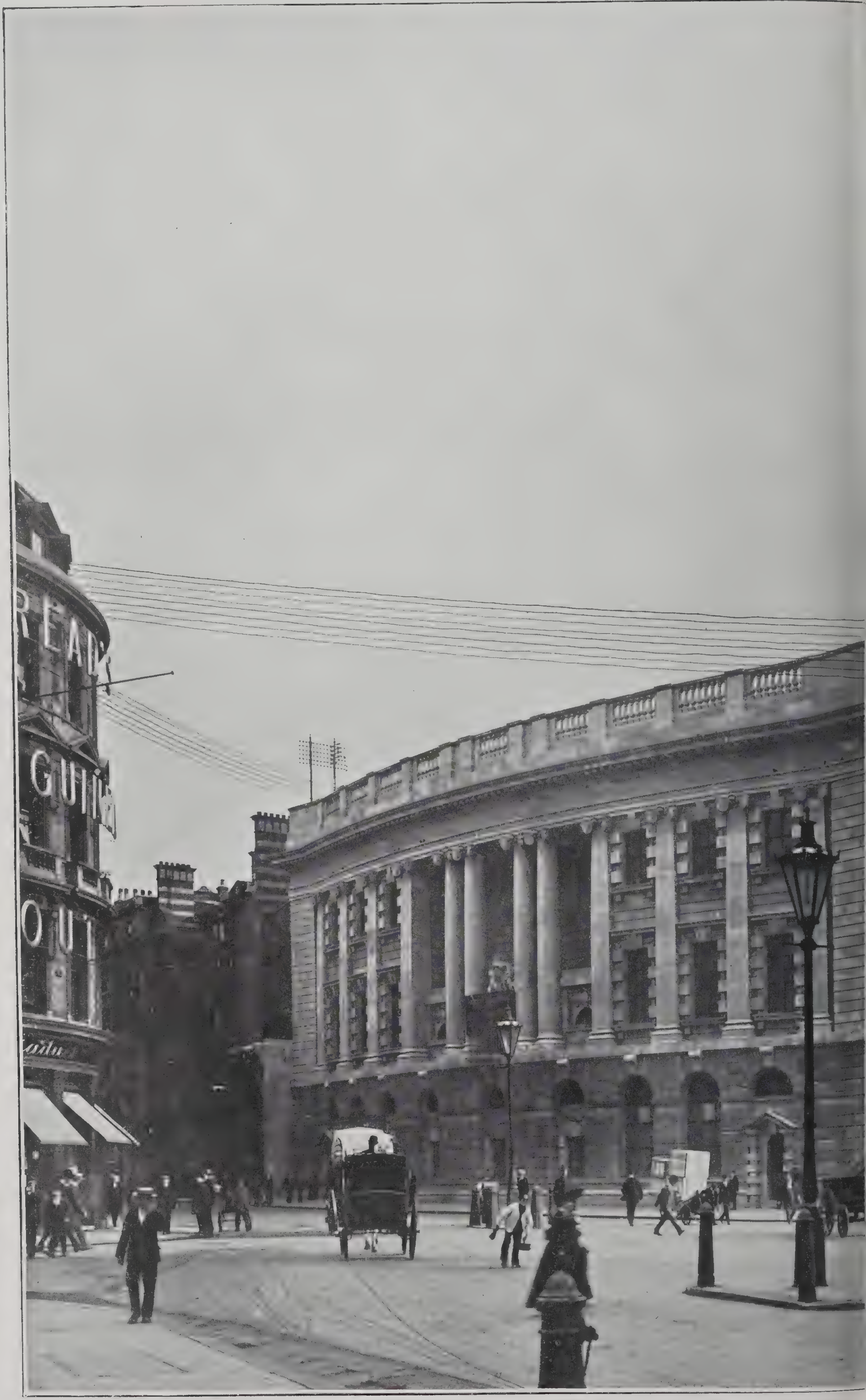
Supplement to
The Builders' Journal and Architectural Engineer,
Wednesday, December 12th, 1906.



THE NEW CENTRAL CRIMINAL COURT, OLD BAIL

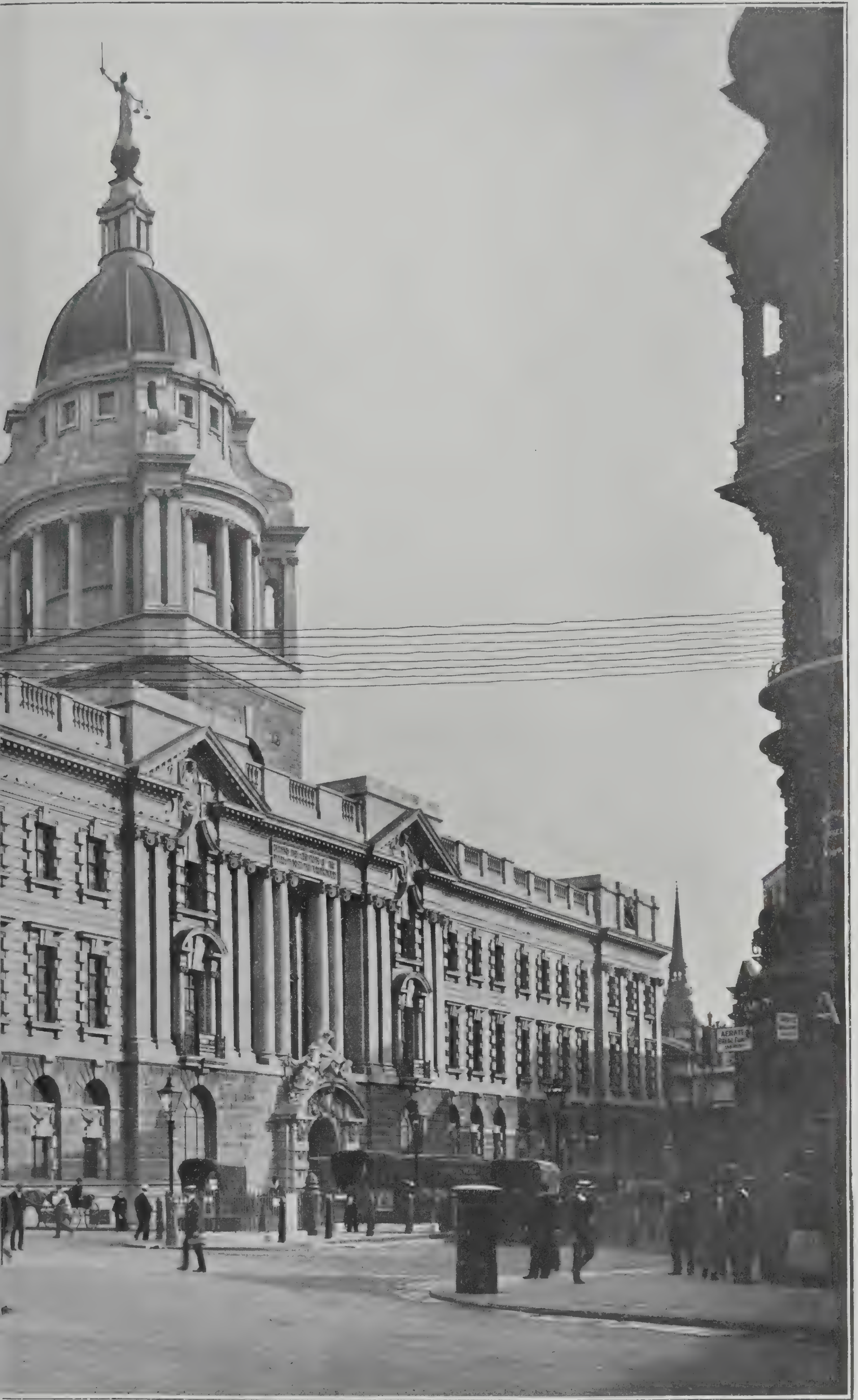


Photo: Bedford Lemere & Co

ON. E. W. MOUNTFORD, F.R.I.B.A., ARCHITECT.

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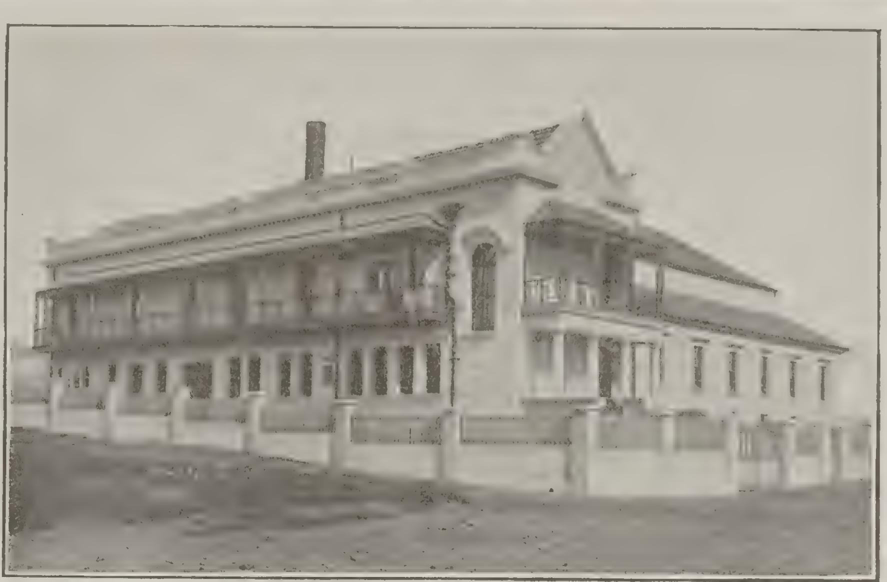
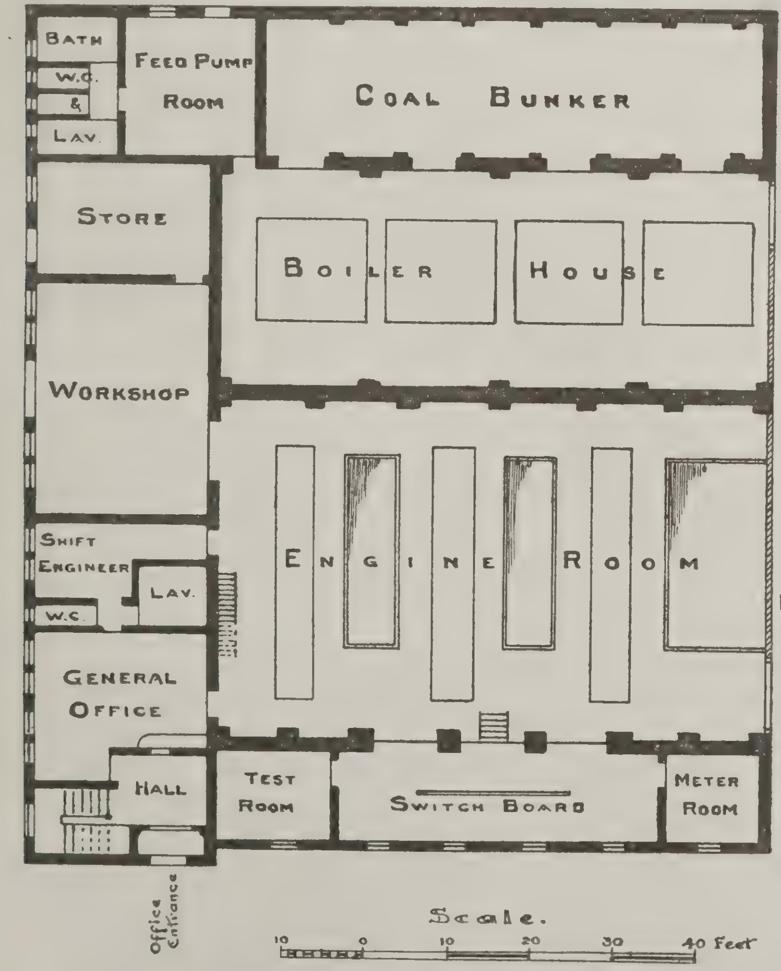
PORT ELIZABETH POWER STATION



ELECTRICITY GENERATING STATION, PORT ELIZABETH.
A. S. BUTTERWORTH, A.M.I.C.E., TOWN ENGINEER.

The accompanying photograph shows the new power station which has been completed this year at Port Elizabeth, South Africa. The general arrangement of the ground floor is shown by the plan. The upper floor of the office block contains the chief and assistant engineers' offices, and living-rooms for a portion of the staff. To the latter is due the comparatively rare feature of the balcony, which gives a somewhat unusual appearance to a "works" centre; the fact of the offices and living-rooms occupying such a prominent position has affected the general treatment and architectural character of the buildings to a considerable extent. Behind the main block is an accumulator house constructed of wood and iron, 60ft. by 26ft. Both engine-room and boiler-house are 66ft. long, 41ft. and 26ft. 6ins. in width, and 25ft. 6ins. and 27ft. in height respectively. The two are entirely disconnected, so that no coal dust can reach the machinery in the engine-room. These and the coal bunker can be extended indefinitely as required, the temporary end being so constructed that the existing portion will not be interfered with in the slightest degree. The railway siding is brought over the coal bunker to facilitate the emptying of the trucks. The walls of the engine-room and adjoining switchboard room are lined with white glazed bricks to heights of 9ft. and 5ft. respectively, relieved by coloured bands, skirting and moulded capping. At the level of the capping is the springing of the arches from the piers which carry the travelling crane girder. The floors of these rooms are paved with teak blocks of herring-bone pattern, a considerable portion overhanging the condenser pits, which are 8ft. deep. The doors in this part of the building are of oak, but the whole of the woodwork in the entrance hall is of teak, the floor being tiled. Although corrugated iron is the roofing material employed to cover the engine-room, boiler-house and coal bunker, the remaining portion of the main block is roofed with Bridgewater tiles (18ins. by 14ins.) which, together with the light stone-coloured tint with which the cement work is finished, gives a bright, pleasing appearance to the exterior, in keeping with the surroundings, which are not begrimed by the never-ceasing smoke that pollutes the atmosphere of so many English towns and cities.

The buildings have been designed and carried out under the supervision of the town engineer, Mr. A. S. Butterworth, A.M.I.C.E.; Mr. E. Grubb, as architectural assistant to the municipality, having had the actual superintendence of the works whilst in progress. The contractors were Messrs. Wills and Davey. The total cost has been about £11,000, inclusive of such external work as the formation of the railway embankment, siding, etc. Provision has been made for three 400 k.w. sets of turbo-generators and four marine-type tubular boilers with the attendant condensing plant, feed pumps, &c. The electrical portion of the undertaking has been carried out under the direction of the resident electrical engineer, Mr. R. Pape, A.M.I.E.E. The total outlay will amount to about £85,000.



PLAN OF PORT ELIZABETH ELECTRICITY GENERATING STATION.

Enquiries Answered.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional, or legal matters.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Rolled Joist Questions at Examinations.

NEWPORT, MON.—STUDENT writes: "On page 91 of your issue of February 14th last, under the heading of "Distribution of Load on Girder," Professor Adams obtains the size of the joist by reference to maker's list. How should this question be worked out in the examination room?"

Examination questions involving the finding of the section of a rolled joist are always troublesome, partly because resistance to the bending moment is not assumed to be taken by the flanges alone, as in built-up girders, and partly because the standard dimensions cannot well be committed to memory. Approximate sections may be arrived at as follows:—Say the loading is such as to give a maximum bending moment (M) of 15 ton-ft.

on a span (L) of 10ft. A suitable depth of joist would be $d=\frac{L}{2}\times\frac{M}{L}=\frac{1}{2}M=\frac{1}{2}\times15=7{\cdot}5$in., say 8ins. for even measurement. Then $a=\frac{M}{{\cdot}78d}=\frac{15}{{\cdot}78\times8}=2{\cdot}4$ sq. in. area of flange. If the breadth of flange is six times the thickness divide the area by 6 and take square root for thickness, $\sqrt{\frac{2{\cdot}4}{6}}=\sqrt{{\cdot}4}={\cdot}633$, and width $={\cdot}633\times6=3{\cdot}798$, or guessing at the nearest stock size, say, 4ins. by $\frac{5}{8}$in. The weight in lbs. per foot run is about 12 times the area of flange in square inches, $2{\cdot}4\times12=28{\cdot}8$, say 29lbs. As $M=\frac{WL}{8}$, the bending moment of 15 ton-feet on a span of 10ft. would be given by a distributed load of $W=\frac{8M}{L}=\frac{8\times15}{10}=12$ tons. Turning to a catalogue the nearest section is 8in. by 4in. by 25lbs., and the safe load on a span of 10ft. is given as 13, 9, or 7 tons, according to the factor of safety. See "Designing Ironwork," 2nd Series, Part 4 (Spon, 2s). In the case referred to on p. 91, February 14, 1906, with a maximum bending moment of 18·75 ton-feet, $d=\frac{1}{2}M=\frac{18{\cdot}75}{2}=9{\cdot}375$, say 10in., $a=\frac{M}{{\cdot}78d}=\frac{18{\cdot}75}{{\cdot}78\times10}=2{\cdot}4$sq. in. This being the same area of flange as above the size of flange required will be about 4ins. by $\frac{5}{8}$in., and the whole weight in lbs. per foot run, say, 29lbs., making the proposed section 10ins. by 4ins. by 29lbs., while the British Standard section is 10in. by 5in. by 30lbs.

HENRY ADAMS.

Payment to Assistant during Examination.

LIVERPOOL.—A SUBSCRIBER writes: "Is it usual in the profession for an employer to continue to pay an assistant during a week's absence for purpose of examination?"

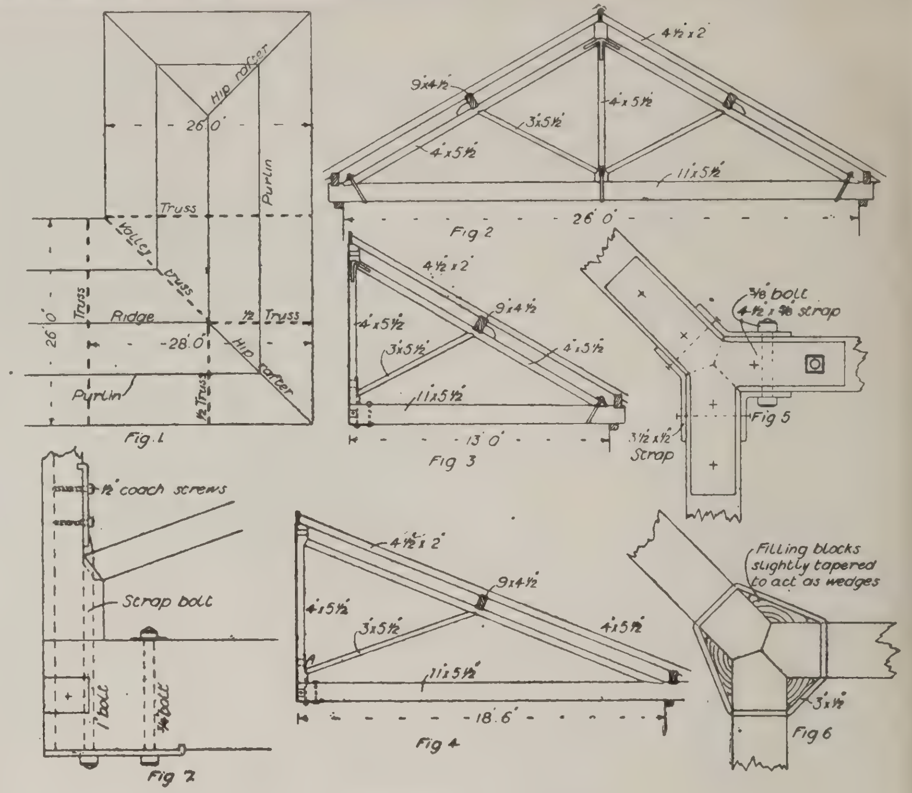
So far as we are aware, it is not.

Rights of Adjoining Owners.

Referring to the enquiry under this head on p. 288 of our issue for last week, A. H. writes: "If the buildings are in London, then, if a party wall had been raised by B, the London Building Act, 1894, would apply (see section 88 [6]), but since it would appear that B has built an external wall against A's external wall, not even that section will give any relief against the damage to the draught of A's chimney. The Prescription Act does *not* give A the right to passage of the smoke from his chimney over the land of B, except it has been so conducted over B's land in a confined channel or flue. A has obtained no right by user for his smoke to drift pathlessly over the land of A or any other of his neighbours. See *Bryant v. Lefever*, 4 C.P. Div. 172; *Webb v. Bird*, C.B.N.S. 284 and 841; and another case, *Bennett v. Hughes*, decided in July, 1886."

Arrangement of Trusses.

CARDIFF.—STUDENT writes: "The accompanying drawing shows half roof plan of a building. Kindly inform me how to deal with the portion of the roof between the two trusses shown. There are no supports under that portion."



ARRANGEMENT OF TRUSSES.

The plan of the junction of the two roofs is shown in Fig. 1 and the dotted lines show the proposed arrangement of trusses. The elevation of king-post truss for 26-ft. span is shown in Fig. 2, the elevation of one of the half trusses in Fig. 3, and of the valley truss in Fig. 4. The underside of the joint between the two half-trusses and valley truss is shown in Fig. 5, while Fig. 6 shows the joint at top of king-posts. An enlarged detail of joint A is shown in Fig. 7. The strap bolts to be 1in. diameter with 3ins. by ½in. strap. The other bolts ⅜in. diameter.

HENRY ADAMS.

Our Plate

The new Central Criminal Court.

The new Central Criminal Court in Old Bailey, which occupies the site of grim Newgate, is now complete, and only awaits official opening. Descriptions have been given in former issues of THE BUILDERS' JOURNAL, but in company with the general view of the building published as a centre plate in this issue we may give the following particulars:—The building is faced entirely with Portland stone, and the great dome which surmounts the whole group rises to a height of more than 200 feet, being crowned by a bronze-gilt figure of "Justice" by Mr. Pomeroy, who also is responsible for the sculpture work on the front to Old Bailey. Dignity and impressiveness have been considered of primary importance, and ornament has been sparingly used. The Newgate Street front is slightly curved, giving a pleasing effect of light and shade, and overcoming the difficulty of the awkward break in the building at this side. The main entrance in Old Bailey leads into a large hall with a wide corridor branching right and left, leading to various departmental rooms. From the entrance hall rises a fine marble staircase to the great hall on the first floor. This hall is the chief internal feature of the building. It is lined with magnificent slabs of marble and embellished with lunette paintings by Prof. Gerald Moira and Sir William Richmond. Following the plan of the ground floor, corridors, lined with marble, branch off on either side, and off these are the four courts—two large and two small, each with its own suite of rooms for counsel, jury, witnesses, &c.; the courts being top-lighted and panelled in oak, which is richly carved in parts.

The building is ventilated on Key's plenum system, the plant being one of the largest of its kind yet installed; it is capable of dealing with 20,000,000 cubic feet of air per hour.

The architect of the building is Mr. E. W. Mountford, F.R.I.B.A., of London, his design having been selected in competition in 1900. The general contractors were Messrs. Holloway Brothers. Among the sub-contractors were the following:—

Portland stone—Bath Stone Firms, Portland.
Ancaster stone — Thomson's Ancaster Quarries, Grantham.
Granite—J. Freeman & Co., Delauk Quarries, Cornwall, and Westminster.
Steel construction—Matthew, Shaw & Co., London; Dorman, Long & Co., Middlesbro'; Horsley Iron Co., Staffordshire; Redpath, Brown & Co., Edinburgh.
Marble wall linings, columns, &c., A. Lee & Bros, Hayes.
Marble staircase and floors—Anselm, Odling & Sons, London.
Scagliola columns—Bellman, Ivey & Carter, London.
Mosaic floors and ceilings—Rust's Vitreous Mosaic Co., London.
Tile wall linings and dadoes—Doulton & Co., London.
Heating and ventilation, William Key, Glasgow.
Hot-water drains—Wenham & Waters, Croydon.
Sanitary fittings—Doulton & Co., London.
Ironmongery—Carter & Aynsley, London.
Lead lights—Henry Hope & Sons, Birmingham.
Fibrous plaster and carving—Gilbert Seale, London
Bronze castings—J. W. Singer & Sons, Frome.
Cell fittings—C. Smith, Sons & Co., Birmingham.
Electric-light work and gas—H. J. Cash & Co. London.
Copper work—Braby & Co., London.
Lifts—Waygood & Co., London.
Court furniture—Hampton & Co., London.
Asphalting—Limmer Asphalte Co., London.

Working drawings of the building were reproduced in "Specification, 1906."

We think it will be generally admitte that Mr. Mountford has achieved a grea success in this noble building.

R.I.B.A. NOVEMBER EXAMS.

The following is the pass list for the November examinations of the Royal Institute of British Architects:—

The Preliminary Examination,

qualifying for registration as *Probationer R.I.B.A.*, was held in London and the provincial centres mentioned below on November 5th and 6th. 188 candidates were admitted, and 57 exempted. The remaining 131 were examined, with the following results:—

	Number Examined	Passed	Relegated
London	62	44	18
Birmingham	7	6	1
Bristol	8	5	3
Cardiff	6	5	1
Leeds	16	9	7
Manchester	20	13	7
Newcastle	12	9	3
	131	91	40

The passed candidates, with those exempted—making a total of 148—are as follows:—

J. B. Adams (Hanley)
P. J. Adams (Buckhurst Hill)
H. A. Ashford (Hoddesdon)
G. W. Bacon (Croydon)
G. F. Barker (Birmingham)
A. C. Beesley (Sheffield)
H. S. Besant (London)
F. Blake (London)
C. F. Boniface (Petersfield)
F. A. Brewerton (Manchester)
H. Brewis (London)
W. Burn (Rangoon, Burma)
P. N. Bushell (Birmingham)
E. H. Butcher (Standford-le-Hope)
D. A. Campbell (Liverpool)
P. J. Carey (Bromley)
W. D. Cathcart (London)
H. B. Cawthorne (Mexborough)
H. S. Chamberlain (Southsea)
T. C. Chamberlain (London)
H. F. Chandler (London)
G. D. Channon (Malton)
W. A. Cheers (Twickenham)
G. Cheesewright (Rotherham)
W. G. L. Cheriton (London)
S. Clark (Carlisle)
W. Clough, jun. (Keighley)
H. B. Coates (Altofts)
W. V. Coates (Grimsby)
B. P. Collin (Andover)
H. T. Cook (Chingford)
A. E. Cornell (Birmingham)
M. J. Cox (Godalming)
E. Crellin (Ramsey, I. M.)
H. W. Cruickshank (Aberdeen)
J. G. Dalziel (West Hartlepool)
O. F. Davidson (Newcastle-on-Tyne)
W. F. Davies (Chester)
O. R. Davis (London)
P. W. Davis (London)
W. W. Diggle (London)
W. R. Eckersley (Carlisle)
A. L. Edwards (London)
R. E. Eiloart (London)
A C. Farmer (Birkenhead)
G. H. Fawcett (Scarboro')
J. H. Fletcher (Hyde)
H. C. Fowler (Ryde, I.W.)
S. C. Garrett (Brighton)
J. D. Grant (Inverness)
B. Greenall (Manchester)
H. Gresswell (London)
C. T. Hall (Cardiff)
R. B. Hall (Batley)
J. J. Harries (Swansea)
L. Y. Harris (Nottingham)
J. A. Howell (Oxford)
F. Howorth (St. Anne's-on-Sea)
S. G. W. Hunt (Brighton)
D. F. Ingleton (Cardiff)
G. W. Jack (London)
J. H. Jackson (Leeds)
E. G. Jenkins (London)
S. Johnson (Birmingham)
W. S. Jones (London)
L. C. B. Joynson (Wednesbury)
H. Kelly (Carlisle)
H. F. King (London)
B. Knowles (Bootle)
I. T. Lawrence (Rhondda)
W. Lawson (Gateshead)
W. H. Letheren (Fareham)
P. H. Lomax (Bolton)
F. Lorn (Falkirk)
E. Loveluck (Bridgend)
M. Lyon (Birkenhead)
A. Lyth (Burslem)
G. G. Macfarlane (Glasgow)
R. MacKenzie (Lochlinchart)
C. McLachlan (London)
N. A. D. Maclean (Gaurock)
W.W. McNeil (Blackburn)
W. A. Malone (Belfast)
C. W. Marles (Sketty)
H. C. Marshall (Sunderland)
H. W. Martindale (Bournemouth)
L. D. Martyn (Tiverton)
S. P. Mather (Mill Hill)
J. R. Maughan (Hexham-on-Tyne)
G. M. Mayhew (Hitchin)
L. E. Montenius (London)
J. Moodie (Goodmayes)
H. B. T. Morgan (London)
H. H. Morley (London)
H. F. Mott (Plymouth)
H. M. Nash (Farnham)
F. B. Nightingale (London)
V. O'Dwyer (Leeds)
R. Ordish (Derby)
P. P. Patey (Hereford)
H. R. Peerless (Reigate)
P. Pell-Ilderton (Manchester)
A. V. Pusill (Llandudno)
H. O. M. Pym (Nottingham)
J. Quekett (Dublin)
M. Ravenscroft (Oxton)
A. H. Rayment (London)
A. Revie (Airdrie)
W, Rhind (London)
F. A. Richards (London)
B. W. Ridley (Nottingham)
G.W. Ridley (Nottingham)
R. P. Rosling (Bristol)
R. T. Russell (London)
W. A. Rutter (Cardiff)
H. S. Sawyer (Carlisle)
J. Seddon (Thornton Heath)
H. P. Shapland (London)
R. Shears (Westcliff-on-Sea)
H. W. Sheffield (Earls Barton)
H. J. Shepherd (Sheffield)
C. T. Sherwin (Stafford)
W. J. Smith (Newcastle-upon-Tyne)
G. M. Stewart (Glasgow)
J. T. Stone (London)
A. D. Stuart (London)
J. Sutcliffe (St. Anne's-on-Sea)
E. Swann-Watts (St. Anne's-on-Sea)
W. E. Sykes (Cottingham)
F. Tapping (Aylesbury)
H. A. Thomerson (London)
L. Tigar (Southampton)
T. E. Turner (Solihull)
M. T. Violet (Stafford)
F. Waldrow (Enfield)
R. L. Wall (Upper Tooting)
A. G. Waller (London)
T. W. Waller (Birmingham)
H. A. Welch (London)
E. G. Wildin (Stoke-on-Trent)
E. W. Willcox (Bristol)
E. Williams (Swansea)
S. Williams (London)
W. E. Willis (Bristol)
J. Wilson (London)
D. C. Winter (Westcliffe-on-Sea)
A. Wintle (Twickenham)
T. Wrigley (St. Anne's-on-Sea)

The Intermediate Examination

qualifying for registration as *Student R.I.B.A.* was held in London and the undermentioned provincial centres on November 5th, 6th, 8th, and 9th. 144 candidates presented themselves and were examined, with the following results:—

	Number Examined	Passed	Relegated
London	93	40	53
Bristol	13	8	5
Dublin	2	2	0
Leeds	13	5	8
Manchester	16	7	9
Newcastle	7	3	4
	144	65	79

The 65 successful candidates have been registered as *Students R.I.B.A.* Their names, which follow, are given in order of merit, as placed by the Board of Examiners:—

D. W. Ayre (Cork)
S. H, H. Ixer (London)
J. L. Denman (Brighton)
H. Boddington (Wilmslow)
E. R. Green (London)
S. A. Neave (London)
C. R. Merrison (London)
G. E. Hunter (Gosforth)
E. W. Wray (London)
W. R. Mann (Leicester)
D. N. Dyke (London)
J. B. Richardson (Shotley Bridge)
A. R. Widdowson (Leicester)
H. W. Hallas (Huddersfield)
F. L. W. Cloux (London)
F. H. Healey (Bradford)
F. C. Mason (London)
W. H. Louw (Paarl, Cape Colony)
H. Savage (London)
J. G. Martin (Oldham)
J. A. Davidson (Co. Down)
G. B. Selleck (Plymouth)
O. White (Birmingham)
A. G. Warnham-Tickle (London)
F. H. Brazier (Addlestone)
H. S. Fleming (Erith)
A. W. Fulton (Liverpool)
W. T. Higgins (Stony Stratford)
F. E. S. Munt (London)
E. J. E. Moore (Newport, Mon.)
J. G. Allen (London)
R. F. Bargman (London)
R. H. P. Bevis (London)
A. H. Boss (London)
H. H. Christie (Liverpool)
F. W. Commin (Exeter)
H. Edmonds (Kidderminster
W. Goodchild (Ipswich)
C. F. Gurney (Leeds)
E. H. Hawkins (London)
N. Heppenstall (Milnsbridge)
G. Hollins jun. (Newcastle, Staffs)
R. J. Hughes (Tonypandy)
C. M. Jones (Swindon)
H. F. Kohler (London)
G, E. G. Leith (London)
C. J. Mole (Plymouth)
D. H. Morgan (Aberdare)
A. S. Padfield (Cardiff)
H. W. Parnacott (London)
T. L. Pearce (London)
A. J. Perren (London)
N. A. Rew (Great Berkhamsted)
A. K. Robertson (Edinburgh)
B. Robson (Scarborough)
D. G. J. Saw (London)
E. D. Sherlock (Manchester)
L. A. D. Shiner (Grays)
R. G. P. Smith (Reading)
E. A. Taylor (London)
A. Walmsley (Haslingden)
J. L. Warry (London)
H. West (London)
J. E. Whitehead (Sheffield)
J. H. Wyeth (Epsom)

Exemptions from the Intermediate Examination.

In accordance with the new regulations, the following Probationers, possessing Degrees or Certificates, were exempted by the Council from sitting for the Intermediate Examination, and have been admitted as *Students R.I.B.A.*:—

L. K. Adams (Birkdale)
H. Berton-Benjamin (London)
B. H. Collcutt (London)
B. M. Goodwin (Croydon)
H. B. T. Morgan (London)
H. H. Scott-Willey (Reigate)
F. Thorp (Southport)
A. Welford (London)

The Final and Special Examination

was held in London from November 15th to 23rd, with an interval of one day between the Written and Oral Examination. Of the 90 candidates examined, 50 passed, and 40 were relegated in various subjects. The following are the names of the 50 passed candidates, the * against a name signifying that the candidate entered for the Special Examination designed for architects in practice and chief assistants exempted by the Council from the Preliminary and Intermediate Examinations and from submitting Testimonies of Study:—

A. J. T. Abel (Tooting)
*W. T. Armstrong (Lancaster)
T. S, Attlee (Putney)
G. S. H. Bradford (London)
E. B. Crossley (Nottingham)
T. L. Dale (London)
H. A. Dalrymple (Grays)
N. J. Dawson (Chelmsford)
*A. C. Denny (Dumbarton)
C. M. Drewitt (Southport)
P. M. Fraser (London)
J. T. Halliday (Southport)
J. H. Hargreaves (Manchester)
D. P. Hayworth (London)
J. R. Hobson (New Eltham)
W. A. Hodges (London)
J. N. Horsfield (London)
C. E. Howitt (Nottingham)
S. Jaques (London)
N. Jones (Southport)
P. H. Keys (London)
H. Langman (Southport)
L, A. Loades (Morpeth)
R. A. Loveitt (Dartford)
C. E. Lovell (Gravesend)
W. G. Milburn (London)
A. S. Millar (London)
P. Minor (Manchester)
*C. L. T. Morgan (London)
*A. E Munby (London)
N. T. Myers (Watford)
G. Nott (Leicester)
C. H. Perkins (Carlisle)
A. P. H. Pierce (London)
*J. C. Reid (Glasgow)
H. P. Roberts (Horsham)
*P, T. Runton (Hull)
*W. T. Sadler (London)
I. F. Sifton (London)
J. Myrtle Smith (London)
A. K. Tasker (North Shields)
D. L. Solomon (London)
R. W. Thorp (London)
F. J. Toop (London)
J. I. Tweedie (Annan)
C. P. Wade (Yoxford)
F. Wade (Bradford)
S. J. Wearing (Leicester)
A. F. Wickenden (Maidstone)
W. B. Wyllie (London)

The following table shows the number of failures in each subject among the forty relegated candidates in the Final Examination:—

I.	Design	30
II.	Mouldings and Ornaments	24
III.	Building Materials	13
IV.	Principles of Hygiene	17
V.	Specifications	13
VI.	Construction, *Foundations, &c.*	15
VII.	Construction, *Iron and Steel, &c.*	21

The Ashpital Prize.

On the recommendation of the Board of Examiners the Council propose to award the Ashpital Prize to Mr. James Theodore Halliday, of Stockport, "as having most highly distinguished himself" in the current year's Examinations.

Obituary

Mr. James Perry, county surveyor, of Galway, died recently, aged 61. He had been an examiner in building construction for South Kensington and contributed the articles on these examinations which appeared in our columns some time ago. He was a very able engineer, possessing considerable scientific attainments. His brother is Prof. John Perry, the well-known electrician and professor of the Royal College of Science.

The Strand Improvement Scheme.—The London County Council discussed at its meeting last week the suggestions of the further Strand Improvement Committee for altering the line of frontage of the northern side of the Strand between Wellington Street and St. Clement Danes. An amendment was brought forward to defer to the opinion of the many eminent architects, artists and others who had supported the proposal, but the Council rejected this, and adopted, by a large majority, the recommendation of its Improvements Committee not to alter the present arrangement.

Modern Buildings with Steel Construction—A paper on this subject was read by Mr. John Bowman before the Glasgow Technical College Architectural Craftsmen's Society on November 30th. Mr. Bowman dealt more particularly with the erection of the Edinburgh Life Assurance Co.'s building in St. Vincent Street, Glasgow (see our issue for November 28th). The architect of this building was Mr. John A. Campbell, I.A., F.R.I.B.A., with whom Mr. Bowman has been clerk of works for many years. The lecturer described in detail the foundations of the various steel-built columns which carry the entire building, eight storeys in height. About two-thirds of these columns go down to solid rock, the remainder being carried by reinforced concrete foundations 12ft. wide by 4ft. thick (or deep) over blue clay. Mr. Bowman afterwards dealt with the steel framing of the building. Fire-resisting construction was adopted throughout, the columns being encased in brickwork built in cement, and the girders in cement concrete. The floors and roof—which is flat—are of patent tubular fire-resisting construction.

Notes on Competitions

High School for Girls, Liscard.

Designs for this school are being invited in competition from a limited number of local architects who have had experience in school planning. A competent assessor will be appointed.

Rebuilding of Henshaw's Blind Asylum, Old Trafford, Manchester.

About twenty designs have been submitted in this competition, which is limited to Manchester architects. The assessor is Mr. John Holden, F.R.I.B.A., and his awards will be made known some time this month.

High School for Girls, Barnsley.

The forty-nine architects from various parts of the country who were specially invited have now submitted their designs for the above school. The assessor is Mr. E. R. Robson, of London.

Proposed Central Library, Birkenhead.

A competition is to be held for this building. It will be limited to architects resident or in practice in Birkenhead.

The New County Hall.

In a letter to the *Standard*, commenting on the report of the London County Council proceedings in regard to the new County Hall at last week's meeting, Mr. Horace T. Bonner, A.R.I.B.A., says: "With regard to the statement by Mr. Cleland, M.P., that he hoped to be able to bring up in a fortnight's time the names of the architects selected to prepare competitive designs, I have to say that inasmuch as this is a public competition—open to all the world—and as the conditions even of the competition will not be ready (according to a reply to my inquiry from the clerk to the Council) until early in 1907, I cannot understand how, or why, any architect should be now 'selected.' If any is so 'selected' immediately, it will be a manifest injustice to the other competitors who are to be invited by public advertisement. Any one being now selected means having the advantage of many extra months of study, and, possibly, earlier information in an underground way of the Council's requirements. Let every London architect protest against this unfairness."

Bangor University College.

The designs for new buildings at Bangor University College submitted by four of the five architects invited to compete were assessed by Sir Aston Webb last week. The fifth competitor did not send in a design.

Princes Street Promenade, Edinburgh.

The Princes Street promenade proposal at Edinburgh has come in for strong criticism and objection on the part of the Council of the Cockburn Association, who are averse to the present scheme being proceeded with and suggest that, in any case, if the idea is to be carried out, there shall be an open competition for the design.

Perth City Hall.

The Perth Town Council made another attempt last week to solve the apparently never-ending problem of the City Hall. At a former meeting the Council by 11 votes to 3 (12 declining to vote) adopted design No. 2, by Messrs. Menart & Jarvie, of Perth, the minority being in favour of design No. 1, that of Mr. Sibbald, Dundee. It will be remembered that Mr. Burnet, the assessor, awarded first place to Mr. Sibbald's design for reconstruction. At last week's meeting Dean of Guild Barlas moved that design No. 2 (by Messrs. Menart & Jarvie) be adopted, and Councillor Thomson seconded. Councillor Rollo, who moved that Mr. Sibbald's plan of reconstruction be approved, said the Council had paid £50 to the assessor, who was better qualified to know which was the better plan. Councillor Calderwood seconded. On a vote, 10 voted for design No. 2 and 3 for design No. 1, 11 declining to vote.

List of Competitions Open.

Deposit for conditions given where known.

DATE OF DELIVERY	COMPETITION.
Dec. 31	LABOURERS' COTTAGES AT DUBLIN.—Premiums of £50, £30 and £20. Particulars from A. R. Barlas, secretary, L.G.B. Offices, Dublin. No deposit.
Dec. 31	DUAL SECONDARY SCHOOL AT GOOLE.—Premiums £50 and £25. Particulars from James W. Johnson, clerk to Governors, Council Offices, Goole. Deposit £2 2s.
Dec. 31	NURSES' HOME AT GENERAL HOSPITAL, WOLVERHAMPTON.—Particulars from J. Stephen Neil, House Governor and Secretary, General Hospital, Wolverhampton. No deposit.
Dec. 31	BATHS AT ASHTON-IN-MAKERFIELD.—Limited to architects in Wigan and Leigh Poor Law Unions. Particulars from A. Sykes, clerk, Council Offices, Ashton-in-Makerfield. No deposit.
1907 Jan. 12	LAY-OUT OF RIDDRIE ESTATE, GLASGOW.—Premiums of £75, £50 and £25. Particulars from A. W. Myles, town clerk, City Chambers, Glasgow. No deposit.
Jan. 19	LIBRARY AT PLYMOUTH.—Premiums £50, £30 and £20. MUSEUM AND ART GALLERY AT PLYMOUTH. Premiums £25, £20 and £10. Limited to local architects. Particulars from Borough Librarian, Plymouth.
Feb. 1	CHILDREN'S HOSPITAL AT SUNDERLAND.—Premiums of £100, £50 and £25. Particulars from T. Robinson, secretary, Infirmary Offices, Bank Buildings, Sunderland. Deposit £1 1s.
No date.	CONGREGATIONAL CHURCH, SCHOOL AND MANSE, GRIMSBY.—To cost £8,200. Premiums of 25, 15 and 10 guineas. Particulars from E. L. Bridge, Fish Docks, Grimsby. Deposit £2 2s.

ANOTHER COTTAGE EXHIBITION.

A Model Cottage Exhibition is to be held next year at Walker, Newcastle-on-Tyne, under the auspices of the National Housing Reform Council. It is hoped to open the Exhibition in June. There will be three classes of cottages, namely:—

(*a*) Cottages with large living-room, 2 bedrooms and scullery, with bath, to cost £185;

(*b*) cottages with large living-room, 3 bedrooms and scullery, with bath, to cost £225;

(*c*) cottages with large living-room, parlour, 3 bedrooms and scullery, with bath, to cost £250;

the cost in each case to include architect's fees and builder's profits, but not land nor roads.

There will also be a special class of cottages for young married people or aged people, these cottages to cost £150, and to contain living-room, bedroom and scullery, with bath.

For the planning of the site on model lines there will be a preliminary competition. The average number of houses will be 12 to the acre, so as to secure good garden space to each cottage.

Furniture and gardening competitions will be arranged, and there will be an exhibition of building materials.

The awards, instead of being money prizes (which the promoters do not consider to be the most satisfactory method), will be in the form of gold, silver and bronze medals, with a limited number of diplomas.

With regard to the cost of the cottages, bearing in mind the dissatisfaction expressed by some visitors at the Letchworth exhibition, the promoters have decided to make it a condition that exhibitors, if called upon, shall sell the cottages erected to the Housing Committee of the Newcastle City Council at the price stated in the catalogue, and also, if called upon to do so, shall build for the Housing Committee on the adjoining estate not more than 12 cottages at the stated price. A fee of two guineas per cottage will be charged to exhibitors, while the entrance fee for the exhibition planning competition will be 10s. 6d.

The by-laws under which the cottages will be erected are those of the Newcastle City Council, and copies of these will be sent to all competitors. They are among the most stringent in the North of England, and therefore the cost of cottages built under them will be a representative cost throughout the districts which the exhibition will serve.

IN PARLIAMENT.

(By our Press Gallery Representative.)

Norwegian Granite in Public Works.

Mr. Hugh Law asked the President of the Local Government Board whether he was aware that some local authorities were accustomed to specify Norwegian granite for use in public works under their control; and whether, in view of the existence of undeveloped quarries of suitable granite in Great Britain and in Ireland, he would circularise local authorities and point out the undesirability of giving this undue preference to foreign quarry owners.

Mr. John Burns replied that he understood that in some localities Norwegian granite was cheaper than other similar stone, and he presumed it was upon this ground that some local authorities preferred to use it. He could not undertake to interfere with the exercise of their discretion in the matter.

The Scottish Laws Courts.

Replying to Mr. Charles E. Price, respecting the proposed alterations at the Scottish Law Courts in Edinburgh, Mr. Harcourt, First Commissioner of Works, said that certain plans had been prepared which had been seen by the Faculty of Advocates and altered to meet their views. They were under the most careful consideration, but at this moment he was not able to make a more definite announcement.

Irish Buildings.

The Commissioners of Public Works in Ireland, in their annual report dated July 28th, 1906, just issued, state that the whole of the plans for the new Royal College of Science for Ireland have been completed and are in the hands of the quantity surveyors.

The new buildings in connection with Queen's College, Belfast, have been erected as a continuation of the northern wing of the College, and are now nearly complete.

At forty ancient monuments repairs had been carried out—in particular at Holy Cross Abbey.

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Electrical Notes.

Steel Conduits for Electric Wiring.

The use of steel conduits for electric wiring has now become so general that the cumbersome old wood casing is fast disappearing. The new system has a great many points in its favour, not the least being the rapidity with which it enables work to be executed, the excellent insulation it provides, the protection assured against injury and fire, and the accessibility for inspection which is possible with this system; it is also very neat in appearance. Among firms who have made a speciality of this class of work are Messrs. Strode & Co., of Osnaburgh Street, Regent's Park, N.W. During the past few years they have carried out a great number of important installations, and in the course of their experience have introduced many improvements in fittings. One of their most important installations is at the Savoy Hotel, where there are more than 50 miles of steel conduit. They also did the whole of the electric wiring, bells and telephones at the new Naval College at Dartmouth. Messrs. Strode are also putting in their installation into the new "Morning Post" building.

A new Wall Plug.

A particularly neat wall and skirting-board socket and plug has just been brought out by the Edison and Swan United Electric Light Co., Ltd. Its special feature is that, instead of the whole fitting protruding at right angles to the base, like the older-fashioned plugs, this new fitting is so arranged that the plug fits into its socket parallel to the wall, and thus has a very much neater appearance: moreover, it is not so liable to damage as the older type. The plug is of strong ebonite, with a highly-efficient grip arrangement for the cord, and the socket may be obtained in three different varieties—namely, in plain porcelain without cover, with cover, and with cover and lid. The fitting is very well finished, and is probably the most efficient socket on the market from the point of view of insulation, being made of highly-glazed porcelain, with the contracts sunk to prevent the possibility of short-circuiting. The fitting is enclosed in a metal cover adapted for easy fixing, and the hinged metal lid with which it can be fitted can be pushed over to cover the terminals when the plug is withdrawn.

The new Power Station at Greenwich.

The new electricity generating station at Greenwich for the London County Council tramways will be a very large installation when complete. The total estimated cost is put at £900,000. At present only half the station is built. There are twenty-four 5-drum Stirling boilers of 200lbs. pressure, and four steam generating sets of 3,500kw. capacity each. These generators are of revolving field type delivering 3-phase current at 6,600 volts between phases, 25 cycles per second. Provision is made for eight generators and thirty-two feeders. For the second portion of the station it is proposed to use turbo-generators of a total capacity of 20,000kw. The sub-station contains three motor-generators of 500kw. capacity, supplying direct current at 550 volts. There is a battery of 280 Tudor cells. Coal for the station can be landed from a pier at the rate of 1,000 tons per day, electric coal-handling machinery being provided.

A new London "Tube."

The newest electric "tube" railway in London is the Great Northern, Piccadilly and Brompton, which extends from Hammersmith, through Earl's Court, South Kensington, Hyde Park Corner, Piccadilly Circus, Covent Garden, Holborn, Russell Square, King's cross, Caledonian Road, Holloway Road, to Finsbury Park. A feature of the line is the double spiral electric moving track at Holloway Road station: this travels at the rate of 100ft. per minute and will take passengers up and down simultaneously, being fitted in lieu of lifts.

Institution of Electrical Engineers.

The 18th annual dinner of the Institution of Electrical Engineers was held last week. Dr. R. T. Glazebrook, F.R.S., the president, occupied the chair. Mr. Babington Smith, in proposing the toast of the institution, said that with the prospects of advance and development in all branches of electrical science which lay before them, he thought he could predict a prosperous future for the institution. The president, in responding, said the institution had among its leaders many great engineers, who recognised the debt they owed to other distinguished members of the institution, sometimes called the professors. It seemed to him that the progress of the institution had been great and rapid because it had known how to combine in due proportion the efforts of both those classes.

THERE ARE THINGS ONE CANNOT FORGET!

One of them is this:

"ROYAL EDISWAN"

ELECTRIC LAMPS

are the Best and Cheapest in the end.

NOTE.

THE FOLLOWING IS A RECENT EXTRACT FROM THE "ELECTRICAL REVIEW."

EDISWAN LAMPS.—In connection with the independent tests just concluded by the Westminster Electrical Testing Laboratory, York Street, Westminster, we understand that the "Royal Ediswan" Lamp comes out at the top of the list. The mean results of all the lamps tested show that this well-known lamp gives the best results under all headings, such as regularity of manufacture, life, and last, but not least, economy in watts per candle-power.

Complete List of Contracts Open.

WITH a few exceptions, news of Contracts Open are not repeated after they have been published once in these columns, so that **readers will find particulars in our previous issues of other contracts that still remain open.**

Unless expressly stated to the contrary, all deposits required for bills of quantities, &c., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair-wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

Dec. 14. Launceston.—*Erection of a drill hall* at Launceston. The plans, specifications and conditions may be seen at the office of O. B. Peter, architect, Launceston, to whom sealed and endorsed tenders should be sent on or before Dec. 14.

Dec. 14. Cork.—*Making, supplying, and fixing benches* in City Hall, Albert Quay, Cork, in strict accordance with the plan, specification, and conditions of contract prepared by the City Engineer. General conditions, specification, and drawings can be seen in the City Engineer's Office, City Hall, from 10 to 4 daily, where tender forms will be issued. Intending contractors must first lodge with the City Treasurer the sum of £1. Fair wages clause. Sealed proposals, endorsed "Tender for Benches for City Hall," must be deposited with F. W. M'Carthy, town clerk, City Hall, before 2 p.m. on Dec. 14. Irish materials must, as far as practicable, be used in the execution of the work.

Dec. 17. Blackpool.—*Alterations and extensions* to Police Station, South Shore, for the Watch Committee, in acordance with plans, which can be seen, and copies of specifications and bills of quantities, which can be obtained, on application to J. S. Brodie, borough surveyor, Town Hall, Blackpool, and on a deposit of 10s. 6d. Sealed tenders, addressed to the Chairman of the Watch Committee, care of J. S. Brodie, endorsed "South Shore Police Station," should be delivered not later than 10 a.m. on Dec. 17.

Dec. 17. Rustington.—*Erection of two cottages*, at Rustington, Sussex, according to the plans and specifications prepared by H. G. Heal, surveyor, Worthing and Littlehampton, which can be seen at the offices of E. B. Wannop, Esq., solicitor, Littlehampton, daily, except Saturday, between the hours of 10 and 4. Sealed tenders must be delivered before 4 p.m. on Dec. 17.

Dec. 19. Kington.—*Additions and alterations to* the Lady Hawkins' Grammar School. The works comprise two new class-rooms, cloak-rooms, offices, and a workshop, and certain consequential alterations. Plans and specifications of the proposed works can be seen at the School House daily between 10 a.m. and 4 p.m., and bills of quantities and form of tender can be obtained on application to A. Dryland, Shirehall, Hereford, upon the payment of a deposit of £2 2s. Sealed tenders, endorsed "Tender for Alterations," must reach T. Mahir, clerk to the governors, Grammar School, Kington, before 10 a.m. on Dec. 19.

Dec. 19. Scalby.—*Rebuilding and widening* of Newby Bridge (stone), at Scalby, near Scarborough, on the Whitby and Scarborough main road. Contractors desirous of tendering may see the plans and specification and obtain bills of quantities at the County Surveyor's Office, County Hall, Northallerton, until Dec. 19, between 9.30 a.m. and 4 p.m., Saturday, until 12 noon.

Dec. 19. Maldon.—*Deepening a well* at the Wantz Road Pumping Station, for the Town Council. Plan and specification may be seen at the office of T. R. Swales, borough surveyor, London Road, Maldon. Tenders, endorsed "Tender for Well," to be delivered to F. H. Bright, town clerk, Town Clerk's Office, High Street, Maldon, on or before Dec. 19.

Dec. 21. Belfast.—*Providing and erecting additional fencing* at Carmoney New Burial Ground, in accordance with plan and specification, which may be seen of J. W. Robb, clerk to Belfast Burial District Council, Clerk's Office, Union Workhouse. Sealed tenders to be lodged with him not later that 12 noon on Dec 21.

Dec. 22. Burnley.—*Erection of proposed technical school* in Omerod Road, Burnley, for the Education Committee. Drawings may be seen and specifications, bills of quantities, and forms of tender obtained at the office of the Borough Engineer, G. H. Pickles, A.M.I.C.E., on payment of £1 1s. Tenders endorsed "Wagon Shed," to be delivered and addressed to the Chairman of the Education Committee, must be delivered at the Town Clerk's Office, Town Hall, not later than 9 a.m. on Dec. 22.

Dec. 22. Callington.—*Erection of a new secondary school* at Callington, for the Cornwall Education Committee, according to plans and specifications which may be seen at the office of J. Sansom, architect to the Committee, Liskeard, from whom all particulars relating to the work may be obtained. Sealed, endorsed tenders on official forms, which may be had from the architect, are to be sent to F. R. Pascoe, secretary, Education Office, Truro, on or before Dec. 22.

Dec. 28. Hove.—*Erection of public library* in Church Road, Hove, in accordance with plans, specification and bill of quantities prepared by the architects, P. Robinson, F.R.I.B.A., and W. Alban Jones, of Yorkshire Post Chambers, Leeds. Plans and specification may be seen and bills of quantities, at the office of H. H. Scott, borough surveyor, on payment of £1 1s. Tenders, on forms supplied, endorsed "Tender for Erecting Proposed Library," addressed to H. Endacott, town clerk, Town Hall, Hove, will be received up to 6 p.m. on Dec. 28.

Dec. 31. London, S.E.—*Erection of a branch library* at Hither Green S.E. The drawings and specifications of the building can be inspected either at the offices of H. Hopton, architect, 37, Ringstead Road, Catford, S.E., or of C. O. Robson, quantity surveyor, 33, King Street, Cheapside, between 10 and 4. A copy of the quantities can be obtained at the office of the quantity surveyor on payment of £2 2s. Sealed tenders, accompanied by the priced bills of quantities (also sealed), and addressed to the Clerk to the Committee, are to be delivered at the Town Hall, Catford, on or before Dec. 31. Fair wages clause.

Jan. 15. Enfield.—*Erection of a junior mixed school* at Bush Hill Park, Enfield. Applications for bills of quantities should be sent to G. E. T. Laurence, architect, 22, Buckingham Street, Adelphi, W.C., before Dec. 29, from which date the plans and specification can be seen at the above address. A deposit of £1 1s. should accompany the application. Sealed tenders, on the form supplied, must be delivered to N. Hepworth, clerk, Public Offices, Enfield, free of charge, not later than 12 noon on Jan. 15. The contractor whose tender is accepted will be required to enter into a bond with two sureties in the sum of £200 each for the due performance of the contract.

April 2. Bombay.—*Construction of a reclamation* between Mazagon and Sewri, for the Trustees of the Port of Bombay. The contract will include the building of a rubble masonry quay wall about 12,600ft. long on piled foundations and the reclamation of about 518 acres of the foreshore; such reclamation to be effected by silt or mud pumped or dredged from the bed of the harbour, and covered with a layer of good earth. Copies of the specifications and drawings of the work can be obtained from the Chief Engineer, Bombay Port Trust, Ballard Road, Bombay, or from Sir J. Wolfe Barry and A. J. Barry, trustee's consulting engineers, 7, The Sanctuary, Westminster, S.W., on payment of £5 sterling. Tenders, which must be endorsed "Tenders for Mazagon-Sewri Reclamation," and accompanied by a deposit of Rs. 10,000 (£666), will be received by the Secretary, Bombay Port Trust, Bombay, up to 5.30 p.m., or by the Trustees' Consulting Engineers up to noon on April 2.

No date. St. Anne's-on-Sea.—*Erection of "New Carey Hall,"* Barrow Island, for the Barrow Island Baptist Mission, on a site in Ramsden Dock Road. Through tenders for the whole of the trades only will be accepted. Contractors desirous of tendering are requested to apply "at once" for bills of quantities and further particulars, to Rev. W. Walker, 34, Oxford Street, Barrow-in-Furness, or, W. Wade and F. Howorth, architects, Bank Chambers, The Square, St. Annes-on-Sea.

No date. Dyffryn.—*Erection of new offices* and carrying out drainage work at the Dyffryn Council School, for the Merioneth Education Committee. The plans, specification, and further particulars may be obtained on application to A. M. H. Jones, M.S.A., county architect, Plas Ynys, Borth, R.S.O.

No date. Nottingham.—*Erection of 3 houses*, Wells Road Nottingham. Persons desirous of tendering should send, stating trade, to F. Mitchell, architect and surveyor, 9, Upper Fountaine Street, Leeds, and quantities will be forwarded when ready.

No date. Corwen.—*Erection of boundary walls* around the new playground at the Corwen Council School, for the Merioneth Education Committee. The plans, specification, and further particulars amy be obtained on application to A. M. H. Jones, M.S.A., county architect, Plas Ynys, Borth, R.S.O.

ENGINEERING.

Dec. 17. Portsmouth.—*Construction and maintenance* of an overflow weir chamber on the existing main low-level sewer, an underground pumping station, and other works, for the Borough of Portsmouth. The specification, form of tender, and bill of quantities may be obtained from A. Hellard, town clerk, Town Hall, Portsmouth on payment of a sum of £2 2s. The drawings may be seen, and further information obtained, upon application at the offices of Bramwell & Harris, 5, Great George Street, Westminster, S.W. Tenders under seal, and endorsed "Tenders for Works for the Prevention of Storm Water Flooding in the Low-lying area of Southsea, Contract No. 3," must be delivered to the Town Clerk at or before 12 on Dec. 17

Dec. 17. Castleblayney.—*Construction of a storage reservoir*, filters and clear water tank, providing and laying cast-iron pipes, &c., for the U.D.C., according to plans and specifications prepared by F. Bergin, B.E., 36, Westmoreland Street, Dublin, which can be seen at the office of B. M'Ardle, clerk of Council, Courthouse, Castleblayney, during ordinary office hours. Tenders, accompanied by a schedule of prices, and containing the names and addresses of two solvent securities willing to join in a bond of £1,000, or a Guarantee Society bond for the same amount, for the due performance of the contract, will be received by the Clerk up to 12 noon on Dec. 17. Tenders should be addressed to the presiding Chairman and endorsed "Tender for Castleblayney Sewerage and Waterworks," and no tender will be considered which is not on the proper form, to be had from the Clerk for a payment of £1. As the Council have decided on joining the schemes in one contract, the aggregate amount in tender for sewerage and waterworks will be the deciding price.

Dec. 20. Belgium.—*Erection of metallic structures* on the quay-side at an estimated cost of 207,500 francs (£8,300). The specification (*Cahier des Charges*) relating to the contract may be obtained from the Hôtel de Ville, Antwerp, price 1 franc. Tenders should be sent in sealed registered envelopes, addressed "A Monsieur le Bourgmestre de la Ville d'Anvers," and should reach the Hôtel de Ville not later than Dec. 20. A deposit of 20,000 francs (£800) is required to qualify any tender. A copy of the specification may be seen at the offices of the Commercial Intelligence Branch of the Board of Trade, 73, Basinghall Street, London, E.C.

Dec. 21. Derby.—*Erection of new electric power station*, Silk Mill Lane. Plans may be seen, and form of tender, specification, and bill of quantities obtained, on application at the office of J. Ward, M.Inst.C.E., borough surveyor, Babington Lane, Derby, and upon the deposit of £1 1s. Tenders, endorsed "Power Station," are to be delivered in the special envelope provided for the purpose at the office of G. T. Lee, town clerk, Town Clerk's Office, 15, Tenant Street, Derby, not later than 10 a.m. on Dec. 21.

Dec. 22. Stockport.—*Electric light wiring and telephones* in connection with the new Town Hall, in accordance with specifications and schedules prepared by A. B. Thomas, architect, 5, Queen Anne's Gate, Westminster, S.W. Copies of the particulars for tender can be obtained of R. Hyde, town clerk, Town Clerk's Office, Stockport, or at the offices of the architect, on payment of a deposit of £1 1s. for each separate list. Tenders must be delivered to R. Hyde not later than noon on Dec. 22. Fair wages clause.

Dec. 31. Ashton-under-Lyne.—*Construction of an embankment*, &c., for the formation of a reservoir, and for other works on and about the Chew Brook, 3½ miles or thereabouts from the Friezland Station of the London & North-Western Railway, for the Joint Committee of the Ashton-under-Lyne, Stalybridge, and Dukinfield (District) Waterworks. Drawings can be seen and copies of the specification, schedule, and form of tender may be obtained at the offices of G. H. Hill & Sons, civil engineers, Albert Chambers, Albert Square, Manchester, and 3, Victoria Street, Westminster, upon receipt of cheque for £5 5s. Sealed tenders, endorsed "Tender for Chew Reservoir and Works," must be addressed to and forwarded to W. H. Rothwell, secretary to the Joint Committee, Town Hall Chambers, Ashton-under-Lyne, on or before Dec. 31.

Jan. 3. York.—*Construction of the Selby and Goole Railway*, about 10 miles in length, for the North-Eastern Railway. The works comprise double-line railways chiefly on embankment (upwards of 1,000,000 cubic yards), with stations, station yards, warehouses, cottages, and other buildings, sidings, and bridges. The steelwork of the latter will amount to about 1,100 tons. Plans may be seen, and specification, detailed quantities, and form of tender obtained, on personal application at the office of W. J. Cudworth, Company's engineer, York. Sealed tenders, marked "Tender for Selby and Goole Railway," to be addressed to R. F. Dunnell, secretary, and delivered at his office at York not later than noon on Jan. 3.

Jan. 16. Spain.—*Construction of an iron bridge* over the river Arevalillo, on the road from Villacastin to Vigo, at the estimated cost of 56,975 pesetas (about £2,071). Tenders will be opened on Jan. 16 at the Directorate General of Public Works, Madrid. Plans and specifications are on view at the above-mentioned office; conditions of tender are set forth in the "Gaceta." Local representation is necessary. The "Gacetas" may be seen at the Commercial Intelligence Branch of the Board of Trade, 73, Basinghall Street, E.C.

Jan. 19. Bridlington.—*Supply and erection of two sets* of deep-well pumping machinery, to be driven by steam, suction gas, or electricity, for the Corporation. Copies of specification, forms of tender, and permits to view the site, may be obtained of A. E. Matthewman, town clerk, Town Hall, Bridlington, on payment of £2. Tenders, endorsed "Tender for Pumping Machinery," are to be addressed to the Chairman of the Waterworks Committee and delivered at the Town Clerk's Office not later than Jan. 19.

No date. Aberdovey.—*Carrying out ventilation work* at the Aberdovey Council School, for the Merioneth Education Committee. The plans, specification, and further particulars may be obtained on application to A. M. H. Jones, M.S.A., county architect, Plas Ynys, Borth, R.S.O.

No date. Redhill.—*Fire escape staircases* at the Workhouse, Earlswood, Redhill, for the Guardians of the Poor of Reigate Union. Copies of plans and specification can be obtained on application to E. Penfold, A.R.I.B.A., architect, High Street, Reigate, Surrey.

Dec. 15. Handsworth.—*Supply, delivery and erection* of the following plant at their electric power station, for the U.D.C. Contract No. 15—Extension water-tube boilers (two); Contract No. 16—Extension engine (500 i.h.p.) and dynamos (one 315 kw. and two 45 kw.). Tenders will only be considered for the whole of the work covered by each specification, and not for any part thereof. Copies of the specifications, with the conditions of contract, &c., can be obtained from H. Ward, clerk, The Council House, Handsworth, near Birmingham, on payment of £3 3s. The specifications, conditions of contract and drawings, can be seen at (but not obtained from) the offices of the consulting engineers, Kennedy & Jenkin, 17, Victoria Street, Westminster, London, S.W. Tenders, on the prescribed form, in sealed envelopes, and endorsed on the outside "Electric Light and Power Supply Tender, Contract No. —," must be delivered to H. Ward, at the Council House, before noon on Dec. 15. Fair wages clause.

ROADS AND CARTAGE.

Dec. 13. Aberdeen.—*Macadamising (a) lane* from Menzies Road to Walker Road; (b) lane from Walker Road to Grampian Road; and (c) Sunny bank Place, for the Town Council. Plans may be seen and specification, schedule of quantities, and form of tender obtained, on application to W. Dyack, burgh surveyor, Burgh Surveyor's Office, Town House, Aberdeen, with whom sealed tenders, properly endorsed, must be lodged before 12 noon on Dec. 13.

Dec. 18. London, W.—*Making-up Stanway Gardens* and Emanuel Avenue, for Acton U.D.C. Plans and specifications can be seen, and bills of quantities obtained, at 57, High Street, Acton, during office hours. Tenders to be delivered at the Council Offices, 242, High Street, Acton, not later than 3 p.m. on Dec. 18.

Dec. 18. London, N.W.—*Execution of certain road-making* and paving works in the following roads:—Temple Road, Langton Road, and Oaklands Passage and Mews, Cricklewood; Denzil Road, Neasden; Chambers Lane, Willesden Green. Plans and specifications may be seen and all further particulars obtained upon application to O. Robson, M.Inst.C.E., engineer to the Council, Public Offices, Dyne Road, Kilburn, N.W. The tenders, upon printed forms, and endorsed "Private Streets," to be delivered at the offices of the Council not later than 4 p.m. on Dec. 18. A £10 note to be deposited with each tender.

Dec. 29. Horsham.—*Supply of*—(1) Picked surface flints and pit flints, delivered on the main roads; (2) broken quartzite, granite, or other stone to Shoreham Harbours and to railway stations; (3) tarred slag, or other tar macadam, to railway stations; (4) cartage from railway stations, wharves, and stone pits to main roads; and team labour per day, for the Roads and Bridges Committee, for the year ending March 31, 1908. Forms of tender may be obtained on application to W. McIntosh, county surveyor, County Surveyor's Office, 22, Worthing Road, Horsham, and applicants are requested to state which form of tender they require. Sealed tenders, endorsed "Tender for Materials" or "Tenders for Cartage," together with samples, to be delivered to the County Surveyor on or before Dec. 29.

Jan. 1. Reading.—*Supply of broken road materials*, setts, channels, and kerbs for the twelve months ending March 31, 1908, for the Berkshire C.C., delivered at railway stations and wharves in the county. On the receipt of a stamped addressed envelope, forms of tender, list of stations and wharves, and full particulars will be forwarded by J. F. Hawkins, county surveyor, Bank Chambers, Cross Street, Reading. Tenders, endorsed "Tender for Materials," to be sent to him by Jan. 1, 1907. The contractor will be required, if his tender be accepted, to enter into a contract to be prepared by the County Solicitor, such contract, if though desirable by the Solicitor, to provide for two sureties. A specimen form of contract may be seen at the office of the Clerk of the C.C., 28, The Forbury, Reading.

Jan. 12. Chelmsford.—*Laying about 140 sq. yds.* of footpaths with concrete flags, excavating, laying a concrete foundation, and paving with wood blocks an area of about 800 sq. yds. in New Street, Chelmsford. Plan and specification may be seen of C. Brown, A.M.I.C.E., borough surveyor, 16, London Road, Chelmsford. Tenders, endorsed "Tenders for Wod Paving," must be delivered at the office of T. Dixon, town clerk, Town Clerk's Office, 16, London Road, Chelmsford, not later than Jan. 12.

SANITARY.

Dec. 14. Bushbury.—*Supply and laying of about 1,190yds.* of 12-in., 2,030yds. of 9-in., and 650yds. of 6-in. stoneware pipe sewers, together with the construction of all manholes, lampholes, and flushing chambers required, also for the construction of sewage-disposal works, including detritus and septic tanks and three circular filters and appurtenances, for the Bushbury (Oxley District) sewerage and sewage disposal. Plans may be seen, and specifications, bills of quantities, and form of tender may be obtained, on application to the Engineer to the Council, H. M. Whitehead, Engineer's Office, Penkridge, Stafford, upon payment of £5 Bank of England note. Sealed tenders, on the forms supplied, endorsed "Bushbury Sewerage," must be delivered to A. W. Carver, clerk to the Council, Union Offices, Cannock, not later than 10 on Dec. 14.

Dec. 17. Bristol.—*Supply of lead pipe, glass*, and plumbers' sundries, during the three months ending March 31, for the Sanitary and Improvement Committee. Specification and form of tender may be obtained at the offices of T. H. Yabbicom, city engineer, 63, Queen Square, Bristol, on payment of 10s. Tenders must be sent, in the envelopes provided, to 63, Queen Square, not later than 1 p.m. on Dec. 17.

Dec. 17. London, N.W.—*Storm-water drainage works*, Edgware Road, comprising the following, or thereabouts:—95yds. linl. 24-in. pipes, 355yds. linl. 21-in. pipes, 1,115yds. linl. 18-in. pipes, 1,500yds. linl. 12-in. pipes, together with about 33 No. brick inspection chambers and 110 No. gullies complete. Also for certain kerbing, channelling, and stone paving works in the Edgware Road, West Hendon, all within the Urban District of Hendon. The drawings and specification may be seen, and form of tender obtained, of S. S. Grimley, engineer and surveyor, at the Council Offices, The Burroughs, Hendon, N.W., on deposit of £10. Sealed tenders, endorsed "Edgware Road Storm-Water Drain" and "Paving Works," addressed to the Chairman of the Council, to be sent to H. Humphris, clerk to the Council, Council Offices, The Burroughs, Hendon, N.W., not later than 5 p.m. on Dec. 17.

Dec. 19. Herne Bay.—*Construction of about 3¼ miles of brick and concrete* and pipe sewers, with all the necessary manholes, ventilators, and flushing arrangements, the construction of a pumping station, cottage, and buildings, and the provision of pumping machinery, for the U.D.C. Plans and specification of the works may be seen and the form of tender obtained at the office of B. Latham, M.Inst.C.E., Parliament Mansions, Victoria Street, Westminster, the engineer for the works, or at the office of F. W. J. Palmer, the surveyor to the Council, at his office at Herne Bay. The quantities of the several works have been taken out by C. E. Bruges, A.M.I.C.E., 1, Victoria Street, Westminster, and may be had on application either to the Engineer or Surveyor on deposit of £10. Sealed tenders, on the form supplied attached to the quantities, endorsed "Tender for Sewerage Works," are to be delivered to J. Jubb, clerk to the U.D.C., at Herne Bay, on or before noon on Dec. 19.

Dec. 19. Ware.—*Providing and laying* about 150yds. of 24-in. concrete tube storm-water drain and sundry other works in Star Street, Ware, for the U.D.C. The drawings and specification, with bill of quantities and form of contract, can be seen at the Office of the Council's Surveyor, H. F. Hill, New Road, Ware, between 10 a.m. and 4 p.m., and copies of the specification and forms of tender can be obtained on payment of £1 1s. Sealed tenders, endorsed "Star Street Drainage," are to be delivered to G. H. Gisby, clerk to the Council, Council Offices, Ware, not later than Dec. 19.

Dec. 20. London, S.E.—*Construction of an underground convenience* at Brockwell Park. Drawings can be seen and specification, bill of quantities, and form of tender obtained of H. Edwards, C.E., borough engineer, 346, Kennington Road, S.E., between 10 a.m. and 12 noon, and 2 p.m. and 4 p.m. (Saturdays excepted), on payment of £1 1s. Tenders, duly made on the prescribed form, must be delivered at the Town Hall, Kennington Green, S.E., not later than 12 noon on Dec. 20.

Dec. 21. Sedgefield.—*Execution of a scheme of main sewerage* and sewage disposal for Bishop Middleham, for the Sedgefield R.D.C. The proposed works in this contract comprise the furnishing and laying of about 2,200yds. of 12, 9, 8, 7, and 6-in. fireclay and cast-iron pipe sewers with Gaskin and cement joints, with manhole and lamphole shafts, storm overflow and screening chambers, bacterial tanks and filters, fencing, cartroad, &c. Contractors desirous of tendering are requested to send their names and addresses. not Tyne, accompanied by a cheque for £3. after which engineers, 3, St. Nicholas Buildings, Newcastle-on-Tyne, accompanied by a cheque for £3, after which ful partilculars and quantities will be forwarded. The engineers will arrange in due course to locally meet the intending contractors and go over the route of the said works and explain plans and specification. Sealed tenders, endorsed "Tender for Bishop Middleham Sewerage," must be sent to J. W. Lodge, clerk, Union Offices, Sedgefield, Ferryhill, not later than 10 a.m. on Dec. 21.

Dec. 21. Valetta.—*Supply of stoneware pipes and specials.* Sealed tenders will be received at the office of the Receiver-General and Director of Contracts, Valetta, up to 11 a.m. on Dec. 21. Tenders are to be accompanied with a deposit of £50, to be made in the office of the Crown Agents by tenderers residing in Great Britain not having a representativeg in Malta, and in the office of the Receiver-General by local tenderers. Contract fees to be paid by the contractor. Particulars, specification, &c., may be obtained on application to W. Casolani, Receiver-General and Director of Contracts, or to the Crown Agents for the Colonies, Whitehall Gandens, London.

Jan. 2. Epping.—*Construction of sewage disposal works* and the laying of about 2,500 yds. lineal of pipe sewers, with manholes and contingent works in the parish of Chigwell, for the Epping R.D.C. Drawings can be seen, and further particulars and bills of quantities obtained, at the office of H. Tooley, A.R.I.B.A., Buckhurst Hill, upon the deposit of £10. Applications for bills of quantities must be made before Dec. 19. Tenders to be on the forms supplied, and sent in the envelopes provided, to R. D. Trotter, clerk, Epping, Essex, on or before 6 p.m. on Jan. 2.

Jan. 7. Stourport.—*Provision, laying and jointing* of cast-iron and stoneware pipe sewers, together with manholes, lampholes and flushing chambers, the construction of task sewer, engine-house, liquefying tanks, distributing carriers, effluent drains, and other incidental works, in accordance with the drawings and specification prepared by the engineers. Drawings and specification may be seen and bills of quantities obtained at the offices of Wilcox & Raikes, engineers, 63, Temple Row, Birmingham, on payment of a deposit of £5 5s. Sealed tenders, in the envelopes supplied, endorsed "Stourport Sewerage—Contract No. 1," to be delivered to C. H. Watson, clerk to the Council, Stourport, not later than 12 o'clock noon on Jan. 7.

Jan. 30. Weaste.—*New sewage pumps* to two large pumping engines at the Salford Sewage Works, Weaste. Drawings and specifiations may be obtained from the Borough Engineer, Town Hall, Salford, on payment of £1. Tenders, endorsed "Sewage Pumps," and addressed to "The Chairman of the Rivers Committee, Town Hall, Salford," must be delivered to L. C. Evans, town clerk, Town Hall, Salford, not later than 12 noon on Jan. 30.

MISCELLANEOUS.

Dec. 15. Longton.—*Supply for twelve months ending Dec. 31, 1907, of the following:*—Broken granite and granite setts, Macclesfield setts, stone kerbs, cast-iron work, ironmongery, lime, Portland cement, blue paving bricks, earthenware pipes, wheelwright's work. Specifications and forms of tender may be had on application to J. W. Wardle, Assoc.M.Inst.C.E., borough surveyor, Court House, Longton, Staffordshire. Tenders under seal, endorsed "Tender for Granite, &c.," as the case may be, are to be left with him on or before Dec. 15.

TOO LATE FOR CLASSIFICATION.

Dec. 13. Exeter.—*Certain works* at various school premises for the Exeter Education Authority. Particulars can be obtained on application to J. Jerman, F.R.I.B.A., architect, 1, Bedford Circus, Exeter. Tenders must be delivered by 10 a.m. on Dec. 13.

Dec. 14. London, S.E.—*Enlargement of the sorting office* at Lewisham, S.E. Drawings, specification, and a copy of the conditions and form of contract may be seen on application to J. Wager, H.M. Office of Works. Bills of quantities and forms of tender may be obtained of the Secretary, H.M. Office of Works on payment of £1 1s. Tenders must be delivered before 12 noon on Dec. 14, addressed to the Secretary, H.M. Office of Works, &c., Storey's Gate, London, S.W., and endorsed "Tender for Lewisham Sorting Office En-

Dec. 17. Hedon.—*Additions and alterations to* the Council School, Hedon. Plans and specifications may be seen, and forms of tender and copies and quantities obtained, on application to the Building Surveyor, County Hall, Beverley, upon depositing £1 1s. A copy of the plans and specification will be deposited at the Council School, Hedon, after the above date for the convenience of persons tendering. Tenders endorsed "Hedon Council School Extension" must reach J. Bickersteth, clerk to the East Riding Education Committee, County Hall, Beverley, on or before 10 a.m. on Dec. 17.

Dec. 17. Leeds.—*Cleaning down, painting, &c.*, at the Union Street, Holbeck Lane, and Kirkstall Road Baths. Forms of tender, specifications, and all particulars may be obtained, and copies of the documents forming the contracts may be inspected, at the City Engineer's Office on payment of a deposit of £1 1s. Tenders, properly endorsed, should be received at the Town Clerk's Office, not later than 10 a.m. on Dec. 17.

Dec. 17. Flemington.—*Construction of a goods yard* and relative works at Flemington, Motherwell, for the Directors of the Caledonian Railway Co. Drawings may be seen at the office of the Company's Engineer, Buchanan Street Station, Glasgow, where copies of the specification and schedule may be obtained on payment of £2 2s. An asistant engineer will attend at Flemington Station on Thursday, Dec. 6, at 11 a.m., to accompany contractors over and point out the line of the works. Sealed tenders, endorsed "Tender for Flemington Goods Yard," to be lodged with J. Blackburn, secretary, Caledonian Railway Company's Offices, 302, Buchanan Street, Glasgow, on or before Dec. 17.

Dec. 18. Durham.—*Additions to Croxdale Council School.* Plans, specifications, and conditions of contract may be seen of W. Rushworth, F.R.I.B.A., architect, County Education Offices, Shire Hall, Durham. Quantities may be obtained on application to the Architect, to whom sealed endorsed tenders must be delivered not later than Dec. 18.

Dec. 18. Crewe.—*Erection of new offices* and stores at the Electric Light Works. Persons desirous of tendering may obtain copy of quantities and conditions of contract on application to G. Eaton-Shore, borough surveyor, Municipal Offices, Earle Street, Crewe. The drawings may also be seen at his office. A deposit of £1 must accompany each application. Tenders to be sent to F. Cooke, town clerk, Municipal Offices, Crewe, not later than Dec. 18, at 10 a.m., endorsed "Tender for Offices and Stores."

Dec. 18. Cymmer.—*Private street improvement works* in Margam Street, Cymmer, for the Glyncorrwg U.D.C. Plans and specifications may be seen and bills of quantities obtained of W. P. Jones, surveyor, Council Offices, Cymmer, Port Talbot. Sealed tenders, marked "Tender for Street Works," and giving names of two sureties who will join in a bond for the due performance of the work, to be sent to Cuthbertson & Powell, clerks, Water Street, Neath, not later than Dec. 18.

Dec. 20. Killiney.—*An addition to the Victoria Hill Lodge*, Killiney, for the Killiney and Ballybrack U.D.C. Plan and specification may be seen of R. Cunningham, clerk of council, Council Offices, Killiney, during office hours. Marked tenders to be delivered to him before Dec. 20.

Dec. 29. Seacombe Ferry.—*Erection of new ferry workshops* at Seacombe Ferry, for the Wallasey U.D.C. Drawings and specifications may be seen, and form of tender and bill of quantities obtained, on application to W. H. Travers, engineer and surveyor, Public Offices, Egremont, Cheshire, on payment of a deposit of £1. Tenders in sealed envelopes, endorsed "New Workshops, Seacombe Ferry," to be addressed to H. W. Cook, clerk and solicitor, and forwarded through post for delivery at the Public Offices not later than Dec. 29.

Dec. 29. Carmarthen.—*Erection of new workhouse* at Carmarthen. Contractors desirous of tendering are requested to send in, not later than Dec. 8 next, their names and addresses to A. I. Jones, Board's architect, 2, Spilman Street, Carmarthen, together with a cheque for £2 2s. for bill of quantities. Sealed tenders (marked "New Workhouse") must be delivered to J. Saer, clerk to the Guardians, 7, Hall Street, Carmarthen, not later than Dec. 28. The tenders will be opened at the Board meeting on Dec. 29.

Jan. 1. Bray, Ireland.—*Supplying and erection of a high-tension* switchboard and instruments. Specification and form of tender may be obtained from W. J. U. Sowter, A.M.I.E.E., electrical engineer to the Council, on payment of a deposit of £2 2s. Tenders, sealed and endorsed "Switchgear," to be delivered to P. MacDonnell, clerk to the Council, Town Hall, Bray, Ireland, not later than 10 a.m. on Jan 1.

Jan. 1. Norwich.—*Supply of 160,000 red bricks*, equal in all respects to the sample which may be seen of A. E. Collins, M.Inst.C.E., city engineer, Guildhall, Norwich; delivered as, when, and in such quantities as are required, alongside the sewage works in progress between Old Lakenham and Hall Road, Norwich. Tenders, on the forms supplied, enclosed in envelopes sealed with sealing wax, endorsed "Bricks," and addressed to the Chairman of the Sewerage Committee, must be delivered to the City Engineer not later than 10 a.m. on Jan. 1.

Jan. 7. Scarborough.—*Construction of a group* of carriage sidings (about 4 miles in length) at Scarborough, on the west side of the Scarborough and Whitby Railway, for the Directors of the North-Eastern Railway. Plans may be seen, and specification, detailed quantities, and form of tender obtained, on personal application only, at the office of W. J. Cudworth, the Company's engineer, York. Sealed tenders, marked "Tender for Carriage Sidings, Scarborough," to be sent to the Secretary, at York, not later than noon on Jan. 7.

Jan. 17. London, S.E.—*Alterations and additions at the Infirmary*, Lower Road, Rotherhithe, S.E., according to plans and specification prepared by A. H. Newman, and quantities by W. T. Farthing & Son. Persons desirous of tendering for the works are required to send their names and addresses before Dec. 8 to E. P. Fenton, clerk to the Guardians, 283, Tooley Street, S.E., and to deposit with him a £50 Bank of England note. As soon after Dec. 8 as possible, forms of tender, bills of quantities, etc., and all other necessary information will be supplied to those persons whose names, addresses, and deposits have been supplied to the Clerk to the Guardians. The specification and plans of the works will then be open for inspection by such persons at the architect's offices, A. H. Newman, 31, Tooley Street, London Bridge, S.E., on production of the form of tender. Fair wages clause. Sealed tenders, endorsed "Tender for Alterations and Additions, Infirmary," must be delivered personally to E. P. **Fenton, clerk, 283,** Tooley Street, S.E., at 6 p.m. on Jan. 17, accompanied by the bills of quantities, &c., in a separate sealed envelope. The tenders will be opened and considered at 7 p.m. at the meeting of the Guardians on Jan. 17, at their Board Room, at which place, date, and time a responsible member of the firm tendering must be in attendance.

No date. Bagillt.—*Erection of an English Calvinistic Methodist Church* at Bagillt. Plans and specifications to be had from R. Jones, jun., architect, Holywell. Tenders to be sent to Rev. R. G. Jones, Rosscairn, Egremont, Cheshire.

No date. Swansea.—*Construction and erection of two swing bridges*, one over the entrance lock to the King's Dock, and the other over the communication passage with the Prince of Wales' Dock, together with hydraulic machinery for working the same, for the Swansea Harbour Trust. Specifications and plans and forms of, and instructions for, tender can be obtained on application to T. Strick, clerk, Harbour Offices, Swansea, on payment of £5 5s.

New London Buildings

At yesterday's meeting of the London County Council the Building Act Committee reported the following applications under the London Building Act, 1894, their recommendations as to consent or refusal being appended in *italics*:

Erection of a low brick wall, 3ft. high, in connection with Durning Mission Hall, Elsa Street, Limehouse, placed at an angle of 45 degrees across the angle formed in the passageway at the southern end of the widening and erected with the top of the wall raked back into the angle so that nothing can be deposited there. (*Consent.*)

Buildings abutting upon new street to lead from Southampton Row, Holborn, to Vernon Place, without requiring the portion of such new street as is to be on the site of Nos. 42 and 43a, Bloomsbury Square, to be formed and laid out, on the application of R. J. Worley, on behalf of the Selected London Properties Co. (*Consent.*)

Projecting shelter in front of the Blackfriars Station of the Metropolitan District Railway, Queen Victoria Street, City, in connection with the application of C. H. King, on behalf of the Metropolitan District Railway Co. (*Consent.*)

Retention of wood and glass screens at the sides of a projecting porch in front of No. 17, Queen's Gate, Kensington, on the application of J. W. Restler. (*Consent.*)

Three houses with one-storey shops in front, on the site of No. 63, Dartmouth Road, Forest Hill, and the erection of additional storeys over the existing shops at Nos. 55 and 55a, Dartmouth Road, on the application of E. C. Christmas. (*Consent.*)

Porch and two balconies in front of De Walden Court on the northern side of New Cavendish Street, St. Marylebone, on the application of D. Joseph, on behalf of F. Britton. (*Consent.*)

Iron and glass addition at the first floor level in front of the Alhambra Music Hall, Leicester Square, in connection with the application of W. M. Brutton, on behalf of the Alhambra Co. (*Consent.*)

Retention of a projecting sign in front of No. 121, Victoria Street, Westminster. (*Consent.*)

Porches in front of nine houses on the southern side of Putney Heath Lane, Wandsworth, eastward of Dungarvon Cottage, on the application of H. Bignold, on behalf of W. Tucker. (*Refusal.*)

Buildings at the rear of No. 58a, Earl's Court Road, Kensington, on the application of A. E. Parsons, on behalf of A. Roberts & Co., Ltd. (*Consent.*)

Iron and glass verandah in front of a motor garage at "The Logs," Well Road, Hampstead, on the application of W. A. Hudson, on behalf of F. C. Pusinelli. (*Consent.*)

Forecourt fence in front of No. 144a, Trafalgar Street, Walworth, also a projecting one-storey porch in front of the said building, on the application of R. J. Dickins, on behalf of the Right Hon. the Lord Llangattock. (*Consent.*)

Wood and iron building, of a temporary character, at the side of No. 39, Munster Road, Fulham, on the application of J. Cable, on behalf of J. H. Neave. (*Consent.*)

Retention of a photographic showcase in front of No. 194, New Kent Road, Newington, on the application of M. B. Olley. (*Consent.*)

Buildings on the northern side of Longford Street, to abut also upon the western side of Little Albany Street, with an irregular open space at the rear, on the application of P. B. Tubbs, on behalf of H. B. James. (*Consent.*)

Building No. 152, Lower Kennington Lane, with an irregular open space at the rear, also external iron staircases and balconies on the open space at the rear of Nos. 142 to 152 (even numbers only) inclusive, Lower Kennington Lane, on the application of C. Barker, on behalf of the Duchy of Cornwall. (*Consent.*)

Building on low-lying land situated at Baffin's Place, Bermondsey. (*Consent.*)

Six cottages on low-lying land situated at Nos. 74 to 79, George Row, Bermondsey, on behalf of Mrs. Portlock. (*Consent.*)

Partnerships

[*The date when the partnership was dissolved is given in parenthesis where known.*]

Watkins & Smith, builders, Glamorgan (Nov. 9).

Bedwell Bros., plumbers and decorators, Royston (Nov. 13). Debts by W. G. Bedwell.

Walker & Johnson, builders, Blackheath (Nov. 13).

Smith & Bailey Bros., builders, Sheffield (Nov. 14).

Martin & Hodges, timber dealers and merchants, London, E.C. (Nov. 17).

J. Lanwarn & Son, builders, Cheltenham (Sept. 29). Debts by A. J. Cook, who continues.

Heron Bros., plumbers and gasfitters, Durham (Nov. 17). Debts by H. Heron, who continues in his own name.

Scott & Jeffray, joiners and builders, Menston (Aug. 18). Debts by R. M. Jeffray, who continues in his own name.

Boanson & Storm, painters and decorators, Sunderland (Nov. 16). Debts by E. Storm, who continues in his own name.

W. & J. Isherwood, painters and decorators, Blackburn (Nov. 6). Debts by W. Isherwood, who continues in his own name.

A Pawson & Co., ironmongers, builders, &c., Seaford (Nov. 19). Debts by A. W. H. Pawson, who continues as A. & G. Pawson.

Franklin & Newman, architects and surveyors, Rugby (Sept. 29. by death of J. T. Franklin). Debts by C. J. Newman, who continues.

New Companies.

Thomas Story & Co., Leeds, plumbers, glaziers, &c. Capital: £3,000.

Alverstoke Land & Brick Co., Star Chambers, Gosport. Capital: £8,000.

Donisthorpe Brick & Pipe Co., to acquire the business carried on by William Ball. Capital: £1,000.

Woden Brick Co., to acquire from R. E. W. Berrington a lease of certain pieces of land at Heath Town, near Wolverhampton, used as a brickfield, and to carry on the business of manufacturers of and dealers in bricks, &c. Capital: £2,000.

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Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, *Great New Street, Fetter Lane, E.C.*

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Abertillery (Mon.).—For the rebuilding of the Mitre Inn. Mr. R. S. Roberts, M.S.A., architect, Abercarn:—

D. Lewis, Llanhilleth	£1,660	0	0
N. Bagley, Abertillery	1,512	15	9
J. Jenkins, Ltd., Newport	1,277	0	0
R. Tudor,* Abertillery	1,165	0	0

*Accepted.

Barnwood (near Gloucester).—For the erection of a new block, to accommodate about 170 female patients, at the Second County Asylum, for the Committee of Visitors. Messrs. Giles, Gough and Trollope, architects, Craven Street, Charing Cross, London, W.C.:—

Simmonds, Gloucester	£27,341
King & Sons, Gloucester	27,000
Forse & Sons, Bristol	26,000
Rowbotham, Birmingham	22,854
Walters & Son, Bristol	22,782
Jones, Gloucester	22,400
Dallow & Sons, Birmingham	22,260
Whitehouse & Sons, Birmingham	22,233
Stephens, Bastow & Co., Bristol	22,166
Pye, Parkinson & Co., Swansea	21,649
Bloxham, Banbury	21,616
Saunders & Sons, Cirencester	21,595
Barnsley & Sons, Birmingham	21,388
Estcourt & Sons, Gloucester	21,175
Nicholls, Gloucester	21,060
Griffiths, Stourbridge	21,053
Lewis & Co., Hereford	20,990
Pethick Bros., London	20,944
King & Son, London	20,885
Pattinson & Sons, London	20,529
Hughes & Stirling, Bootle	20,340
Lowe & Sons, Burton-on-Trent	19,949
Coles, Plymouth	£19,847
Fish & Sons, Nottingham	19,546
Hopkins, Birmingham	19,500
Moss & Sons, Loughborough	19,450
Willcock & Co., Wolverhampton	19,450
Williams, Cardiff	19,369
Colborne, Swindon	19,199
Davies & Sons, Cardiff	19,045
Norman, Swindon	18,995
Davies, Cardiff	18,681
W. Bowers & Co.,* Hereford	18,520

*Accepted.

Pembrey (Carmarthenshire).—For the erection of a schoolroom, &c., and renovating Bethel C.M. Chapel:—

Brown, Thomas and John, Llanelly	£1,235	0	0
H. Thomas, Llanelly	1,200	13	0
J. Reynolds, Burry Port	1,199	12	0
T. Evans & Sons, Pwll, Llanelly	1,100	0	0
H. Maliphant,* Pembrey	1,095	0	0
B. Howell & Son, Llanelly	1,062	10	0

*Accepted.

Poole.—For the erection of additional buildings and alterations to the schools at Hamworthy, for the Poole Education Committee. Mr. H. F. J. Barnes, architect, Towngate Street, Poole:—

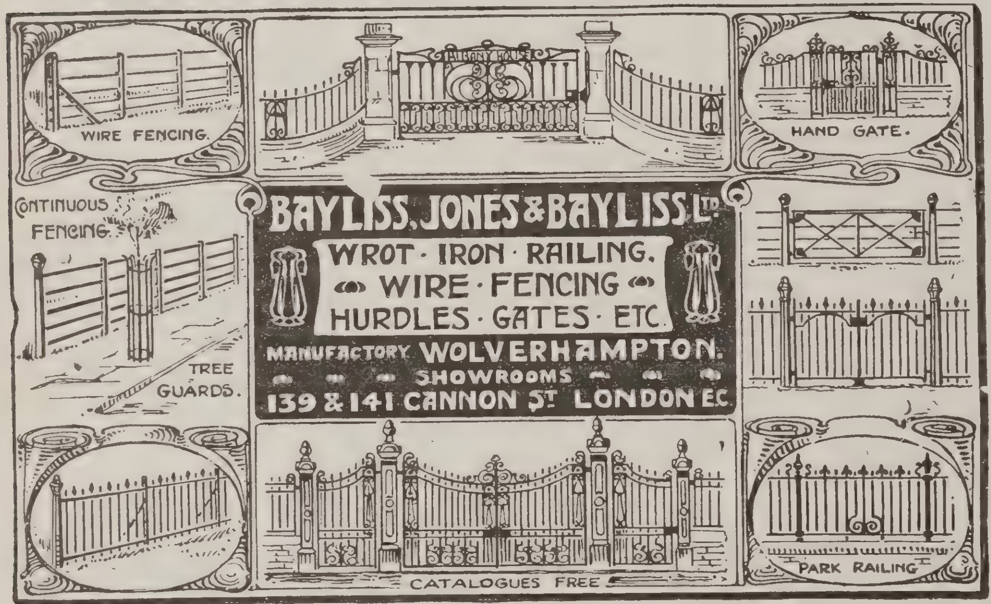
Baker & Pearcey, Parkstone	£2,196	0	0
A. & F. Wilson, Parkstone	2,110	10	0
Burt & Vick,* Poole	2,007	10	0

*Recommended for acceptance.

Woodhall Spa.—For the erection of a Wesleyan chapel. Messrs. J. Wills & Son, architects, Derby:—

Close & Son, Lincoln	£2,775	0	0
J. M. Harrison, Lincoln	2,705	0	0
Pettifer & Stainton, Woodhall	2,700	0	0
Halkes Bros., Lincoln	2,617	0	0
W. Wright & Son	2,585	0	0
C. Hensman, Horncastle	2,450	0	0
Turner & Son, Wainfleet	2,320	0	0
Miller & Son, Woodhall	2,300	0	0
Sherwin & Son, Boston	2,290	0	0
Mawer Bros., Louth	2,235	0	0
B. Crooks, Woodhall	2,220	17	10
Thompson & Son,* Louth	2,044	0	0

* Accepted.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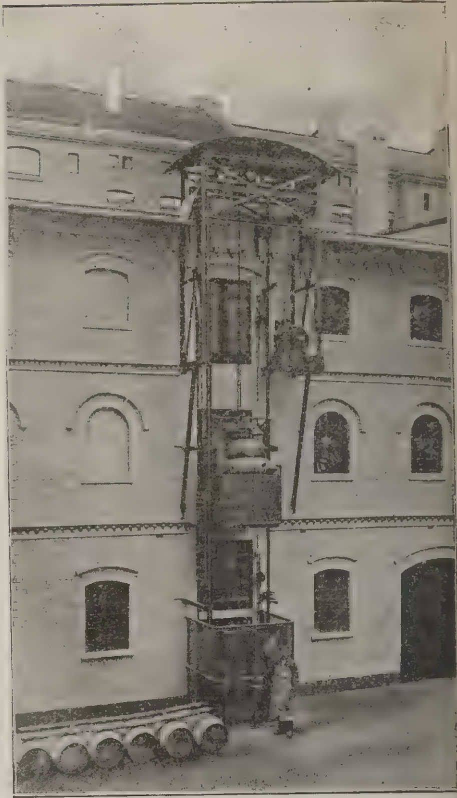

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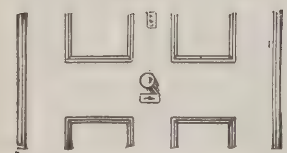

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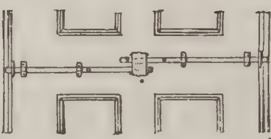

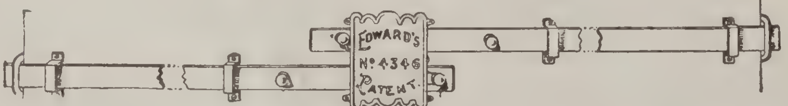

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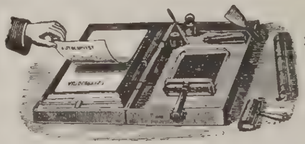

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Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—adjudication.]

DURING THE WEEK ending December 7th twenty-three failures in the building and timber trades in England and Wales were gazetted.

H. J. WILLIAMS, painter, Great Yarmouth. R.O., Dec. 1.

I. WATSON, joiner and builder, Colne. R.O., Nov. 30.

A. KEW, builder, near Basingstoke. R.O., Nov. 30.

W. COATES, plumber and painter, Longridge. R.O., Nov. 27.

J. ROBERTS, joiner and builder, Llanynys. R.O., Nov. 29.

J. LAWSON, builder, Teddington. P.E., Kingston C.C., Jan. 8, at 2.30.

MARRIOTT & SALTER, builders and contractors, Caterham Valley. Adj., Nov. 28.

WILLS, SOLA & CO., contractors, builders and decorators, Ealing. R.O., Nov. 27.

G. SWAN & SONS, builders and contractors, Kensington and Hammersmith. Adj., Nov. 30.

A. A. ADAMS, timber merchant, London, E.C. R.O., Nov. 26. P.E., Bankruptcy Court, Jan. 16, at 11.

D. EDWARDS, builder and contractor, Ynysddu. First meeting O.R.'s, Newport, Dec. 12, at 12. P.E., Town Hall, Newport, Jan. 8, at 11.

JOHN HADLEY, brick manufacturer, Tividale. Gross liabilities, £9,605; estimated assets, £3,425; net deficiency, £566.

R. WILLIAMS, painter and decorator. P.E., County Police Buildings, Blaenau, Festiniog, Dec. 11, at 1.

J. POWELL, builder and contractor, Pembroke. First meeting, Temperance Hall, Pembroke Dock, Dec. 7, at 1.15. P.E., same, at 12. R.O., Nov. 19.

F. C. IRONMONGER, timber merchant, Birmingham. First meeting, 191, Corporation Street, Birmingham, Dec. 12, at 11. P.E., Birmingham C.C., Jan. 16, at 2.30.

A. H. CLARKE, painter and decorator, Bristol. First meeting, O.R.'s, Bristol, Dec. 5, at 12.15. P.E., Guildhall, Bristol, Dec. 21, at 12. R.O., Nov. 23.

B. COLDWELL, painter and decorator, Huddersfield. First meeting, O.R.'s, Huddersfield, Dec. 6, at 3. P.E., Huddersfield C.C., Jan 21, at 2. R.O., Nov. 19.

G. SWANN & SONS, builders and contractors, Kensington and Hammersmith. First meeting. London Bankruptcy Court, Dec. 6, at 11. P.E., same, Jan. 15, at 11.30. RO., Nov. 19.

Coming Events.

Wednesday, December 12.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Mr. James L. Lawrence on "The Sanitary Considerations of Building," at 8 p.m.

INSTITUTION OF CIVIL ENGINEERS.—Students' Visit to the Wire-rope Works of Messrs. Bullivant & Co., Ltd., Millwall, E., at 2.30 p.m.

Thursday, December 13.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—Mr. J. B. Mitchell-Withers, A.R.I.B.A., on "Brickwork."

MANCHESTER SOCIETY OF ARCHITECTS.—Mr. T. Mawson on "The Unity of House and Garden," at 6.30 p.m.

Friday, December 14.

ARCHITECTURAL ASSOCIATION.—Mr. W. Howard Seth-Smith, F.R.I.B.A., on "The Architecture of Sicily," at 7.30 p.m.

ARCHITECTURAL ASSOCIATION (Camera and Cycling Club).—Mr. C. Wontner Smith on "Thaxted and Neighbourhood," at 7.30 p.m.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—Mr. Arnold Mitchell, F.R.I.B.A., on "The Study of Medieval Architecture."

GLASGOW TECHNICAL COLLEGE ARCHITECTURAL CRAFTSMEN'S SOCIETY.—Mr. Colin Sinclair on "The Philosophy of Art."

INSTITUTION OF CIVIL ENGINEERS.—(Students' Meeting.) Mr. A. Carmichael on "Mechanical Improvements in the Drainage of the Bedford Level," at 8 p.m.

INSTITUTION OF MECHANICAL ENGINEERS.—Mr. Henry Fowler, M.I.C.E., on "The Lighting of Railway Premises: Indoor and Outdoor," at 8 p.m.

Monday, December 17.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—Mr. W. J. Dibdin on "The Strength and Composition of Mortars," at 8 p.m.

Tuesday, December 18.

ARCHITECTURAL ASSOCIATION (Discussion Section).—Mr. L. Stanley Crosbie on "The Responsibilities of Style," at 7.30 p.m.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Mr. A. Hay Lamont, A.R.I.B.A., on "The Seventh International Congress of Architects," at 8 p.m.

Wednesday, December 19.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Mr. James L. Lawrence, M.R.San.I., on "The Sanitary Considerations of Building," at 8 p.m.

Thursday, December 20.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—Mr. Mouchel on "Reinforced Concrete," at 6 p.m.

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THE BUILDERS' JOURNAL
AND ARCHITECTURAL ENGINEER.
December 12, 1906.
CONTRACTORS' SUPPLEMENT (MONTHLY).
Vol. XXIV, No. 618. **6, Great New Street, London, E.C.**

MODERN PLUMBING.—I.

With the progress in sanitation plumbing has increased in importance to the contractor. The old order when the plumber was the contractor's employee has changed. The work has now largely got into the hands of specialist firms acting as sub-contractors. Decorative leadwork has been revived and requires the services of designers and craftsmen of ability, and is quite beyond the journeyman plumber. In the same way the complication of modern sanitation and the use of special fittings which have displaced the old inefficient types, such as the D-trap, requires the attention of experts in the planning of drainage schemes for buldings, the decision of fittings best suited to special purposes and conditions, and the supervision of workmen. Fittings are almost without exception constructed by the builder no longer. Plumbers are thus becoming less directly employed by general contractors. This applies, however, more especially to large buildings, and there is much work in the way of smaller buildings and repairs where special work has to be done by employees of the builder, and it is the purpose of the present article to call attention to modern sanitary fittings and plumbing details, the work of specialists and the latest practice generally.

The word plumbing is broadly interpreted to include such details as are fixed by the plumber in conjunction with lead work, but we are compelled to exclude work in other metals than lead, often carried out by the same craftsman as the plumbing, but which is primarily distinct from leadwork. The plumber, of course, originally obtained his name from being a worker only in lead, and we shall in the main conform to this view.

Leadwork is used in various ways, but they chiefly group under the main heading of conduction or carriage of liquids, which is divided into three sections :—

1.—The removal of rain water.

2.—The removal of contaminated liquids, such as waste water and sewage.

3.—Water supply.

In the provision of means for disposng of rain water by leadwork we are concerned with external plumbing, consisting for the most part of time-honoured details and methods that do not come within the scope of the present article, which we have confined to modern work. However, so far as some details are concerned there is a distinct modern treatment to be considered—namely, decoration. Considerable attention has been paid of recent years to the design of rain water heads, and cast-lead cisterns are being again favoured. We shall return to this aspect later and illustrate some examples of modern decorative leadwork. The services of plumbers are undoubtedly utilised to the greatest extent in connection with sanitary work and water supply. The latter is most appropriately dealt with first.

Water Supply.

In cities and towns it is desirable to have the water mains in streets charged with water at high pressure to supply hydrants in case of fire, but this high pressure is an objection in buildings as it necessitates heavy pipes, strong fittings, &c. To overcome this there are pressure reducers on the market. We illustrate in Fig. 1 Barton & West's patent, made by the Lambeth Brass and Iron Co., Ltd. This reducer is compact and simple. It is fixed between the main and the building, or just inside the building, and it will reduce the pressure to one-third, one-half, or any desired fraction of pressure in the main. In altering districts for constant supply the use of this reducer will very often render the provision of stouter pipes and stronger fittings unnecessary, and, consequently, save considerable outlay. Its construction is fairly obvious from the illustrations given.

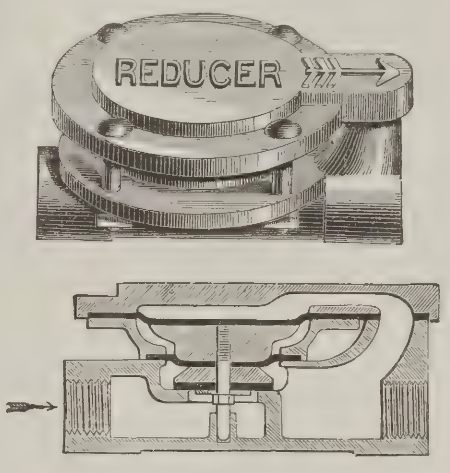

FIG. 1.

Taking the subject in the natural order, we come, after passing the main, to the storage of water in cisterns. The details connected with the cisterns have undergone little modification as a whole by the efforts of specialists. The subject seems to have, with the majority of sanitary engineers, reached its climax with the invention of the ball valve. The ball valve is rather a crude arrangement as ordinarily used. It is effective, of course, to a certain degree, but it is sensitive and easily becomes perished in course of time, necessitating repairs. The ball valve when it gets out of order lets the water run to waste. Frost is a danger that affects the cistern, perhaps, first of all, because it is generally placed in a position most liable to be so influenced and the ball valve become ineffective.

Fig. 2 shows an improved ball valve of the latest type, supplied by Messrs. F. J. Brazier & Son. This valve delivers twice as much water as the ordinary ball valve. It has a large outlet for the water after it has passed the seating of the valve, and it has no cup leathers or packing to get out of order.

As regards the main cistern itself, it is insanitary in construction. Being open to the air, as it very often is, it allows of the accumulation of filth in the way of dust, which contaminates the drinking water; and if, on the other hand, the cistern is effectually sealed against the entrance of dust, it is difficult to clean out, which it requires at regular intervals owing to various causes. It is impossible to effectually seal the cistern, because the drawing of water away from it creates a vacuum which has to be made up by the entrance of air. It is possible to provide that this air should be drawn from the open, but customarily this is taken from the apartment in which the cistern is placed, and as this is often in the roof without any light or proper ventilation, the air is here stagnant and often overheated and full of germs, for the air which is breathed by the occupants of a dwelling ascends to the top of a building and naturally collects in proximity to the cistern. The ordinary sanitary fittings adopted in buildings are very often ineffectual, and as a result the water becomes contaminated thereby, and the contamination, even if only slight, finds its way back into the cistern, because the latter is in direct communication with the whole of the service. Cisterns are unfortunately very seldom cleaned out by users because of the difficulty of access commonly provided, and also because of the inappreciation of the advisability of doing so and the disinclination to take any trouble.

An invention was shown at the Sanitary Institute Health Exhibition at Manchester in 1902, and was awarded the bronze medal, that offers a solution of many of the problems connected with domestic water supply. This is Grundy's patent cylindrical circulating household water supply system. The cistern in this is of cylindrical form. The main supplying the water to the cistern is disconnected by a valve which, while allowing the water to freely enter the cistern, prevents any possibility of return. So far, of course, no advantage is offered over the ball valve, except that a more efficient valve is interposed. The water drawn from the cistern for domestic purposes is again isolated from the cistern by non-return valves. In fact at every point where there is an opening, such as at every tap or valve, a non-return valve can be placed so as to afford an additional safeguard against contamination. When the water is drawn off from the cistern the air is drawn from the outside of the building through a valve of

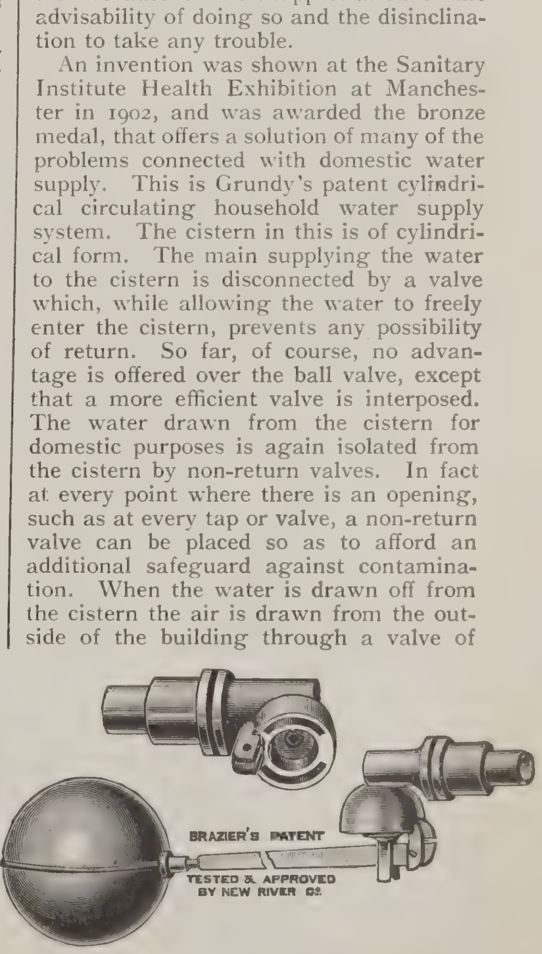
BRAZIER'S PATENT
TESTED & APPROVED BY NEW RIVER Co.

FIG. 2.

special construction which, while permitting air to escape freely when the cistern is filling and permitting air to enter freely when it is emptying, yet effectually prevents the escape of water by floating when the water reaches the level of this pipe and stopping the opening. Due to this the water enters from the main until the pressure is equal both in pipes and cistern. The float valve referred to is a distinctive feature of Grundy's system and needs special description. It consists of a cone shaped somewhat like a cartridge. Due to its shape this always floats with the point upwards, so that it cannot get displaced and always accurately stops the opening when lifted by the water. When it is not floating with the water, of course, it falls back so as to permit the air freely to pass.

In regard to the question of ordinary stop valves or water taps used on the water supply system, there are many patterns. These are generally described as plug valves and screw-down valves. The former comprises the simple plug cone with a hole which is placed across the passage-way or in a line with it by a half-turn, or the self-closing type in which the plug springs back to block the passage when let go. These both close so quickly that they strain the pipe by causing water hammer. A diaphragm valve is of the screw-down class. The most common class of screw-down valves consist of those in which the opening is gradually opened or closed by screwing down the plug. To this class belong the famous Kelvin metal tap shown in section in Fig. 3. This tap, of course, has the merit of not requiring washers or packing, the opening being effectually stopped by means of the metal surfaces grinding upon each other so as to preserve even contact. Another valve belonging to the screw-down class is Fig. 4, made by Messrs. Guest & Chrimes, of Rotherham.

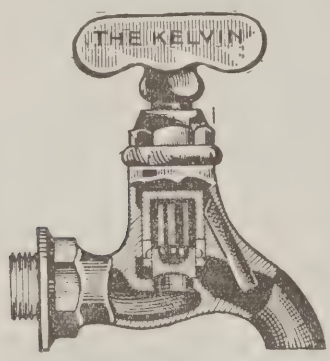

FIG. 3.

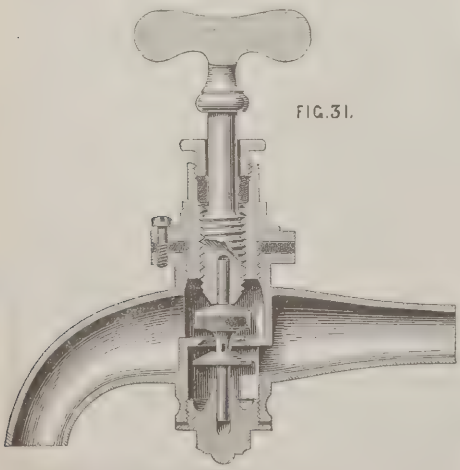

FIG. 4.

This cock admits of being immediately repaired without turning off the water. The stop is loose, as will be seen from the section. The jumper or loose stop is sometimes made so as to encase the packing or seating material with metal, this being done to protect the edges. The valve shown in Fig. 5 is useful for preventing burst pipes and obtaining water direct from the main. By its use a supply of water can always be obtained from the main pipe for dietetic purposes instead of from cisterns, which are very often in an unclean condition. Upon the commencement of frost the main valve should be screwed down so as to stop the water supply from the street going into the cistern. The inlet tap is then opened, thus allowing the house main pipe to empty. From the outlet tap water can be drawn for consumption. This combination stop valve is supplied by Messrs. F. J. Brazier & Son, of Seven Sisters Road, N.

In connection with the supply of water to lavatories and baths, there are other forms of valves in use. The "Noburn" improved public bath valve supplied by Messrs. J. Tylor & Sons, Ltd., is specially adapted for hospitals, asylums and other public institutions. It is so arranged that the cold valve must be opened first, as the key only turns in that direction. It then moves to the point marked on the dial "Ht." and "Cd." for tepid water and finally to full "Hot," and, on the key being reversed to "Shut" the valve closes without concussion. Another form of valve adopted for baths is the independent standard type used in connection with Roman baths. It stands at the foot of the bath, the spouts being made of suitable height and length to project over the roll rim. The waste is connected to the same standard. In connection with public institutions it is often felt to be undesirable for patients or occupants to turn the water on and off themselves, and so this is very often done by attendants from the outside of the room. A gear arrangement is fitted which extends through the wall or partition at the back of the bath and the taps are turned and the waste opened with a wheel from the outside.

Of sprays and douches there are many varieties. The valves in these cases are opened generally in the same way as ordinary water taps, but in connection with hospital fittings it is now thought, especially in operating rooms, to be undesirable to have contaminated hands placed on the fittings, and, consequently, valves are placed in positions to be opened by the feet or by the elbows of the user. Such an arrangement is shown in Fig. 6, which illustrates lavatory fittings for an operating room supplied by Messrs. Davis & Bennett, of Westminster.

Waste Water.

From the consideration of such water supply fittings we are naturally led to the disposal of waste water, and although this belongs to the section of sanitary fittings it is a distinct sub-division. The liquids to be disposed of are by no means so foul, and the waste water from domestic buildings is sometimes turned upon the gardens or fields and not into the sewer. One school of sanitary experts does not especially favour the great dilution of sewage that occurs in modern practice, but whether it will ever be decided to have a special separate system for the disposal of waste and flood water in towns is an open question. In any case waste water is sufficiently foul to require its careful trapping so as to prevent the ingress of bad air, or, indeed, its egress in positions where it would be offensive and dangerous to health.

The trap has received much attention from sanitary engineers and some experts have carried out experiments that have been particularly instructive. The majority of sanitary engineers unfortunately too seldom put their designs to practical tests before placing them on the market, and the result is that there have been, and are, many inefficient forms of traps which are advocated strongly and adopted by the unwary. Certain traps have been proved in practice to be inefficient, and these have died a natural death, but in the case of the new forms it is, of course, absurd to wait for practical demonstration by many years' use, and even then this would not provide us with the information which we desire—namely, their comparative efficiency. Among the old relics of the past, the D-trap is seldom or hardly ever seen nowadays except as a curiosity in a private museum.

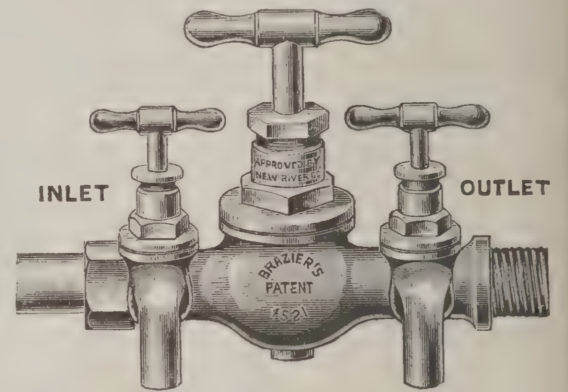

FIG. 5.

Some years ago Mr. S. Stevens Hellyer carried out a number of experiments in the flushing of traps of various forms, and he arrived at a form which gives excellent results. This he patented and called the "Anti-D" trap. The construction of this is illustrated in Fig. 7 and Fig. 8, the latter showing it in the form of a $1\frac{1}{4}$-in. trap with an enlarged mouth for sinks, baths, &c. This may, if desired, have a stopper at the bottom, as dotted in, for cleaning out. The space between the bottom of the trap and the under-side of the dip is purposely made much smaller

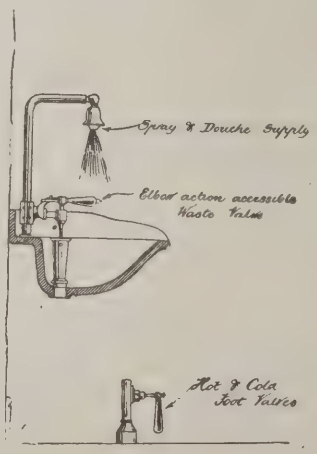

FIG. 6,

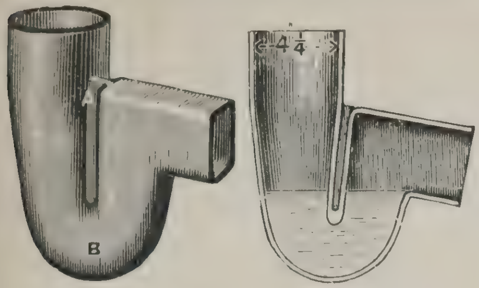

FIG. 7.

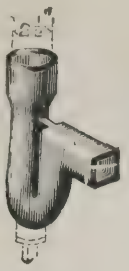

FIG. 8.

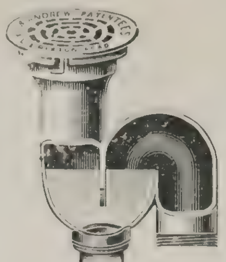

FIG .10.

than the rest of the trap to insure an entire change in its contents every time a flush of water is sent into it. The depth of the water seal is 1¾ins. These traps are of cast-lead. Mr. Hellyer also paid attention to the design of the ordinary P. and S. traps, and Messrs. Dent and Hellyer still continue to manufacture his special designs. These traps require to be vented on the top of the out-go in order to prevent syphonage. The "Anti-D" trap on the other hand resists the action of momentum and syphonage, which is liable to cause the trap to become unsealed. When, however, two or more of these traps are fixed on one stack of pipes, their branches should be ventilated to avoid syphonage.

The bath waste illustrated in Fig. 9, made by Messrs. Jackson, Elphick & Co., is in glass enamelled cast-iron. It is also made with a lead trap. The trap is made so as to sit above the floor level and it is claimed to be more easily fixed and cheaper than the ordinary brass trap. By the use of the loose flange, instead of cap and lining, the lead waste-pipe can be tafted to the trap, thus saving a plumber's joint. In fixing, the plumber has only to loosen the nuts under the flange of trap. The hanging bolts and nuts, being fixed in a screwed flange on the tail-piece, can be turned in any direction, and when placed in the position desired all that has to be done is to tighten the nuts, when the trap becomes perfectly rigid and water-tight.

It is very important that all traps should be self-cleansing. There are forms on the market which leave what might be called a back-water in the direct flow of the flush where the water remains stagnant and consequently is not changed by each flush and allows sediment to collect. This criticism is particularly applicable to many forms of gulley traps. Sometimes these have a cup-shaped receptacle placed in this back-water which can be easily drawn out of the trap and the sediment removed, but in our opinion all such forms are inadvisable of adoption, except in circumstances where large clogging objects are liable to be washed down the gulley, such as in stables. Though a trap may allow of being cleaned out easily, the public is incapable of appreciating the importance of this and leave the filth to collect and become offensive, resulting in danger to the health by the effluvia of this collected filth passing up the pipe into the house.

With lavatories, however, the grease from soapy water, &c., is the means of causing sediment to collect and occasionally obstructing the passage even in the best designed self-cleansing traps, and, consequently, it is advisable to have an opening provided which will permit of the trap being cleaned out, such as the small stopper referred to above at the base of a lavatory waste shown in Fig. 8 and also shown in Fig. 10, which latter is Tye & Andrew's patent trap, supplied by the Lambeth Brass & Iron Co., Ltd. It is made in cast-iron galvanised, with a brass grate. This grate is either secured with a clip (as seen in our illustration) or simply screwed in. It is advisable to remove the grease before it enters the drain and grease traps are adopted with the object of collecting the grease upon the surface of the water in the trap and prevent it from passing down the drain. It is no doubt well to remove the grease, and drains are often choked by the accumulation of grease, but the grease wants to be carefully attended to. We need not refer to any special forms as there is not much innovation with regard to them, while they are of secondary importance. They unfortunately in the nature of things come under the category of traps which interrupt the flush and often provide a stagnant back-water where sediment can collect.

Among the variants upon the plain self-cleansing trap are several forms of double traps and traps with check valves. The double trap is, of course, a good thing in its way, but it undoubtedly checks the force of the flush and renders the trap less self-cleansing by thus breaking the force of the discharge. Those double traps which provide the possibility of collection of sediment are of course undesirable. As regards the traps with check valves, these again have the danger of interrupting the flow and break the full force of discharge. The check valve consists of a ball which is made to seal over the passage-way to the waste pipe when this is out of use. This ball, therefore, interposes a second seal to prevent the ingress of contaminated gas, and so far is good.

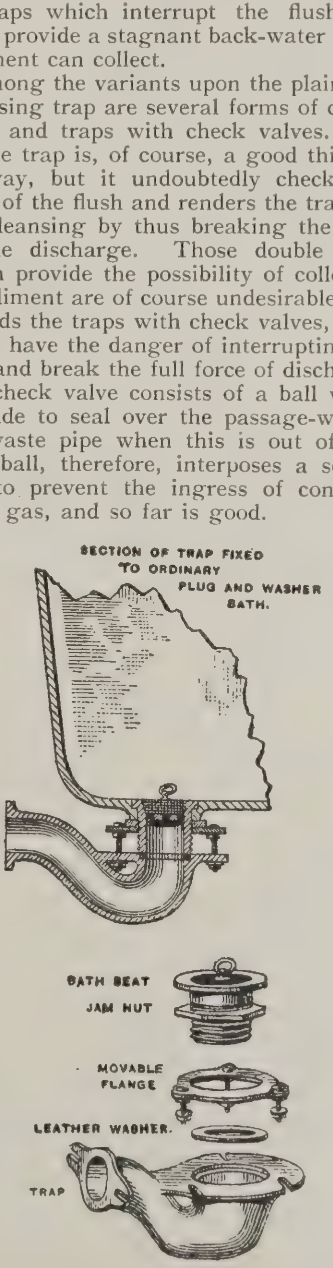

FIG. 9.

The chief point to be guarded against in connection with traps is syphonage. It is a matter of common knowledge that when a discharge of water takes place in a drain or waste connected with a long pipe, the water is liable to be drawn from a trap and break the seal. Where several traps are attached to one pipe, the falling water, of course, blows the air in front of it through the trap. To obviate both these things happening an anti-syphonage pipe is provided which communicates from the outer side of the trap to a separate air pipe vented into the open air.

There is another point in connection with traps which needs to be prevented—namely, the danger of back-flow. We often hear of houses which are flooded by the water rising in the sewer and running back into the houses and buildings in communication therewith by means of the intercepting trap. A back-flow valve should, therefore, be provided. This sometimes consists of a flapper over the opening, but a newer form which offers special advantages has been invented by Mr. D. Grundy. This is known as "The Only." We give in Fig. 11 a view showing the principle of this trap. The hollow float A permits the flow to pass readily, but any back-flow is prevented by this being forced into the opening E. The nose of this float owing to its peculiar shape is pushed up by the flow in one direction, and it cannot be displaced by a back-flow as it always returns to the correct position. An ordinary intercepting trap with this peculiar shape valve is also made. In this case the float is in a chamber with its flat base downwards. If the water from the sewer rises, this float is raised until it blocks the opening by which the sewage or waste water enters the sewer.

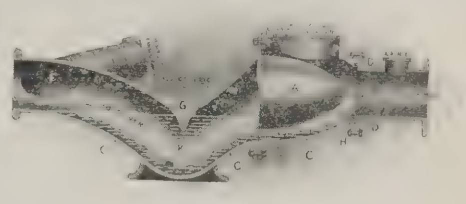

FIG. 11

(To be concluded.)

The Building Trade at Newcastle-on-Tyne—It is stated that many years have elapsed since the local building trade was so slack as it is now. For some considerable time there has been a dearth of the big contracts which keep the trade going. Hence a large proportion of those workmen who follow the building trades are without employment. So far as can be seen, there is no sign of a revival—even when the spring comes round. But the speculative builders are fairly busy.

The Scarborough Master Builders' Association held its annual meeting last month. The officers for the ensuing year were elected as follows:—President, Mr. R. H. Carr; vice-president, Mr. O. Smith; secretary and treasurer, Mr. F. Hardgrave; and auditor, Mr. W. Malton. Mr. A. W. Sinclair (senior vice-president of the Yorkshire Federation of Building Trade Employers) was again appointed to represent the Scarborough Association, and also as the representative to attend the meetings of the National Federation of Building Trade Employers of Great Britain and Ireland.

The Month's Trade

Reports by our Special Correspondents.

THE CLAYWORKING INDUSTRY.

Now the winter has come we can see that the small improvement manifested in the brick and tile trades for the past six months is not a temporary one, but is merely the first stage of a steady upward movement, for employment has even improved on the previous month, whereas in the natural course of things it ought to have fallen off. These trades badly needed it, perhaps more than any other branch of the building trade, and there is every prospect that next year if there is not exactly a boom trade will be good. The improvement in the general trade of this country was bound sooner or later to have its effect upon the building trades, and many branches have felt it already to a considerable extent, but the clayworking industry seemed to hold back. It is now going ahead, and its consequent progress may be all the more rapid because of the check. As we have before remarked, the improvement is most noticeable in those districts where the general trade is booming—*i.e.*, the cotton and engineering districts. Some agricultural counties have also done well and the clayworking trades are fairly employed there also. Employment in South Staffordshire has been fair during the past month and better than in the previous month and a year before, but in the Birmingham district and in Shropshire no improvement is yet noticeable. Employment has continued slack in the Peterborough district and at Nottingham. At Sheffield employment is reported as moderate. In South Wales and at Oldham the brick and tile trades have found employment good. At Ipswich, Sudbury and Chelmsford employment has been fair, and it has been reported as moderate in Devonshire.

THE STONE, GRANITE, MARBLE AND SLATE TRADES.

These trades seem to be well employed considering the season. The mild weather has no doubt helped matters to some extent, but trade is undoubtedly better, and next spring there will be many large contracts decided, while no doubt small orders will be more numerous. Employment is, of course, now slackening off for a few months.

Employment in the limestone quarries in Cumberland, Weardale and South Durham has continued good. It has been fair in the Buxton district and also in the Plymouth district.

The Rowsley sandstone quarries have been fairly employed. The quarries in the Sheffield district and at Barnsley have been moderately employed. At Normanton the quarries have been slack. At Gateshead employment has been moderate, and has remained bad in Forfarshire.

As regards the granite quarries, employment has continued fair in Aberdeen and good in North Wales; it has been slack in Leicestershire, Devonshire and Cornwall.

In regard to sett-making, employment has continued fair in Aberdeenshire and good at Glasgow, but at Airdrie it has declined, while it is bad at Edinburgh. In North Wales employment has been good, while it has been fair in the Clee Hill district. At Stoney Stanton (Leicestershire) employment has been dull.

Employment has continued fair in the Clee Hill road material quarries, and chert quarrymen in Derbyshire have been well employed, overtime being worked.

Messrs. Stewart & Co., of Aberdeen, have been negotiating for some time past with Messrs. Robert Thomson & Sons, Creetown, of Kirkcudbrightshire, with the view of purchasing their granite quarry and working plant. A settlement has now been arrived at, and a new 21 years' lease obtained of the quarry by the purchasers. The quarry has been bought with the probable view of forming a company to develop it on a more extensive scale. It is situated on the Fell Hill, overlooking Wigtown Bay, off the Solway Firth, so that the granite can be shipped to all parts of the west coast of England. It is, of course, not a new granite, being well known in many large towns. It has been worked for over 50 years. It is clearly distinguished from many other granites by its whiteness.

It may be interesting to note that Creetown is a large granite-producing district, there being several firms carrying on business there, including the Mersey Dock Board, the Scottish Granite Company and the Carsluith. The total quantity of granite produced in 1905 in Kirkcudbrightshire, which includes all parts of the county, was 63,882 tons. The Creetown quarries were first opened by the Mersey Dock Board some 80 years ago, and these quarries continue to be worked by that board chiefly for granite for their own use. These quarries produce all kinds of stone suitable for building, monumental and paving purposes.

There is no movement to report in the slate trade; it is simply sluggish. The larger quarries are on the whole badly employed. It is to be hoped that trade will take a turn for the better in the spring for the past year has been very slow. Employment during the past month has been reported as fair in Carnarvonshire, and quiet in Merionethshire and at Ballachulish in Argyllshire.

The returns for imports of stones, slabs and marble, rough, hewn and manufactured, for the month of November, 1906, as compared with the same month in 1904 and 1905, are as follows:—

Tons.			Value.		
1904.	1905.	1906.	1904.	1905.	1906.
112,497	103,923	90,436	£116,132	£106,366	£105,117

THE PORTLAND CEMENT TRADE

The position of the Portland cement trade has undergone but little change since we last wrote. Prices, if anything, are inclined to be somewhat firmer and the demand for the time of year is said to be satisfactory. Enquiries for new constructional works of some magnitude are fairly numerous, while general trade is distinctly better than it was a year ago. A good deal depends upon the question of stocks at works. It is well known that many manufacturers have practically empty warehouses at the present time, and if the export demand continues as good as it is just now, it appears certain that the aggregate stocks in the country next spring will be abnormally low. This is bound to result in advanced prices. The striking feature in the trade continues to be the activity in the foreign and colonial markets. This is not confined to any market, but is well spread all over the world; in fact, countries which for years past have been considered self-supporting in the matter of cement have been calling for outside supplies. It must be many a long year since Japan imported any foreign cement, but we hear of an order having been secured by a British manufacturer a few weeks ago for shipment to Yokohama. The Pacific Coast of North America, Brazil, Chili and the Argentine are taking substantially larger quantities than usual, while reports from the Continent speak of the enormously increased demand which now exists in all the leading countries. Prices which are already well in advance of those obtaining here are being rapidly advanced, and many of the Belgian and German artificial makers are fully sold well into next year. The activity in all the leading trades in this country is bound to make itself felt in the building and contracting trades before long, and in Lancashire and other districts signs are not wanting that this is already happening.

The returns of imports and exports of cement for building and engineering purposes for November, 1906, as compared with the same month in 1904 and 1905, are as follows:—

IMPORTS.

	1904.	1905.	1906.
Tons - -	24,644	18,778	11,940
Value - -	£35,137	23,478	16,384

EXPORTS.

	1904.	1905.	1906.
Tons - -	34,767	37,856	57,842
Value - -	£58,002	59,668	88,903

THE IRON AND STEEL TRADES.

There has been a steady improvement in the demand for both pig-iron and manufactured iron and steel during the past month and prices have continued to advance. To some extent the rise in price has been caused by an increase in the price of fuel, but American and German demands for export in pig-iron, to which we referred to last month, have been so heavy, continuing instead of falling off, that, combined with an increased home and ordinary export demands, the advance has been considerable. The stocks at the public stores are much reduced and makers have practically no stocks on hand. The increased value of pig-iron has reflected on the manufactured iron and steel market and raised prices. There is, however, an increased demand in this branch which alone would have sufficed to raise prices.

The settlement of labour troubles on the Clyde has also helped matters and the prospects are of the brightest. Makers are not reaping full advantage of the present advance, for they are fulfilling orders given some time ago at lower prices. They seem now to desire to reap advantage from the almost certain advance that will take place, and are disinclined to book orders too far in advance at present prices. The demand for pig-iron promises to keep makers hard put to meet it next year, while the rolling mills have orders booked well into next year. Great as has been the boom this year, next year promises to be still better.

As regards Lancashire, the demand for pig-iron has been so considerable that the local market is in an excited state. Prices have been helped upward by speculative buying. Finished iron has similarly advanced.

In South Staffordshire prices in both pig-iron and manufactured iron and steel have both risen—but it is thought that they will now remain practically stationary for a few weeks in consequence of stock-taking.

The North of England market is booming most of all. The stocks of pig-iron at Connal's stores at Middlesbrough are greatly decreased. It is stated that the quantity of pig-iron unsold in maker's hands has not been so small for 14 years. The exports from the Cleveland district in November established a record. The total was 144,741 tons. Of this Germany had 37,145 tons, the United States and Canada 33,040 tons, Italy 13,751 tons, Belgium 5,504 tons, and France 3,082 tons. Manufactured iron and steel prices are also advancing.

In Scotland pig-iron is in good demand and trade in manufactured iron and steel is very satisfactory.

As regards the foreign market, the United States and Germany seem unable to supply the home demand. At any rate, they are buying considerable pig-iron from England. In Belgium manufactured iron is in strong demand and prices in the home market are advancing. The low price of English joists has kept down the export price of Belgian joists, but the former having now advanced we may look for an advance in Belgian prices at any moment.

The returns for imports and exports in certain branches of manufactured iron and steel for the month of November, as compared with the same month in 1904 and 1905 are as follows:—

		Imports.			Exports.		
		1904.	1905.	1906.	1904.	1905.	1906.
Puddled Iron	tons	10,189	17,330	9,833	68,941	82,748	182,072
Wrought iron, in bars, angles, rods and sections		11,172	13,541	8,142	8,913	11,040	14,104
Rails		3,442	389	812	37,436	45,357	45,369
Steel:—Girders, beams, joists and pillars from Belgium		7,486	9,294	4,212	4,075	6,553	7,863
" " " " other countries		1,422	2,507	2,685			
Ingots, blooms, billets, slabs, sheet bars, tin plate bars, or similar partly manu actured		34,762	60,122	25,527	326	1,330	1,500
Bars, angles, rods and shapes or sections		12,825	4 680	1,551	10,868	14,298	24,175
Galvanized sheets (flat or corrugated)		—	—	—	36,194	38,113	43,931

OTHER METALS.

Copper is very strong, and as the production seems unable to keep pace with the demand prices may continue to advance. The mines are extending their facilities for manufacture, but it is unlikely that they will be so advanced as to be able to produce a greater quantity next year than this.

The tin market is in an intrinsically strong position and prices are maintained despite speculation.

Lead fell off in price in the middle of last month, but prices have advanced again.

THE IRONMONGERY TRADES.

Employment in the lock and latch trades at Wolverhampton has continued bad. With hollow-ware turners it has remained good, and with cast and light hollow-ware and iron fence and hurdle makers it has been fair. It has continued slack with hollow-ware stampers at Sheffield, and quiet at West Bromwich with hollow-ware makers.

Employment has continued quiet in the stove, grate, &c., trades at Rotherham. It has been fair at Falkirk with stove fitters and dull with moulders, and bad at Glasgow. It was fair at Leeds, Newcastle and Gateshead.

Employment has been fairly good with nut and bolt makers at Winlanton and Birmingham; and at Dudley and Darlaston it continued good. At Birmingham it has been fair with nail and rivet makers. At Blackheath it has been quiet with rivet makers and bad with nail makers.

Employment has continued good generally with wire makers and workers.

The return for imports and exports for November, 1906, as compared with the same month in 1904 and 1905, are as follows:—

	Tons. 1904.	1905.	1906.	Value. 1904.	1905.	1906.
Imports.						
Wire nails	3,143	4,085	3,193	£33,823	40,754	35,164
Nails (other than wire nails), screws and rivets	1,118	1,200	679	19,922	22,652	13,050
Bolts and nuts	474	431	316	7,705	7,950	5,723
Exports.						
Nails, screws and rivets	1,934	2,091	2,383	35,813	42,361	42,547
Bolts and nuts	1,590	1,545	2,336	24,878	26,472	36,958

THE WALLPAPER TRADE.

The wallpaper trade continues to show next to no movement. The Board of Trade returns for exports and imports for the eleven months of this year, ending November, show that the importation of paperhangings is about 20 per cent. greater than last year; the exports have improved less—namely, about 5 per cent. better than last year.

The following is the return of paperhangings for November issued by the Board of Trade:—

	1904.	1905.	1906.
Imports.			
Cwts.	—	5,479	5,771
Value	—	£13,293	15,172
Exports.			
Cwts.	3,841	5,697	5,728
Value	£11,893	14,834	13,503

The annual general meeting of the shareholders in the Wallpaper Manufacturers, Limited, was held at the end of last month. The report of the directors shows that, after payment of interest on debenture stock, interim dividend on preference shares, providing for depreciation and bad and doubtful debts, and including £128,385 2s. 1d. brought forward from last year, there remained on August 31st, available for appropriation £238,056. The difference as compared with £290,727 12s. 2d. last year is principally in consequence of £50,000 being already deducted from profits this year as a special appropriation for loss on closed branches, and the liquidation of Page, Arnold & Co., Limited. This is in addition to the usual depreciation of £30,000. The final dividend on the preference shares, amounting to £24,902 16s. 6d., was paid October 31st. A dividend at the rate of 8 per cent. per annum on the ordinary shares was declared. This amounts to £87,649 13s. 7d., and the balance, £125,503 9s. 11d., will be carried forward to next account. The actual profits on the year's trading are £228,908 8s. 2d., as compared with £243,227 4s. 4d. last year; the difference, the chairman stated, is accounted for by the low prices which have ruled, and an increase in the cost of paper. Part of the system adopted to reduce the cost of production has been to close certain branches, and concentrate their manufacturing at other branches. This has necessitated the storage of some machinery, the destruction of some, and the disposal of buildings at a lower price than that at which they were purchased as going concerns. The advantage will be shown in future years. The addition on capital expenditure is £62,340 7s. 6d., principally outlay on a new paper mill at Greenhithe. The mill will probably not be completed before a year hence. It may be that the opposition to the Soap Trust led the chairman to defend the Wallpaper Combine, for he said that the amalgamation of several firms in such a trade as theirs was necessary, in order to effect economies in the cost of production and distribution, and as this enabled them to quote low prices for goods the public participated in these economies, whilst they were also enabled to pay due regard to the interests of the merchants, as it was upon their success they wished to establish their own.

THE GLASS TRADE.

The glass trade is moderately good. With sheet glass makers and flatteners at St. Helens employment has continued good; with pressed glass makers on the Tyne and Wear it has remained moderate; with glass blowers in London it has been fairly good.

The returns for imports and exports of glass for the month of November, 1906, a compared with the same month in 1904 and 1905, are as follows:—

	Cwts. 1904.	1905.	1906.	Value. 1904.	1905.	1906.
Imports.						
Window and German Sheet, including shades and cylinders	69,706	143,782	123,212	£40,141	82,895	59,119
Plate	31,120	31,163	30,160	37,888	41,661	36,875
Exports.						
Plate	11,325	10,586	13,551	15,904	17,558	20,236

THE PAINT TRADES.

The paint trades continue fair. As regards materials, the returns for imports and exports for November, 1906, as compared with the same month in 1904 and 1905, are as follows:—

		Quantity. 1904.	1905.	1906.	Value. 1904.	1905.	1906.
Imports.							
White lead	Cwts.	25,382	32,516	23,628	£20,259	27,525	22,828
Zinc oxide		141,507	34,568	25,751	88,615	34,008	29,035
Other colours and pigments			126,341	143,758		76,220	98,660
Turpentine		51,858	32,150	63,003	95,360	74,516	144,040
Lac-dye, seedlac, shellac and sticklac		20,625	11,010	6,883	203,190	81,779	67,727
Linseed oil	Tons	241	1,491	2,074	4,276	25,227	41,536
Exports.							
White lead	Cwts.	30,875	33,772	27,894	28,970	34,143	32,717
Zinc oxide		126,464	5 858	7,364	152,307	6,656	7,904
Other colours and pigments			130,927	121,849		156,865	154,175
Linseed oil	Tons	3,368	2,481	2,204	59,333	48,492	48,947

THE TIMBER TRADE.

London Market in November.

The weakening of the London wood market continued through November, though on a lesser scale than in October. Messrs. Churchill & Sim report that the stock accumulating is too large for the market requirements; but it is a cheap stock, and, so far as a 6 per cent. Bank rate will allow, it is a stock worth holding. The importation from Russia, Finland and Norway has again been large. From Sweden it has been moderate, especially as regards prepared boards. The consumption continues miserable, the dock deliveries again being more than 2,000 standards below those of November last year; but the over-side deliveries are larger by 3,100 standards, bringing the total of the month's trading to the right side by about 1,000 standards. For next season a very large business has again been effected by Swedish, Russian and Finnish shippers with Continental markets at very high prices. These sales are no doubt for special specifications; but they are none the less for specifications coveted by British buyers, and by them the market for next year for battens and all small sizes at high prices is already assured. For deals the prospect seems to hinge on the White Sea stocks. If these shippers hold for more than they can get, as they are in the habit of doing, the Swedes will probably take the business at about the prices they are now asking. If on the other hand the Russians sell cheaply it would seem as if there were no intrinsic reason why, with the Cape market still out of the way, the Swedes would not have to follow them, and in that case they would hardly be able to sell out their deal stocks at more money than they have obtained this year. So far as this country is concerned very little business has so far been effected for next season, beyond a few sales of Finnish battens, which read cheaply in comparison with Swedish quotations, and practically the whole of the available firewood stocks, which have gone off at great prices.

Messrs. Denny, Mott & Dickson's report is as follows :—" Neither the weather nor business were cheerful during November. However, notwithstanding the grave handicap of tight and dear money, a quietly steady all-round trade was done, and probably the greatest handicap to the volume of timber business is the heavy advance demanded by the shippers for most descriptions of wood on the grounds of the magnitude of the consumption of timber in the United States and South America and the decrease in the forest supplies generally, but whilst these pleas are more or less sound, the position is not free from the taint of an artificial scarcity being created by rings or monopolies."

The abstract of dock stock, consumption, &c., for November, published by Messrs. Foy, Morgan & Co., is given in the table at the foot of this page.

Dock Stock.

The stock of wood in the public docks on November 30th was :—

	Pieces.
Foreign deals and ends - - - -	2,515,000
Do. battens - - - -	3,672,000
Pine deals and battens - - -	752,000
Spruce do do. - - -	1,042,000
Boards, rough - - - -	4,942,000
Do. prepared - - -	6,994,000

totalling 19,917,000 pieces, as against 17,623,000 in 1905, 19,838,000 in 1904, and 23,391,000 in 1903.

In other kinds the stock was as follows :—

Foreign wainscot logs - -	239 pieces.
Do. oak timber - -	899 loads.
Do. fir timber - -	3,521 do.
Do. Oregon pine, &c., spars and masts - -	3,809 do.
Colonial oak timber - -	530 do.
Do. birch timber and planks -	6,576 do.
Do. elm and ash timber -	948 do.
Do. yellow pine - -	1,136 do.
United States pitch-pine timber	18,083 do.
Do do. deals -	63,000 pieces.
East India teak - - -	7,230 loads.

Deliveries.

The deliveries have been—

	First eleven months. Pieces.	Nov. Pieces.
Foreign deals and ends -	2,874,000	268 000
Do. battens -	4,401,000	387,000
Pine deals and battens -	879,000	67,000
Spruce do. do. -	977,000	75,000
Boards, rough -	4,425,000	397,000
Do. prepared -	12,096,000	964,000
Total -	25,552,000	2,140,000

The deliveries direct from ship to craft have been—

	First eleven months. P.s.h.	Nov. P.s.h.
Deals and battens - -	119,427	10,615
Boards - - -	22,771	2,320
Total -	142,198	12,935

Soft Woods.

Swedish Deals, Battens and Boards.—The fresh arrivals from the Swedish ports have been on a very normal scale for deals and battens. Prices have, however, fallen lower than in October and battens have again fared rather the worse of the two. Of prepared boards the importation was a very small one for November, and in the absence of pressure to sell this has quite checked the tendency to any further weakness in spite of the poor consumption.

Norwegian Boards.—There was again a large arrival of prepared Norwegian boards during November. This has not, however, affected the market any further; they have gone off with ease and without any change from the quotations of last month.

Russian Deals and Battens.—There was also a large importation of Russian deals and battens into London during November. The consumption has been insufficient to carry off this supply except at a further reduction in the prices realisable, and quotations are now under those to which they fell in October.

Finnish Battens.—The supply of Finnish battens during the month was rather more than double that of November last year. Prices have continued to weaken, and as yet show no sign of recovery. There is a sharp rise ahead of them when the turn comes.

Prussian Timber.—There was no fresh arrival of fir timber during the month, which seems to have awakened this market to some of the elements of the situation, prices having risen quite sharply for such retail quantities as have been enquired for. The demand for oak timber has fallen away again in volume, but rates are still on the upward grade for such small quantities as are passing into consumption.

Canadian Timber.—There is no change to report in the pine deal market in London, prices remaining at about the same levels as before. The fresh arrivals have been almost negligeable. For spruce this market has dropped a point consequent on a very poor demand and rather freer arrivals from the St. Lawrence. The Lower Ports have only sent us a handful, but the c.i.f. quotations are hardly so strong. Birch cheered up quite appreciably during the month, but oak, elm, ash and yellow-pine were all neglected. There was no fresh arrival of pitch-pine timber or planks in London during November. The deliveries of sawn timber have kept going very well and the dock stock is shrinking again. Prices are up 3s. or 4s. a load and would go higher but that the very high quotations ahead show signs of weakening here and there for next year's shipments. For planks also prices are a turn or two better and this stock also decreased during the month.

Hard Woods.

Teak.—Messrs. Denny, Mott & Dickson report that the landings in the docks in London during November consisted of 592 loads of logs and 329 loads of planks and scantlings, or a total of 921 loads, as against 405 loads for the corresponding month of last year. The deliveries into consumption were 556 loads of logs and 382 loads of planks and scantlings—together 938 loads, as against 1,355 loads for November, 1905. The moderate landings of logs consisted chiefly of Java wood, so that the stock of Moulmein and Rangoon teak continues to dwindle, Consumers are increasingly discontented at the inadequacy of stocks to supply the quality and specifications which have been found by long experience most economical for the different classes of construction requiring teak, and substitutes for this wood are increasingly being specified. The shippers are still seeking to force up prices, and business is difficult all round, the suspicion that the short supply is aggravated by an artificial restriction by operators in India tending to increase the growing discontent on the part of the consumers.

Mahogany. — Consumption during November was steady and satisfactory looking to the very modest supplies. Honduras wood is in fair supply, but

Abstract of Stock, Consumption, &c., in London Docks, for November.

All Docks.	Deals (Fir).	Battens (Fir).	Pine.	Spruce.	Pitch-pine Deals.	Deals and Battens in Aggregate.	Rough Boards (All Countries).	Flooring.	Floated Timber.
	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Loads.
Public dock stock - - -	2,143,571	3,979,827	751,855	1,041,392	62,379	7,979,024	4,941,431	6,993,300	27,563
Monthly public dock consumption - - - -	227,337	341,672	74,806	79,775	11,027	824,617	410,853	976,482	3,723
Overside stock - - -	679,851	2,050,442	355,328	377,831	—	3,463,452	1,951,552	761,656	—
Overside consumption (estimated of dock) :—									
98 per cent. Sawn 63 ,, Planed }	222,724	423,039	73,310	78,179	—	797,252	402,636	615,184	—
Duration of supply at same rate of consumption - -	6.27 months.	7.06 months.	7.48 months.	8.99 months.	5.66 months.	7.06 months.	8.47 months.	4.87 months.	7.40 months.

Tobasco and African descriptions are inconveniently bare in stock. Prices have generally hardened. Messrs. C. Leary & Co., in their report on the mahogany market, say: "With a well-sustained demand and a shortage in supplies present and prospective, especially the latter, the position of our market is entirely in shippers' favour, and fresh imports of nearly every description can be recommended.

Builders' Notes.

Messrs. Patman & Fotheringham, Ltd., of Theobald's Road and Islington, have just completed the large mission hall and general offices for the Missions to Seamen at Tilbury; they are also nearing completing the rebuilding of the "Playhouse" (formerly the Avenue Theatre) for Mr. Cyril Maude, which was practically destroyed in the Charing Cross Station disaster.

The annual report of the Glasgow Master Wrights' Association, submitted at the general meeting last week, shows that the improvement in the building trade hoped for has not been realised. All branches of the building trade throughout Scotland have been specially dull. It was intimated that a Conciliation Board had been formed of an equal number of employers and operatives to adjust any differences that might arise.

The Huddersfield and District Master Builders' Association held a meeting last month for the purpose of hearing an address by the new secretary of the National Federation of Building Trades of Great Britain, Mr. White. As a result it was decided that a conference of members of the various allied trades, masons, plumbers, painters, joiners, etc., should be held at a convenient date in January next in order to discuss, and, if possible, arrange for, a combination of the various trades.

Messrs. Spencer Santo & Co., the well-known contractors, have declared an interim dividend at the rate of 6 per cent., as compared with 8 per cent. per annum this time last year. In the four years to December last, in respect of which 10 per cent. has been forthcoming, the interim dividends have been at the rate of 5, 7½, 5 and 8 per cent. respectively, so there is some justification for hoping for a maintenance of the old level when the complete results for the current twelvemonth come to hand.

Accidents in the Building Trade.—Mr. George Macfarlane, President of the National Federation of Building Trades Employers of Great Britain and Ireland, has been invited to become a member of the Departmental Committee on Accidents in the Building Trades, as a representative of the building industry for the northern portion of England and Scotland. Mr. Macfarlane is a native of Scotland, but he has been engaged in business as a builder in Manchester for the past forty years, and is familiar with the conditions of the building industry in the North. The methods of carrying on building operations vary considerably in the North from those prevalent in London and the South, and it is important that any regulations relating to the industry which may result from the report of the Departmental Committee should be drawn with a fuil knowledge of these varying conditions. Mr. W. Shepherd, of the London Master Builders' Association, is the builders' representative on the Committee for the South of England.

Bath Labour.—The men and masters in the Bath Building Trade have been working under a set of rules which provided for a 7½d. per hour wage, and these rules contained a provision for arbitration in the event of disputes arising under them. The masters desired an alteration of the rule governing winter hours. The secretary to the Bath Operatives' Joint Committee has presented to the master builders a complete new set of regulations governing all branches of the building trade in Bath and district. They embody new working rules, the shortening of hours, and increase of wages to 8d. per hour. The notice is a six months' one. The demands of the men may be formulated as follows:—Generally the effect of the proposed alteration in working hours is a reduction of half-an-hour per diem, or of three hours per week. The wages asked are, for masons, carpenters and joiners, bricklayers, plasterers, and plumbers, 8d. per hour; for labourers, 5½d. per hour, and scaffolders, 6d. per hour. Heretofore it has been generally understood that the wages paid in Bath are below the general standard. The allied trades mentioned above have not all received the same rate of pay, and a uniform scale is now proposed. The master builders will, no doubt, reply that if wages had not been lower in Bath than elsewhere employment would have been worse than it is for the operatives. The men suggest that two hours' notice be given or received upon dismissal or departure of any workman, failing which notice two hours' pay shall be forfeited or paid respectively, and that all wages due shall be paid on expiration of such notice. There is an obvious desire to discourage overtime with a view to increasing the number of men in employment by the suggestion of a rule that no overtime to be allowed except in cases of necessity, when such time shall be paid for extra. The men ask that no apprentice shall be taken on under 14 or over 16 years of age, and that no apprentice shall be bound for a less period that five years, or so that his indentures shall expire before the age of 21 years. Not more than one apprentice or improver to five journeymen of any branch to be allowed; sons of tradesmen to have preference to the trade of their father. Another rule proposes the formation of a Board of Conciliation, composed of four employers and four members of the trade affected, with two arbitrators where necessary, who may call in an umpire. Simultaneously the Bath branch of the National Amalgamated Society of Operative House Painters and Decorators are moving to a like effect. They require a minimum wage of 7d. an hour for competent workmen. They make conciliation proposals similar to those of the building trade operatives.

The Labour Market

Board ot Trade Returns for October.

Employment continued dull in October, and was worse than in September in nearly all branches. It was rather better on the whole than a year ago.

Returns received from firms employing 71,552 workpeople at the end of October show a decline in the number employed of 3,028, or 4·1 per cent., compared with a month ago. The table at top of next column summarises these returns.

District.	Number of Workpeople paid Wages on the last pay-day of the month.			
	Skilled Tradesmen.	Labourers.	Lads and Boys.	Total.
London	12,717	9,065	910	22,692
Northern Counties and Yorkshire	4,552	4,011	1,037	9,600
Lancashire and Cheshire	5,327	4,462	1,363	11,152
Midlands and Eastern Counties	4,415	4,136	628	9,179
S. & S.W. Counties and Wales	4,126	2,765	701	7,592
England and Wales	31,137	24,439	4,639	60,215
Scotland	4 308	2,857	1,097	8,262
Ireland	1,551	1,342	182	3,075
United Kingdom ...	36,996	28,638	5,918	71,552

The foregoing shows that the decline was general with very few exceptions. The decrease in the number of workpeople employed amounted to 2,022, or 5·2 per cent., in the case of skilled workmen, and to 974, or 3·3 per cent., in the case of labourers. In London the decrease amounted to 5·7 per cent. with skilled, and 3·8 with unskilled workmen.

The percentage of Trade Union carpenters and joiners unemployed at the end of October was 7·6, as compared with 5·9 in September, and 8·2 a year before. With plumbers 8·0 per cent. were unemployed, as compared with 7·8 per cent. in September, and 12·0 per cent. a year before. Employment with masons, plasterers and painters was worse than in September, but there was a slight improvement in the case of bricklayers. Compared with a year ago some improvement was reported by bricklayers and plasterers, and some decline by painters.

London.

From Trade Union returns relating to carpenters and joiners, it appears that the percentage unemployed at end of October was 9·0, as compared with 6·5 in September, and 8·8 a year before. With plumbers the percentage was 12·2, as compared with 9·2 in September, and 13·2 a year before. Employment in other branches was dull generally.

Northern Counties and Yorkshire.

Employment was dull, and somewhat worse than in September. It improved, however, with house joiners on the Wear, with whom it was good, and with painters at Hull and Hartlepool, with whom it was fair.

Lancashire and Cheshire.

Employment at Manchester was dull generally. At Oldham it was good with plumbers, plasterers and labourers, and was better than a year ago generally. With carpenters at Blackburn and Burnley it was fair; with plumbers at Bolton and Blackburn employment was good.

Midland and Eastern Counties.

Employment was dull generally. With painters it improved in the Leicester district, and it was good at Nottingham. Employment at Coventry was reported as fair.

Southern and South-Western Counties.

Employment continued dull generally.

Scotland.

Employment was dull generally, but good with slaters. With plasterers and plumbers it was rather better than in September. Employment was fair at Dundee. It was also fair with bricklayers in the West of Scotland.

Ireland.

At Belfast employment was slack generally, and worse than in September; with plasterers, plumbers and slaters at Dublin it was fair.

Current Rates of Wages in Large Centres.

Towns.	Masons.	Bricklayers.	Carpenters and Joiners.	Plasterers.	Slaters.	Plumbers.	Painters.	Labourers.
	d.	d.	d.	d.	d.	d.	d.	d.
Aberdeen	8	—	8	8	8	8	8	4½–5
Accrington	9	9	8½	9	7½	8½	—	5–5½
Ashton-under-Lyne	9½	10	9	10	8¼	9	8½	5½–6½
Barnsley	9	9	8½	9	8½	8	8	6½
Barrow-in-Furness	9	9	8¾	9	9	8¼	8¼	6–6½
Bath	7½	7½	7½	7½	7½	6½ 7½	6½	5–5½
Belfast	8½	8½	8½	8¾	8	8½	8½	19s.wk
Birkenhead	9½–10	9½	9½	9½	9	—	8½	5–6½
Birmingham	10–10¾	9½	9½	10	9	9½	8½	6½–7
Blackburn	9½	10	9	9	9	9	8	5½–6½
Blackpool	9¾	9½	8½	9½	8½	9	8½	5½–6
Bolton	9½	10	9½	10	9	9	8½	6–7
Bournemouth	8	8	8	8	8	8	7½	5½
Bradord	9	9	8½	8½	9	9	8	6–6½
Brighton	9	8	8	8	8	9	7	5½
Bristol	9	9	9	9	9	9	8½	6
Burnley	—	—	8½	—	—	—	—	—
Burton-on-Trent	8½	8½	8½	—	—	—	—	5¾–6
Bury	9½	10	9½	9	9	9	8½	5–6½
Cambridge	8½	8	8	8½	8	8½	6½	5–5½
Cardiff	9	9	9	9	9	9	8½	5½
Carlisle	8½	8½	8	8	9	8	8	5–5½
Chatham	8	9	8½	9	9	8½	7	5½
Cheltenham	8–8½	8	8	7¾	—	8	7½	5
Chester	9	9	8½	9	9	8½	7½	5–5¾
Coatbridge and Airdrie	9½	9½	9	9½	9	8½	9	6
Colchester	8	8	8	9	8	9	6 6½	5–5½
Cork	7⅔	7⅔	7⅔	7⅔	7⅔	8	8	3⅗
Coventry	9½	8¾	9	9	9	9	8	6
Crewe	8½	8	7	9	8	8	7	5–6
Darlington	9	9	8½	9	9½	8	7½	6
Darwen	9½	9½	9	9	9	9	8¼	6
Derby	9	9	8½	9	9	8½	7½	5½–6
Dublin	8–8½	8½	8–8½	8	8	8½	7½	4¼–4½
Dudley	8½	8	8	8½	8	8	7	5½
Dundee	8½–9	10	9	8½	8½	9	8½	5¼–5½
Eastbourne	8½	8	8	9	pce.	8	7½	5½
Edinburgh	8½	9½	9	—	—	9	—	—
Exeter	8	8	7½	7½	7½	7½	6½	5
Glasgow	—	9½	10	9½	9	9	9	5½–6
Gloucester	7½	8	8	7½	7½	8	7½	5
Greenock	9½	10	9	9½	9½	9	9	5½
Grimsby	—	9	8	9	pce.	—	7½	6–7
Halifax	9	9	8¼	8½	8½	8½	7½	6
Hartlepools	9½	9	9½	9½	—	—	—	6½–7½
Hastings and St. Leonards.	8½	8	8	8½	—	8	7	5½–6
Huddersfield	9	9	8½	8½	9	7½ 8	7½	6
Hull	9¼–9¾	9	9	9	9	9	8	6½–7
Ipswich	8	8	8	9	9	8	6½	5½
Keighley	8½	8½	8	7½	8½	7½	7½	6
Lancaster	9½	10	8½	9	9	8½	8½	5½–6
Leeds	9½	9½	9	9½	9	9	8	6½–7
Leicester	9	9	9	10	9	9	8	6½–7
Leigh	9½	9½	9½	9	8½	9	8	6–6½
Lincoln	8½	8	8	9	8	8	7	5–6
Liverpool	9½–10	9½	9½	9½	9½	9½	8½	5–6
London	10½	10½	10½	11	—	11	—	—
Londonderry	7	7	7	7	6½	7	7½	15s.wk.
Macclesfield	8	8	8	7¾	6½	7½	7½	5
Manchester	9½–10	10	9½	10	9	9½	8¾	5½–7
Merthyr Tydfil	8½	8½	8	8½	8½	8	7½	5½
Middlesbrough	9	9½	9¼	9½	9½	9	8	6¼–6¾
Newcastle	9½	9	9½	9½	9½	9	8½	6¼
Newport(Mon.)	8½	8½	8½	8½	8½	8½	7½	5½
Northampton	8½	8½	8½	8½	—	8½	7½ 8	5½
North Shields	9½	9½	9½	9½	9½	9	9	6¼–6½
Norwich	9	9	8½	9	9	8½	7½	5–6
Nottingham	9½	9	9	10	9	9	8½	6½
Oldham	9½	10	9½	9	8½	9	8½	5½–7
Oxford	8½	8	8	8	8	9	7	5½
Paisley	9	9½	9	9½	9	9½	9	6
Perth	8	10	8	8	8	8	7½	5½–6
Plymouth	8	8	8	8	8	8	7	5
Portsmouth	8½	8½	8	8½	pce.	7½	6½ 7	6
Preston	9½	10	9	8½	8½	8½	8½	5½–6
Rochdale	9½	10	9	9	8¼	9	8½	5½–6½
Rotherham	9½	9½	8½	8½	8	8½	7½	6
St. Helens	9	9	9	9	9	8½	8¼	5½–6
Scarborough	8½	8½	8	8½	30s. wk.	8	7½	6
Sheffield	9½	9½	9	9	9	9	7½	5½–6½
Southampton	7½	8	8	8	pce.	8	7	5
Southport	9	9	8¾	9	9	9	8½	6
South Shields	9½	9½	9½	9	9½	8¾	8½	6¼
Stockport	9½	9½	9	10	9	9	—	6–7
Stockton-on-Tees	9	9½	9¼	9½	9½	9	8	6¼–6½
Sunderland	9½	9½	9¼	9½	9½	37s. wk.	9	6¼
Swansea	8½	—	8½	8½	—	8½	7½	5½
Torquay	7	7	7½	7	7	7	7	4½–5
Wakefield	9	8½	8	8½	8	7½	7½	6
Walsall	9	8½	8½	8½	8½	8½	7¼	5¾–6½
Warrington	8¾	9¼	9¼	9½	8½	9¼	—	6–6½
WestBromwich	9½–10	9	8½	9	pce.	8½	7	6–6½
Wigan	9½	10	9	9	8½	9	8½	5½–7
Wlverhampton	9	9	9	8½	8½	9	7½	6–6½
Worcester	8½	8½	8½	8½	8½	8½	7	5½
Yarmouth	7½	7½	7½	A	7½	7½	6	4½

A. Done by bricklayer.

Current Market Prices.

FORGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	10	0	1	12	0
Clover, best...	per load	4	7	0	4	17	6
Hay, good	do.	4	0	0	4	5	0
Sainfoin mixture	do.	4	0	0	4	7	6
Straw...	do.	1	8	0	1	14	0

MISCELLANEOUS.

		£	s.	d.	£	s.	d.
Bricks Stocks, d/d to job	per 1,000	1	15	0		—	
Do. Flettons on rail ...	do.	1	5	0		—	
Do. Pressed Wire Cuts, d/d to job ...	do.	1	17	0		—	
Do. Blue brindled wire cuts	do.	1	2	0		—	
Do. do. wire cuts ...	do.	1	6	0		—	
Do. do. pressed facings	do.	1	17	6		—	
Coke Breeze, into carts at gasworks ...	per load	0	2	0		—	
Do. d/d to job	do.	0	4	0		—	
Sand	per yard	0	7	6		—	
Ballast	do.	0	6	6		—	
Granite Chippings ...	do.	0	10	6		—	
Do. do. ¼in. ...	do.	0	11	6		—	
Do. Broken, 1½in. ...	do.	0	15	6		—	
Do. do. 2in. ...	do.	0	15	0		—	
Do. do. 2½in. ...	do.	0	14	6		—	
Cement	per ton	1	12	0		—	
Lime	do.	1	4	0			
Glass, English Sheet, in crates of stock sizes, 15oz., 2nds	per sq. ft.	0	0	3½		—	
Do. do. do. do. 3rds.	do.	0	0	2½		—	
Do. do. do. 21oz., 2nds.	do.	0	0	5		—	
Do. do. do. do. 3rds	do.	0	0	3½		—	
Do. do. do. 26oz., 2nds	do.	0	0	6		—	
Do. do. do. do. 3rds	do.	0	0	4¼		—	
Do. do. do. 32oz., 2nds	do.	0	0	8		—	
Do. do. do do. 3rds	do.	0	0	6		—	
Do. English patent plain rolled plate in stock crates ⅛	do.	0	0	2		—	
Do. do. do. 3/16	do.	0	0	2¼		—	
Do. do. do. ¼	do.	0	0	2½		—	
Castor Oil, French ...	per cwt.	1	9	0		—	
Colza Oil, English ...	do.	1	13	6		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	15	0	2	17	0
Lead, white, ground, carbonate	per ton	16	0	0		—	
Do. red	do.	15	0	0	19	0	0
Linseed Oil, barrels ...	per cwt.	1	2	0		—	
Petroleum, American ...	per gal.	0	0	6⅛	0	0	6¼
Do. Russian ...	do.	0	0	5⅝	0	0	5⅞
Pitch	per barrel	0	12	0	0	13	0
Shellac, orange	per cwt.	10	14	0		—	
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Town	per cwt.	1	13	0		—	
Tar, Stockholm	per barrel	1	5	0		—	
Turpentine	per cwt.	2	9	3		—	

METALS.

		£	s.	d.	£	s.	d.
Standard Copper	per ton	103	0	0	104	0	0
Do. Strong sheets ...	do.	118	0	0	119	0	0
Lead, soft foreign	do.	19	10	0	19	12	6
Do. English	do.	19	10	0	19	12	6
Do. pipes...	do.	19	15	0	20	0	0
Do. sheets	do.	22	0	0	22	5	0
Galvanised Corrugated sheets	do.	13	15	0	14	0	0
Spelter G. M.	do	27	15	0	28	0	0
Angles, Scotland	do.	6	12	6	6	15	0
Bars, do.	do.	7	15	0	7	17	6
Marked bars, Staffs. ...	do.	8	12	6	8	15	0
Common bars, do. ...	do.	7	5	0	7	10	0
Angles, M'boro.	do.	6	12	6	6	15	0
Joists, M'boro	do.	6	5	0	6	7	6
Angles, Midlands	do.	6	10	0	6	12	6
Joists do.	do.	6	17	6	7	0	0
Girder plates, Midlands ...	do.	7	10	0	7	12	6
Angles, Foreign, c.i.f. Thames	do.	6	17	6	7	0	0
Tees do. do. do.	do.	7	0	0	7	2	6
Joists, do. do. do.	do.	6	5	0	6	7	6
Channels do. do. do.	do.	6	10	6	6	12	6
Plates do. do. do.	do.	7	5	0	7	7	6
Tin, Foreign	do.	195	15	0	196	0	0
Do. English ingots ...	do.	194	10	0	195	0	0
Zinc, sheets, Silesian, f.o.b.	do.	32	0	0	32	5	0
Do. do. V.M. do.	do.	32	5	0	32	10	0

TIMBER.

Soft Woods.

		£	s.	d.	£	s.	d.
Fir, Dantzic and Memel	per load	3	10	0	4	17	6
Pine, Quebec, Yellow ...	do.	3	12	6	6	10	0
Do. Pitch, American ...	do.	3	16	0	6	0	0
Laths, log, Dantzic	per cu. fath.	4	0	0		6—0	
Deals, Archangel, White, 1st, 3×9	per std.	12	0	0	12	5	0
Do. do. do. do. 3×8	do.	10	5	0		—	
Do. do. do. 2nd, 3×11	do.	11	10	0		—	
Do. do. do. do. 3×9	do.	9	15	0	10	5	0
Do. do. Yellow, 3rd, 3×9	do.	15	0	0		—	
Do. do. do. do 3×11	do.	8	10	0		—	
Do. do. do. 4th, 3×11	do.	7	10	0		—	
Do. do. do. do. 3×9	do.	8	5	0		—	
Do. do. Larch, unsorted, 4×9	do.	9	10	0		—	
Deals, Archangel. Larch, unsorted, 3×9	per std.	9	10	0		—	
Do. do. do. do. 3×7	do.	8	10	0		—	
Do. Blankaholm, White, 2nd, 3×9	do.	8	10	0		—	
Do. Fredrikshamn, Yellow, 1st & 2nd, 3×4½	do.	7	15	0		—	
Do. Fingermanholmen, Yellow, unsorted, 2½×7 ...	do.	7	0	0		—	
Do. Gothenburg, Yellow, 3×4	do.	4	10	0		—	
Do. Hudikswall, Yellow, unsorted, 2½×7	do.	8	0	0	8	5	0
Do. Kemi, Yellow, dry, 1st, 3×8	do.	15	0	0		—	
Do. Langrov, Yellow, 5th, 4×9	do.	8	15	0		—	
Do. Munksund, Yellow, unsorted, 3×9	do.	9	0	0		—	
Do. do. do. do. 3×7	do.	8	0	0		—	
Do. Montreal, Spruce, unsorted, 3×9	do.	9	5	0		—	
Do. Quebec, Spruce, 2nd, 3×9	do.	9	15	0		—	
Do. do. do. do. 3×7	do.	8	15	0		—	
Do. Räfsö, Yellow. 2nd, 3×9	do.	12	5	0		—	
Do. St. Petersburg, Yellow, 1st, 3×11	do.	10	0	0		—	
Do. do. do. do. 3×9	do.	12	0	0		—	
Do. do. do. 3rd, 3×11	do.	7	15	0		—	
Do. do. do. do. 3×9	do.	7	10	0		—	
Do. do. do. do. 3×7	do.	7	10	0		—	
Do. do. do. do. 2 ×7	do.	8	10	0		—	
Do. do. do. unsorted 3×8	do.	9	15	0		—	
Do. do. White, 3rd, 2½×7	do.	8	0	0		—	
Do. Skelleftea, Yellow, 1st, 3×11	do.	12	0	0		—	
Do. do. do. do. 3×9	do.	11	0	0		—	
Do. do. do. 1st & 2nd, 2½×7	do.	8	15	0		—	
Do. do. do. 2nd, 4×7	do.	9	5	0	9	10	0
Do. Torefors, Yellow, 5th, 3×9	do.	8	10	0		—	
Do. Trangsund, Yellow, 1st & 2nd, 2½×7	do.	9	10	0	9	15	0
Do. Wartsala, Yellow, 1st & 2nd, 2½×7	do.	9	5	0		—	
Battens, Archangel, Yellow, 1st, 2×8	do.	15	0	0		—	
Do. do. do. 2nd, 2×9	do.	15	0	0		—	
Do. do. Larch, unsorted, 1×7	do.	10	0	0	10	5	0
Do. do. do. do. 1×4	do.	8	10	0	8	15	0
Do. Fredrikshamn, Yellow, 1st & 2nd, 2×4	do.	8	10	0		—	
Do. Gothenburg, Yellow, 1st & 2nd, 2½×4	do,	4	15	0		—	
Do. Gamleby, White, unsorted, 2×9	do.	8	10	0		—	
Do. Kristinestad, Yellow, 1st & 2nd, 2×7	do.	8	15	0	9	0	0
Do. Mesane, Yellow, 1st, 1½×7	do.	14	10	0		—	
Do. do. do. 3rd, 1½×7	do.	9	10	0	9	15	0
Do. St. Petersburg, White, 3rd, 2½×6½	do.	7	15	0		—	
Do. do. do. do. 2×6	do.	7	5	0		—	
Do. do. do. do. 2×5	do.	7	10	0		—	
Do. do. do. do. 2×4	do.	8	10	0		—	
Do. do., Yellow, unsorted, 2×4	do.	9	5	0		—	
Do. Skelleftea, Yellow, 2nd, 2×8	do.	7	5	0		—	
Do. Skonvik, Yellow, 2nd, 1¼×9	do.	10	0	0		—	
Do. do. do. do. 1×9	do.	10	0	0		—	
Do. Umba, Yellow, 3rd, 2×9	do.	11	0	0		—	
Do. do. do. do. 1¼×7	do.	10	15	0		—	
Flooring Boards, Fredriksstad, Yellow, 3rd, 1×7	do.	0	9	9		—	
Do. do. do. unsorted, 1×6	do.	0	9	9		—	
Do. do. do. do. 1×5½	do.	0	9	0		—	
Do. do. do. do. 1×5	do.	0	8	9		—	
Do. Mon, Yellow, 2nd, 1¼×6	do.	0	13	0	0	13	3
Do. do. do. do. 1×6	do.	0	10	9		—	
Do. do. do. 3rd, 1¼×6	do.	0	11	9		—	
Do. Nederkalix, Yellow, 1st, 1×6½	do.	0	9	9		—	
Do. Skonvik, Yellow, 1st, 1×6	do.	0	10	9		—	
Do. do. do. 2nd, 1×6	do.	0	10	6		—	

Hard Woods.

		£	s.	d.	£	s.	d.
Ash, Quebec	per load	4	5	0	7	7	6
Birch, New Brunswick ...	do.	2	0	0	4	10	0
Do. Quebec	do.	2	0	0	4	10	0
Box, Turkey	per ton	6	0	0	20	0	0
Cedar, Cuba	per ft. sup.	0	0	4½	0	0	6
Do. Honduras	do.	0	0	4	0	0	5½
Do. Tobasco	do.	0	0	5⅝		—	
Elm, Quebee	per load	4	0	0	8	5	0
Jarrah, planks	per ft. cu.	0	2	6	0	3	0
Mahogany, Average Price for Cargo, Honduras	per ft. sup.	0	0	4½	0	0	5½
Do. Tobasco ...	do.	0	0	4	0	0	5½
Do. Cuba ...	do.	0	0	4½	0	0	5½
Do. African ...	do.	0	0	3½	0	0	5½
Do. Lagos ...	do.	0	0	3½	0	0	5½
Oak, Wainscot	per log	2	5	0	6	0	0
Teak, Indian, logs ...	per load	9	5	0	19	10	0
Do. do. planks ...	do.	13	15	0	20	10	0
Whitewood, American, logs	per ft. cu.	0	1	3	0	1	6
Do. do. planks and boards ...	do.	0	[illegible]	3	0	3	6

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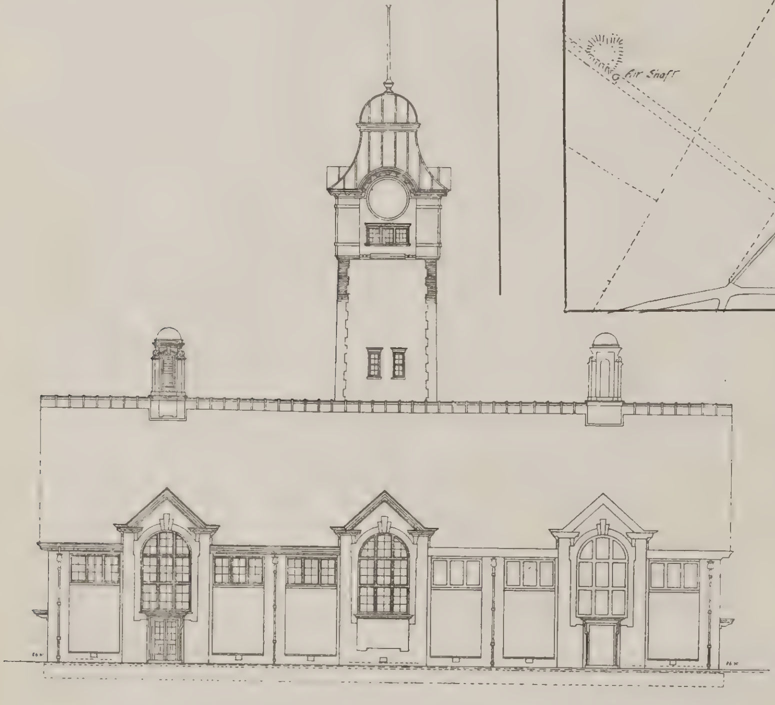
Cubic Contents and Air Supply. THE Levenshulme District Council no doubt think they have a perfection of commonsense in their argument with the Local Government Board respecting their desire to establish a building by-law to compel the provision of a minimum size in the superficial area of one living-room and one bedroom in cottages to be erected in their district. The Local Government Board refused to confirm this by-law and have stated that under the Public Health Act of 1875, and the amending Acts, the local council have no power to make such a by-law, and, consequently, if one were made and confirmed by the Local Government Board, it would be of no effect. The Council seem to be working themselves into a frenzy over what they have considered to be a national danger unrecognised by anyone before they discovered it. They hold that immediate steps should be taken to remedy the defect, as they feel it is imperative in the interest of good health that local authorities should be able to prevent the erection of cottages with a number of very small living-rooms and bedrooms. The Levenshulme Council demonstrate to their own satisfaction that "the law is a hass," for it only now allows councils to make by-laws to allow (1) for the height of rooms, and (2) for the air-space about buildings. Moreover, they argue that a local authority can make regulations prescribing a minimum cubic area for cows, but cannot prescribe a minimum area for human beings. Now though it is easy to show that there are anomalies in the various regulations, all such demonstrations tend more to show the uselessness and hardship of too stringent interference by Government enactments in the construction of buildings. The present Local Government Board wisely see that former Boards went too far, and they are not going to be moved by the Levenshulme busybodies into still further increasing the cost of building by stringent regulations for which there is no real need. The air supply in a room is not dependent upon its size. It is solely dependent upon the means of ventilation. We think it is to be regretted that local councils are allowed to regulate the minimum height. It has been proved over and over again that a room may be of ample flooring area and height and yet the air is stagnant, while isolation is the only preventive to the spread of infectious diseases. There is perhaps more reason in insisting upon a large cubic air-space for cow-sheds than there is for human habitation, because animals cannot help themselves, whereas a person has sense enough to see that he has sufficient air supply. But, as we have said, cubic contents will not ensure ventilation, and it would be far better to regulate the isolation of animals and the ventilation of cow-sheds. With reference to houses, the very necessity of providing accommodation for furniture assures a minimum of cubic contents, and, therefore, there is no need to make any regulation in that respect. If we must have by-laws on the point, let them be in regard to means of ventilation. Even then we cannot ensure that the inhabitants will not block up every entry for the fresh air, as the poor so often do in order to secure warmth and to economise fuel.

An English Parthenon. A PROPOSAL is on foot for the completion of the national monument on the Calton Hill, Edinburgh. All who know Edinburgh will recollect that the monument consists at present of only 12 Doric columns along the front. The proposal is for the completion of the building on the model of the Parthenon at Athens, to house the Scottish National Gallery. The Corporation of Edinburgh, to whom the Calton Hill belongs, thinks sufficient of the proposal to have expressed its readiness to give a site on the Hill for the National Gallery if the Government decides upon placing it there, and the Lord Provost, magistrates and council of Edinburgh have accorded as wide a circulation as possible to a pamphlet on the subject by Mr. William Mitchell, S.S.C. The matter came before the House of Commons last Friday, when the House went into Committee on the National Gallery of Scotland Bill. There was considerable discussion on the subject of the disposal of funds, and it was explained that the Government's proposals consisted in altering the building at present known as the Royal Institution, in order to make it serve as a picture gallery and accommodate the Royal Academy. The alteration of the Royal Institution building will cost about £14,000. The Royal Society, who have hitherto occupied rooms in the Royal Institution, are to be given new premises which are to be acquired for them. The School of Art, which hitherto has occupied premises in the Royal Institution building, is also to be removed to other premises. It was intimated that, although the Government does not approve of the suggestion that a site should be found for a new National Gallery for Scotland on Calton Hill, the present scheme does not stand in the way of a larger development hereafter. If persons came forward with sufficient funds for carrying out a larger scheme the Board of Trustees would be glad to consider it. We fully recognise the need for a new National Gallery for Scotland, but we do not favour the proposal outlined above. Fancy restorations of ancient buildings have nothing of the charm of the original, and how the Greek temple is to be emblematical of the Scottish nation we do not quite see. Such a copy is more suited to Earl's Court. There are capable men enough in Scotland to produce a national memorial in a national style worthy of its position and of Scottish ideals.

DUKE OF YORK'S SCHOOL, DOVER.

For many years past it has been evident that Chelsea is no longer a suitable place for the Royal Military School founded by the Duke of York at the commencement of the nineteenth century. It was decided, therefore, to remove the school to a more congenial place. Dover was eventually selected, the site there secured being of about 140 acres extent on the rolling slopes of the South Downs near Frith Farm, with an open prospect to the Channel. The school is for 550 boys, the sons of men who have served in the Army, preference being given to those boys whose fathers have been killed or who have died in service abroad. Provided the education test is passed satisfactorily, boys are admitted at about 9 years of age, they are clothed, fed and educated free of charge, and then at 14, if fit and willing to serve in the Army, they are enlisted: 90 per cent. enter the Army, while those who do not are apprenticed, placed in service, or handed over to their friends.

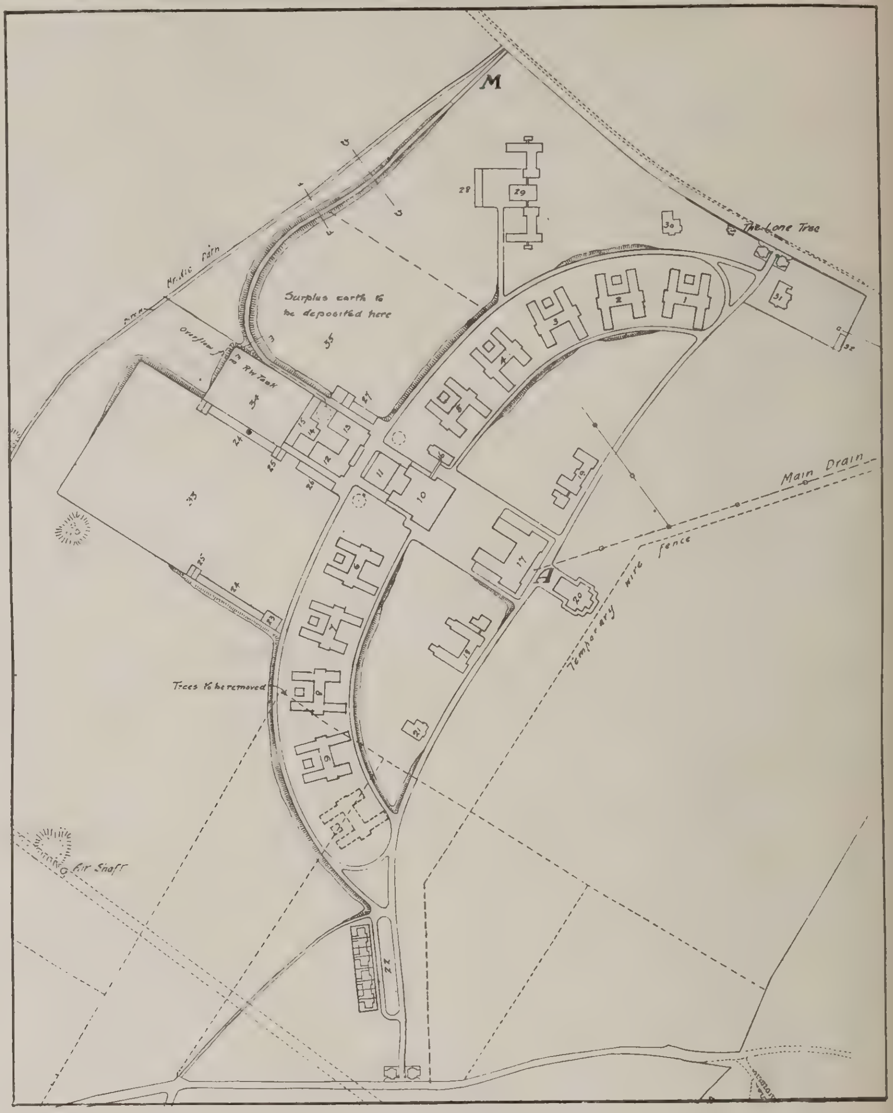
The scheme of the new school at Dover was originated by Sir Henry Tanner, Principal Architect to His Majesty's Office of Works. As the accompanying block-plan shows, it is admirably laid out, there being a central block comprising dining hall, kitchen, &c., with five dormitory blocks on either side (two of which, however, will not be built at present), school house, administration and students' blocks, with chapel in front, and swimming bath, gymnasium, boiler-house and workshops at the rear, and a hospital, mortuary and disinfecting block disconnected at one side.



SOUTH ELEVATION.

The site of the present school at Chelsea is, of course, a very valuable one; so much so, indeed, that it is stated there will be a sum of £100,000 in hand after the new school has been erected with the funds derived from the sale of the old site and buildings.

The total cost will be about £170,000. The buildings were commenced last March and should be completed early in 1908.



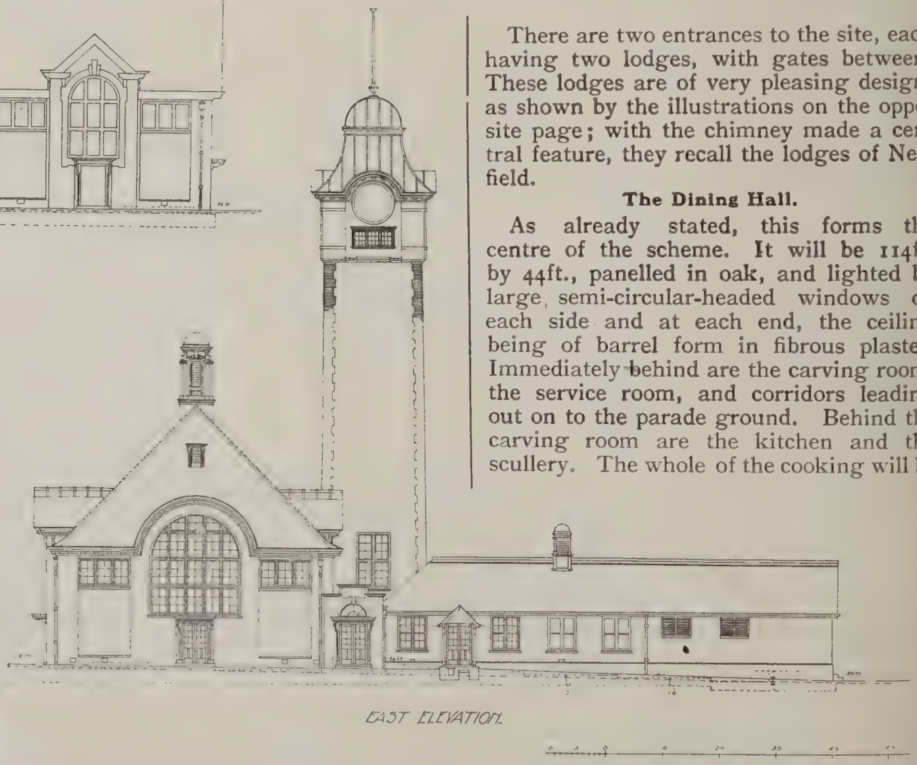
BLOCK PLAN.

1-9, dormitories; 10, dining hall and kitchen; 11, quartermaster's stores; 12, 13, swimming bath and gymnasium; 14, 15, boiler-house and laundry; 17, school; 18, students' block; 19, administration block; 20, chapel; 21, chaplain's house; 22, cottages; 23-25, playsheds, with fives-courts and band-room; 26, 27, workshops; 28, mortuary and disinfecting chamber; 29, hospital; 30, medical officer's house; 31, commandant's residence; 33, playground.

There are two entrances to the site, each having two lodges, with gates between. These lodges are of very pleasing design, as shown by the illustrations on the opposite page; with the chimney made a central feature, they recall the lodges of Nesfield.

The Dining Hall.

As already stated, this forms the centre of the scheme. It will be 114ft. by 44ft., panelled in oak, and lighted by large semi-circular-headed windows on each side and at each end, the ceiling being of barrel form in fibrous plaster. Immediately behind are the carving room, the service room, and corridors leading out on to the parade ground. Behind the carving room are the kitchen and the scullery. The whole of the cooking will be



EAST ELEVATION.

DINING HALL AND KITCHEN BLOCK.

done by gas, and six flues are provided for the gas ovens. On the western side are large stores for bread, grocery, dry goods, knives, &c.; on the east side the matron's office, the servants' hall, two extensive meat larders, wood and other stores; while immediately behind the dining-hall block are the quartermaster's stores, tuck shop and canteen. At the side of the dining hall rises the central tower, 100ft. high. It will have a clock dial on each face, and will also contain water tanks having a capacity of 8,800 gallons.

The Chapel.

This is centrally placed at the front of the site. We give elevations, section and plan of it as a centre plate in this issue. The chapel comprises a broad nave with shallow transepts, chancel, organ chamber and vestries, and a gallery at the northern end. Flanking the entrance are two octagonal towers, with a large semi-circular window between them. The nave roof is supported on each side by five massive arches, springing from octagonal stone piers, the roof being of open construction with framed trusses in Oregon pine. On the ridge is a lead and oak shingle turret utilised as the ventilation exhaust. The walls of the chapel are of red brick, with Darley Dale stone dressings and bands.

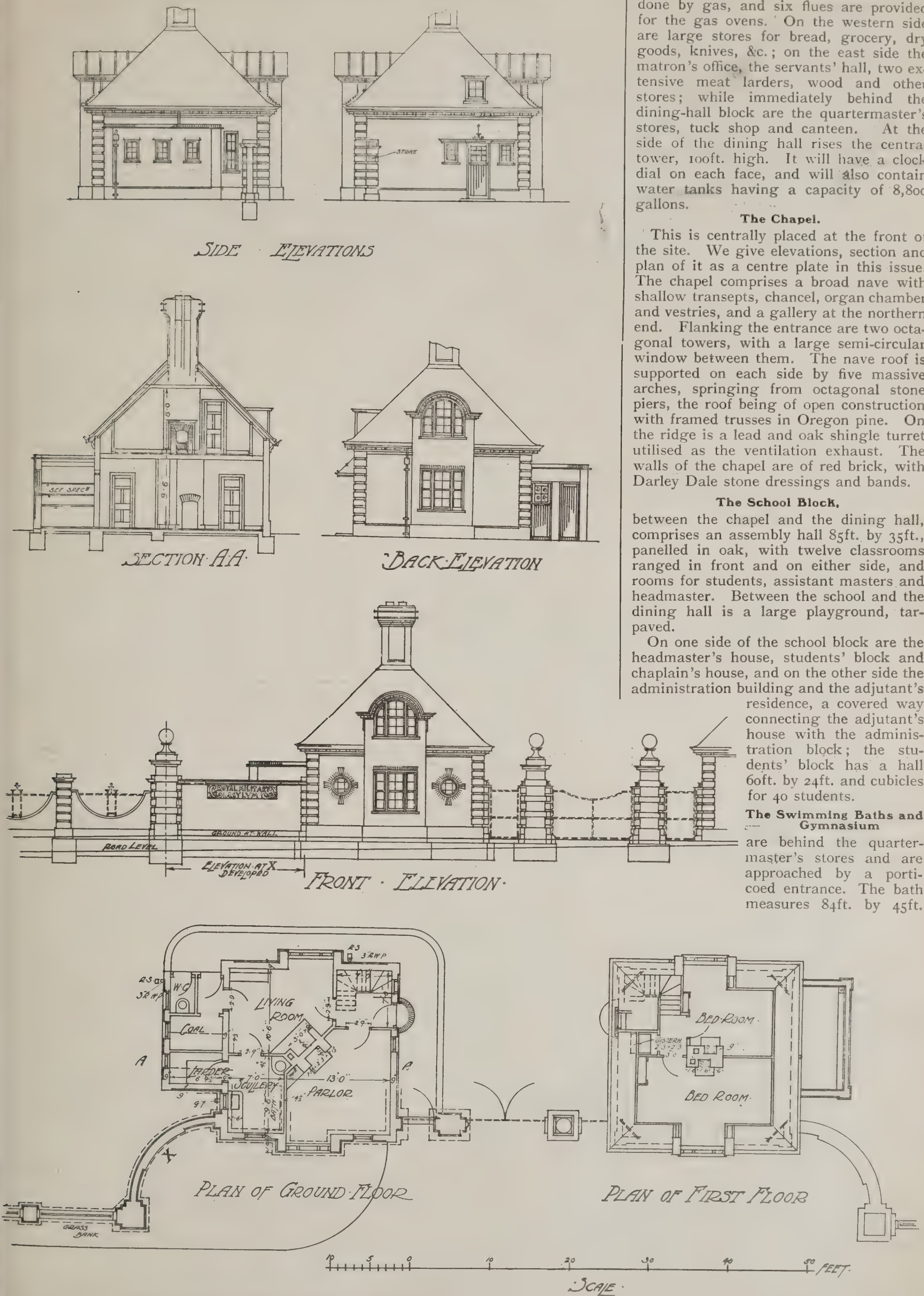
The School Block,

between the chapel and the dining hall, comprises an assembly hall 85ft. by 35ft., panelled in oak, with twelve classrooms ranged in front and on either side, and rooms for students, assistant masters and headmaster. Between the school and the dining hall is a large playground, tar-paved.

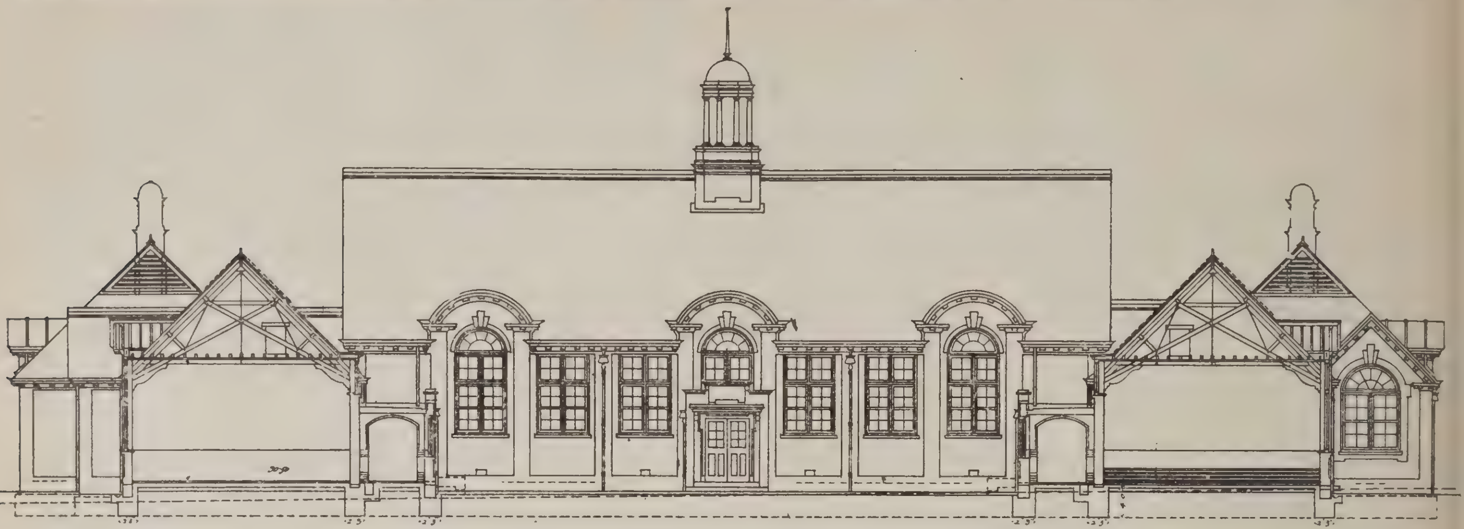
On one side of the school block are the headmaster's house, students' block and chaplain's house, and on the other side the administration building and the adjutant's residence, a covered way connecting the adjutant's house with the administration block; the students' block has a hall 60ft. by 24ft. and cubicles for 40 students.

The Swimming Baths and Gymnasium

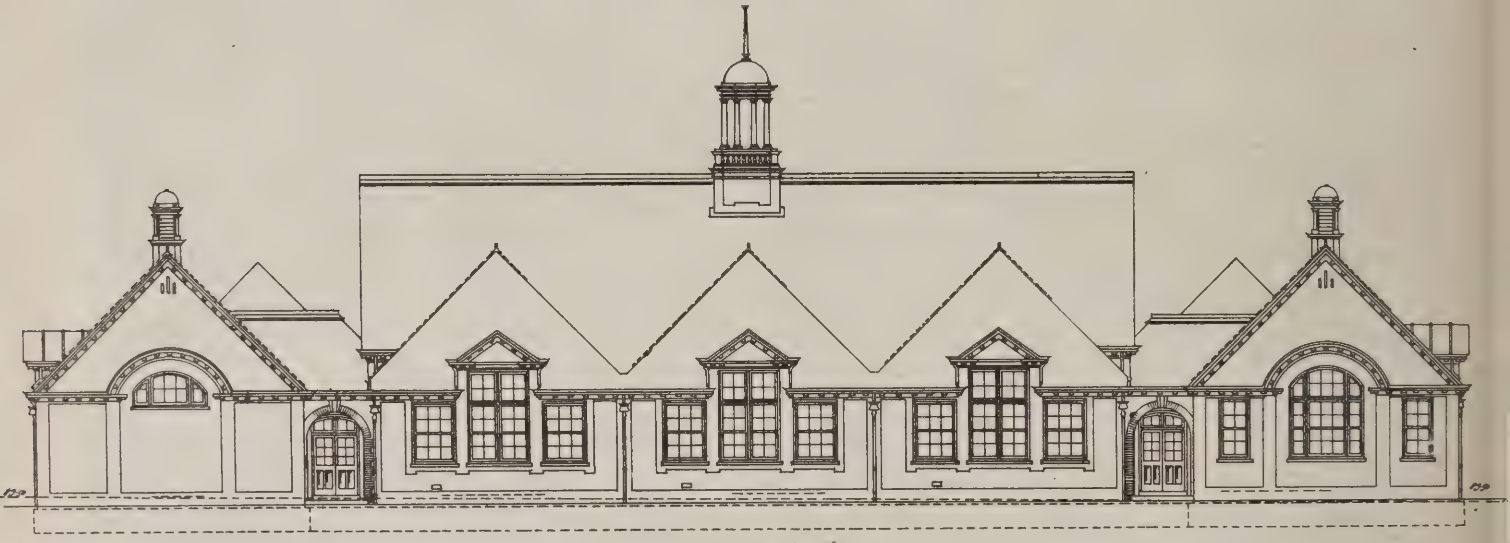
are behind the quartermaster's stores and are approached by a porticoed entrance. The bath measures 84ft. by 45ft.



DUKE OF YORK'S SCHOOL, DOVER: ENTRANCE LODGES. SIR HENRY TANNER, PRINCIPAL ARCHITECT, H.M. OFFICE OF WORKS.



North Elevation and Section.



South Elevation.

with a depth of water ranging from 3ft. to 6ft. 6ins., and will be lined with glazed bricks; a gallery runs round. The gymnasium, adjoining, is 100ft. by 45ft., with a gallery on three sides. Behind these buildings are the boiler-house, engine-room, laundry and wash-house, and on either side are workshops where the boys will be taught trades—there being shops for bootmakers and tailors.

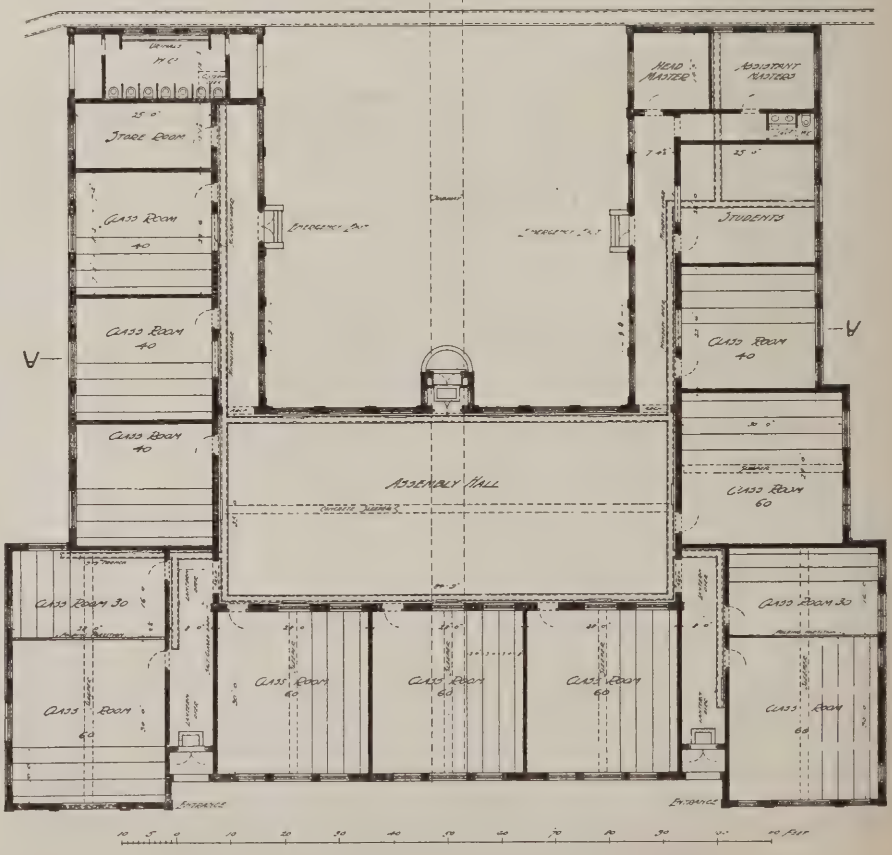
The Dormitories

are set out on a chord and are all similar. They are built right- and left-handed in the form of an H, the cross-bar being the day-room or central hall, 43ft. by 24ft., while three of the legs form dormitories, with the house for master and matron in the remaining leg.

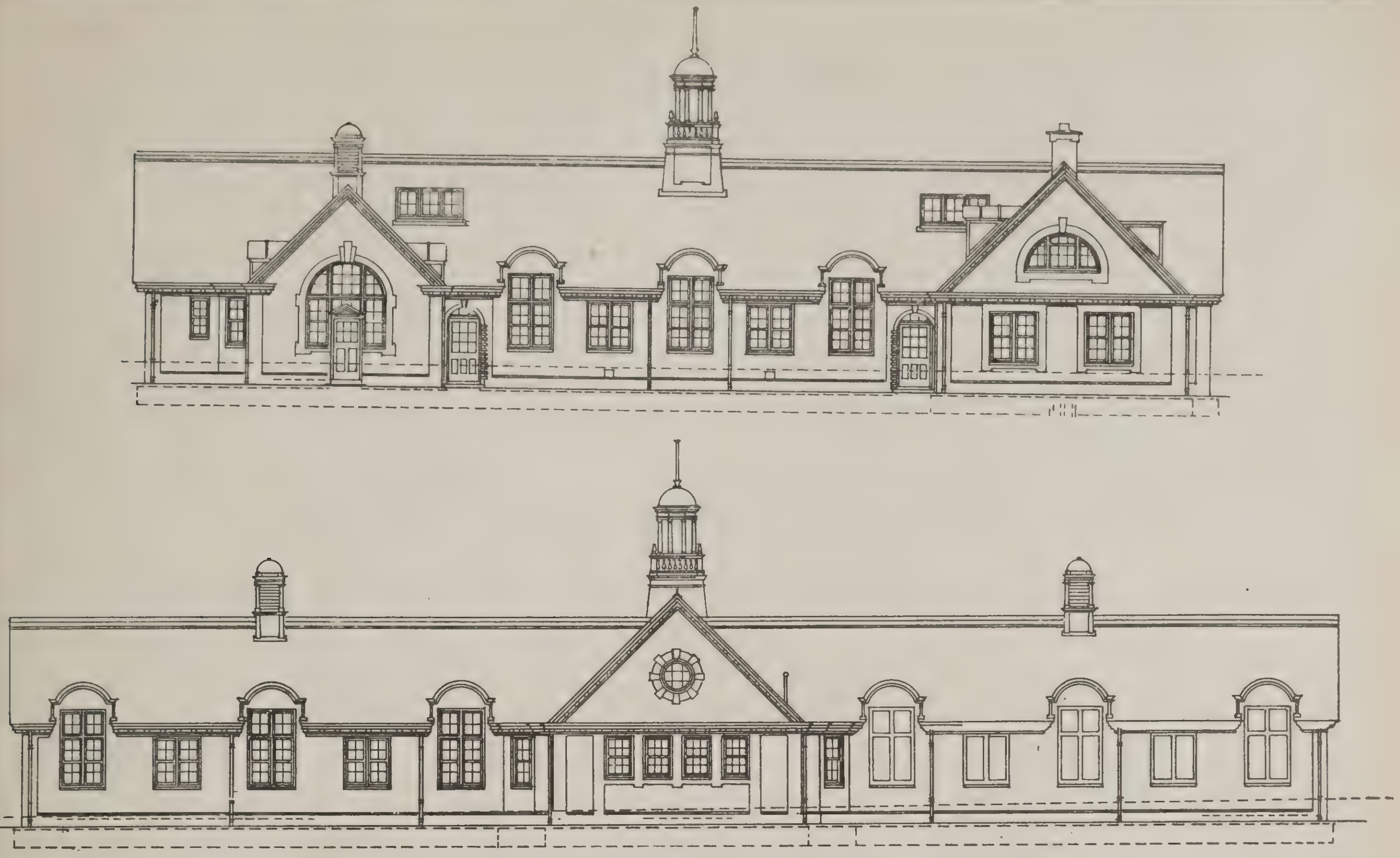
The plan is very conveniently arranged and the elevations are designed in a quiet manner, with well-proportioned windows breaking above the eaves-line—as shown by the illustrations on page 305. It will also be noticed that in the rear, between the two projecting wings, is a sanitary block, with a room also for cleaning boots &c.

The Hospital

is on the north-east portion of the site facing south. A central corridor leads to six large wards, to which are attached baths, lavatories, and other accommodation. There are also two day-rooms and a waiting hall, and doctor's, matron's and dentist's rooms, dispensing store, &c. There is also attached



DUKE OF YORK'S SCHOOL, DOVER: THE SCHOOL BLOCK.



to the hospital a kitchen, larder and scullery, entirely distinct from those in the main building. The central part of the hospital rises to a second floor, in which are nine bedrooms for the accommodation of the staff. At the rear, and detached, are a mortuary and a disinfecting room. The hospital block will be built on arches, so as to bring up the level of the floor clear of the ground.

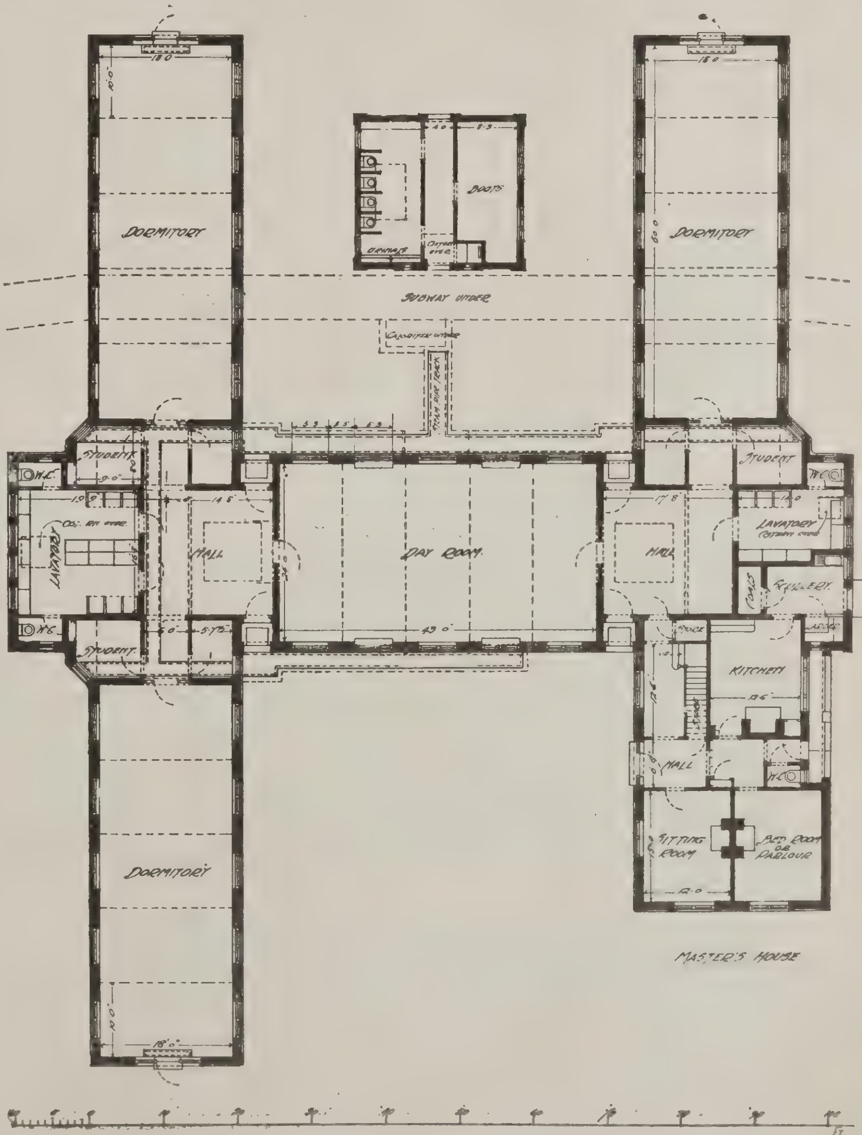
Other buildings disposed about the site are the commandant's and medical officer's houses near the main entrance, and eight cottages near the secondary entrance.

The Playground.

Close to the school is a tar-paved playground measuring 630ft. by 430ft., with playsheds on each side 200ft. wide and 18ft. wide, and fives-courts; also a bandroom 35ft. square.

The buildings are being erected with red brick plinths and dressings, the body being filled in with rough-cast formed of small shingle, which is kept in its natural colour. This gives the elevation a warm and very pleasing effect. The roofs have all overhanging eaves, and are covered with tiles. The eaves, in most cases, have a modillioned cornice, whilst the doorways have projecting hoods supported on cut brackets having moulded fascias, and covered with lead. Internally, all the rooms where much work is carried on are faced with glazed bricks, dark brown dado or skirting, with ivory white above; the remainder being, in most cases, plastered in the ordinary manner, except the dining-room, board-room, and school-room, which are panelled with oak.

Throughout the buildings the most approved methods are being followed, there being a 6-ft. concrete subway under the blocks, in which all pipes, cables, &c., will be laid, so as to be readily inspected. Mr. Pickett is the clerk of works.



DUKE OF YORK'S SCHOOL, DOVER: DORMITORY BLOCK.

R.I.B.A.

Mr. Dibdin on Mortar.

A meeting of the Royal Institute of British Architects was held on Monday evening at 9, Conduit Street, W., the chair being occupied by Mr. T. E. Collcutt, president.

Sir William Emerson presented a portrait painted by Mr. Solomons, R.A.) of Sir Aston Webb, R.A., late president of the Institute, which was acknowledged by Mr. Collcutt.

A paper on "The Composition and Strength of Mortar" was then read by Mr. W. J. Dibdin, F.I.C., F.C.S.

The author said that the composition of ordinary lime mortar in relation to the resulting strength is in the highest degree important. The by-laws of the London County Council regarding the composition of mortar merely specify that it shall be composed of freshly-burned lime and clean sharp sand or grit without earthy matter, in the proportions of 1 of lime to 3 of sand or grit, but contain no reference to strength, leaving it to be inferred that if the composition is within the strict definition the strength must necessarily be practically constant—quite apart from the particular purpose for which the mortar is to be employed. Further, no "factor of safety" seems to have been considered; so that, whether the mortar is used for a 10-ft. wall or one of 100ft. in height, the by-laws equally apply without any precautions.

Mr. Dibdin proceeded to describe a series of experiments he had carried out on briquettes and blocks specially made for the purpose.

The results of the tensile and crushing tests showed that mortar made with the proportions of 1 volume of sand to 1 volume of lime with the sand unwashed as received had a crushing strength of 150lbs. per cub. inch. When the sand was increased to 2 volumes the strength fell to 92lbs. per inch. With 3 volumes sand it was only 52lbs., and with 4 volumes 53lbs. This experiment clearly indicated that an arbitrary limit of 3 to 1 is unsatisfactory, as it would prevent the use of the "excess" of lime, which in this case gave three times the crushing strength of that obtained when the by-law proportion of 3 to 1 was employed. In all the subsequent sets of this series the sand was used washed and graded. The illustrative diagram clearly brought out the fact that when the proportions were from 1 or 2 of sand to 1 volume of lime the strength was greater than when 3 volumes of sand were employed in all those cases in which the sand was coarser than $\frac{1}{50}$ in.; but when the grading was from $\frac{1}{50}$ in. and below, the strengths of the various makes were practically equal—namely, from 58 to 66lbs. per inch.

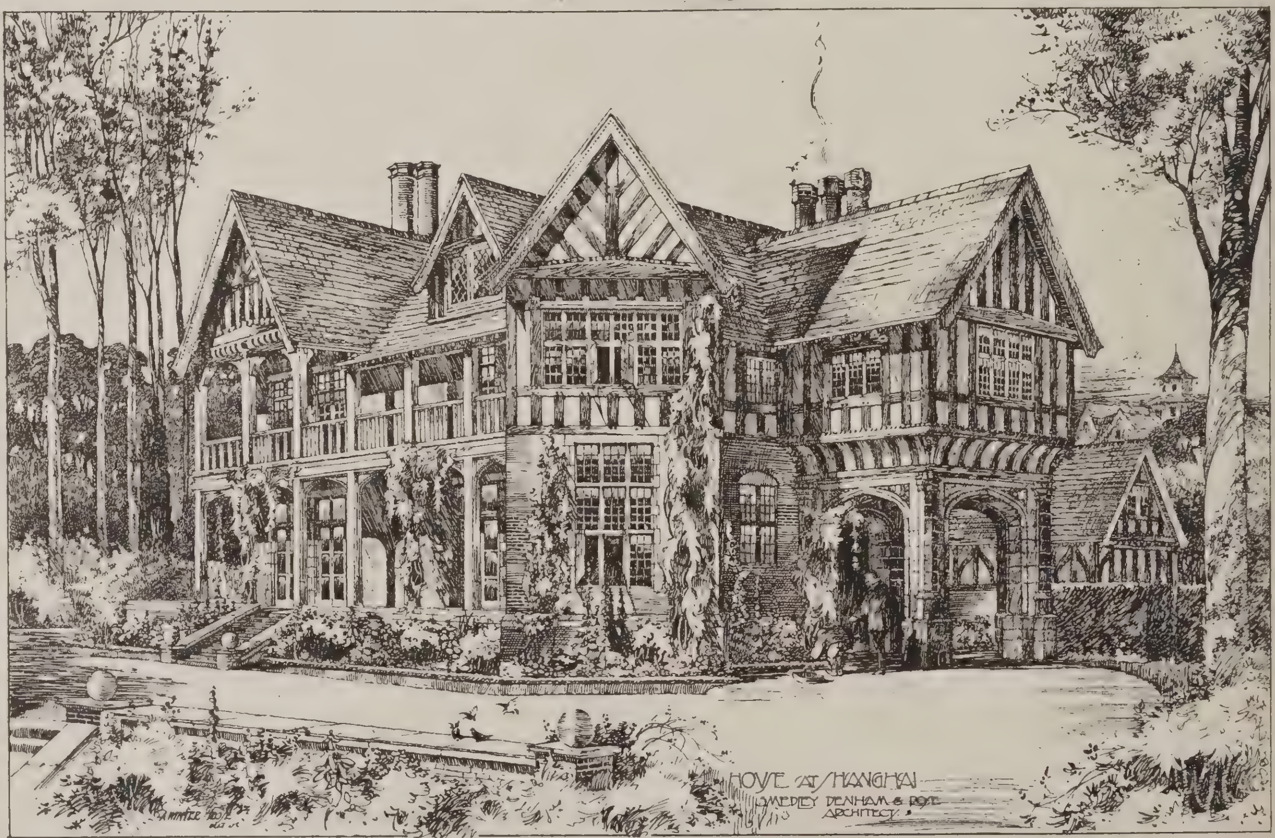
The tests for tensile strength were in the same ratio, and clearly indicated that with these particular sands an *excess* of lime in contravention of the by-laws was a distinct advantage.

The results given in a further series showed the effect of time, up to eleven days, between the moment when the mortar was mixed and that at which the briquettes and blocks were prepared. From these it would seem that up to seven days there is an increased strength, but after that time—that is to say, after the mortar had once set—the effect of a second breaking-up was distinctly detrimental, although better results were even then obtained than at any time before the first setting.

Conclusions.

Summing up in conclusion the results of a fairly exhaustive series of tests, so far as the limits of the experiments extended, Mr. Dibdin said it seemed certain that the strength of a mortar depends far more upon the physical character of the materials employed than has hitherto been fully realised. If the usual prescription of 3 to 1 be rigidly adhered to, the mortar may have in certain cases only one-third of the strength of that which might be obtained with as widely varying proportions as 5 of sand to 1 of lime; and it would appear to be desirable that the *strength* as ascertained by crushing should be the *criteria* rather than by arbitrary proportions. The tests can be made with great facility, and should be employed in all cases. Mr. Dibdin said he must not be taken to suggest that any and every admixture should be sanctioned; but where the materials are clean and sound and free from dirt (such as unwashed road sweepings, dustbin refuse, old mortar, &c.), no unreasonable objection should be taken to their use provided that they yield a mortar having strength sufficient for the work in hand.

A discussion followed, in which Messrs. Searles Wood, William Woodward, Max Clarke, Alan E. Munby, W. D. Caröe and T. E. Collcutt took part. On the motion of Mr. Max Clarke, the following resolution was passed:—"That this meeting is of opinion that the question of the composition of mortar is a matter which deserves the fullest consideration, and with that end in view, the Council be asked to vote a sum of money to aid investigation into the subject."



This house, which is executed in red local bricks, stone dressings and oak framing, is for Walter Carter, Esq., of Shanghai. The roof, which is constructed of Singapore red wood, is covered with black fibrous cement tiles imported from France. The doors and internal woodwork, where not painted, are of teak, the windows having Malava hardwood frames and cedar casements. The servants' quarters are over the stables at the rear of the building. The best aspect for houses in Shangai is the south, whence come the cool summer breezes. The back of the house is closed up as much as possible in order to protect it from the cold north winds of the winter. Messrs. Smedley, Denham and Rose, of Shanghai, are the architects.

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Supplement to
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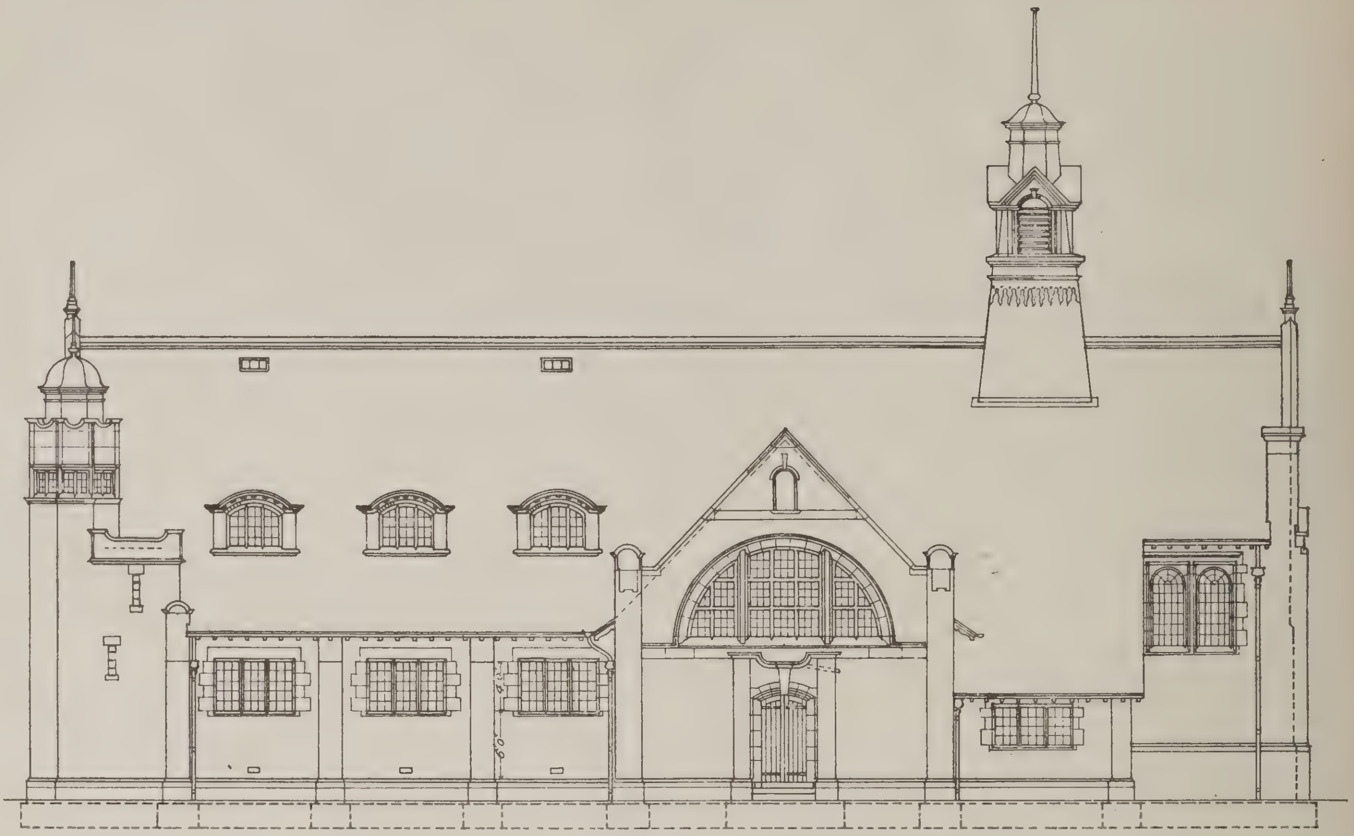
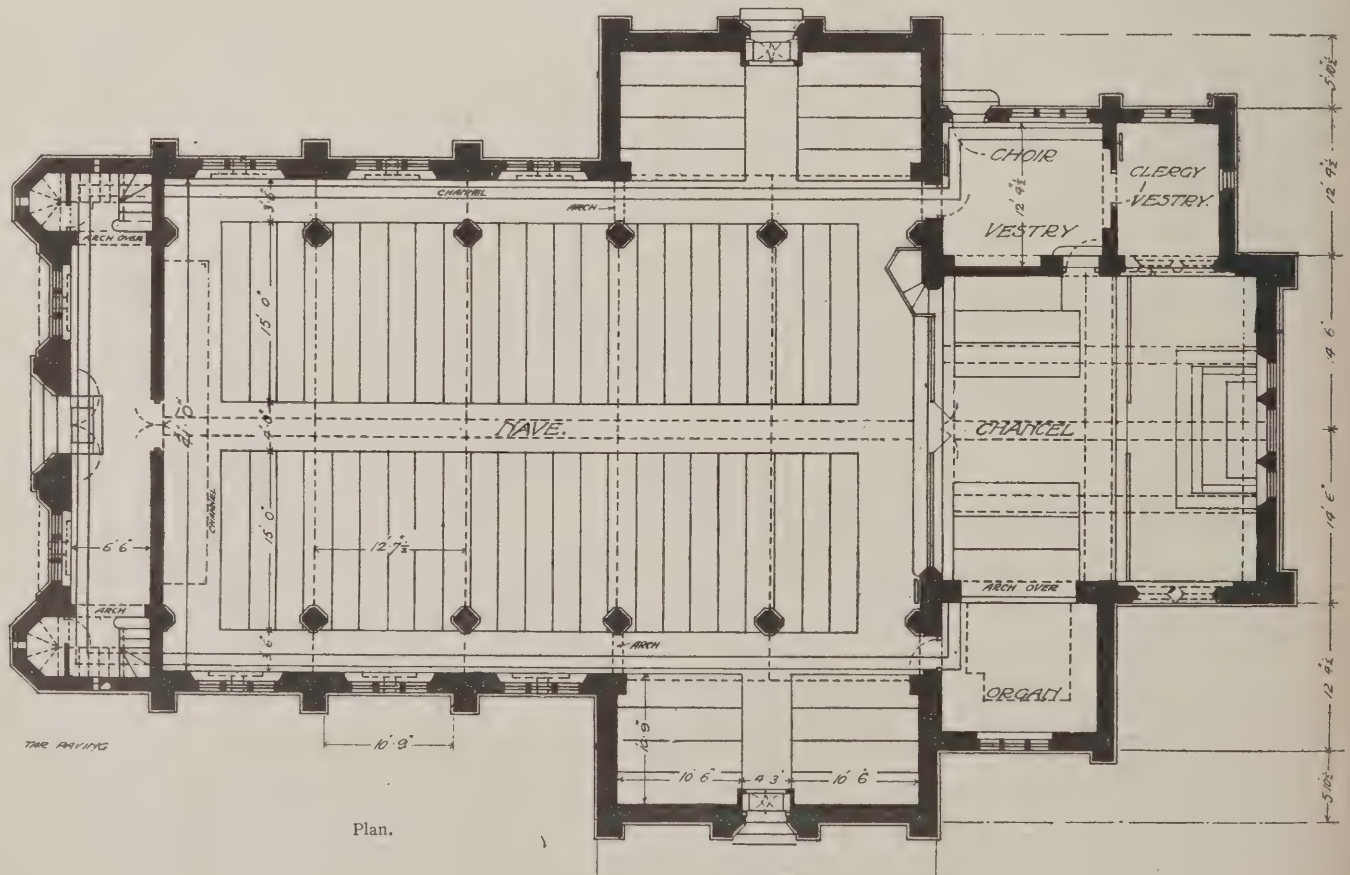
Wednesday, December 19th, 1906.

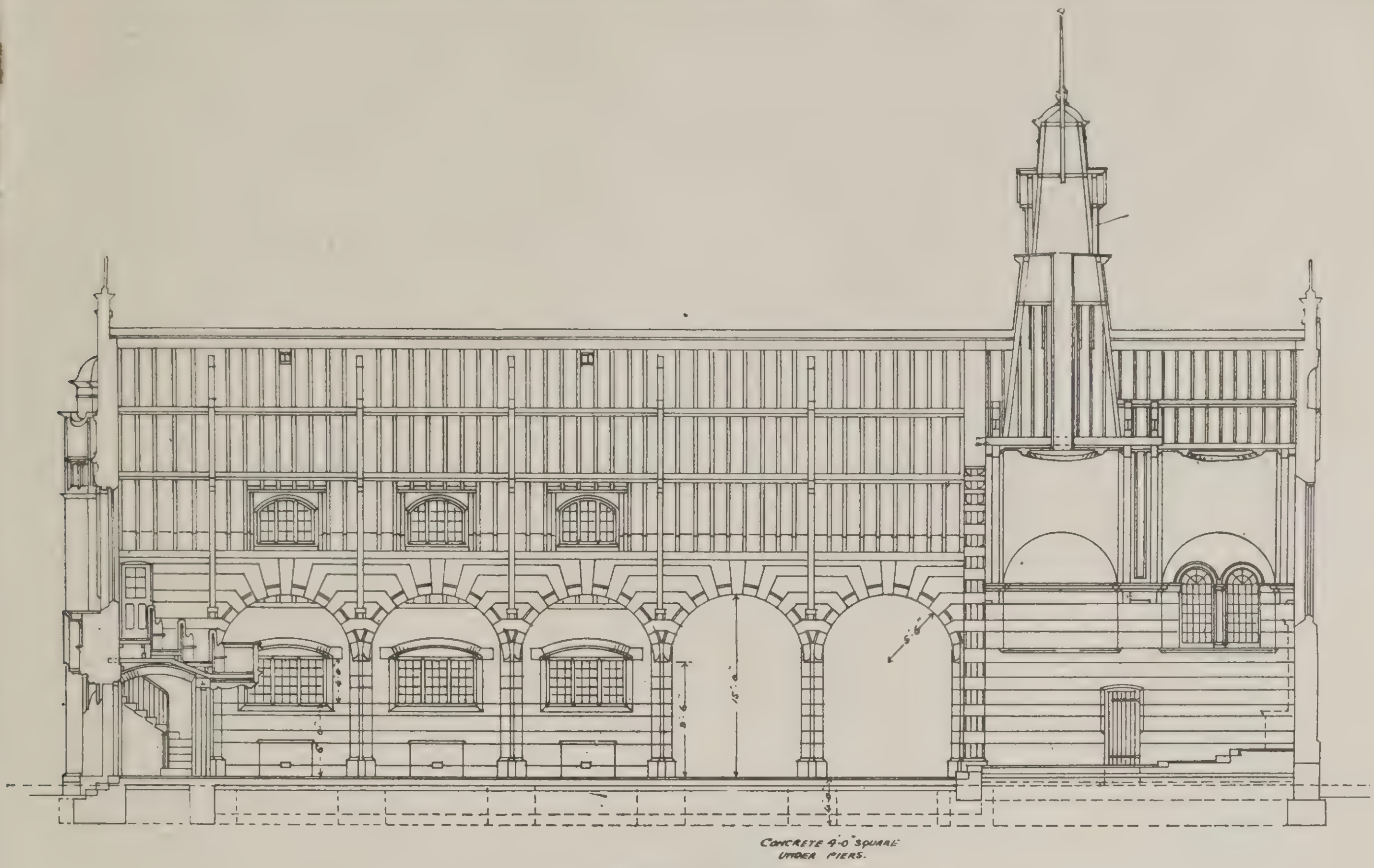


West Elevation.

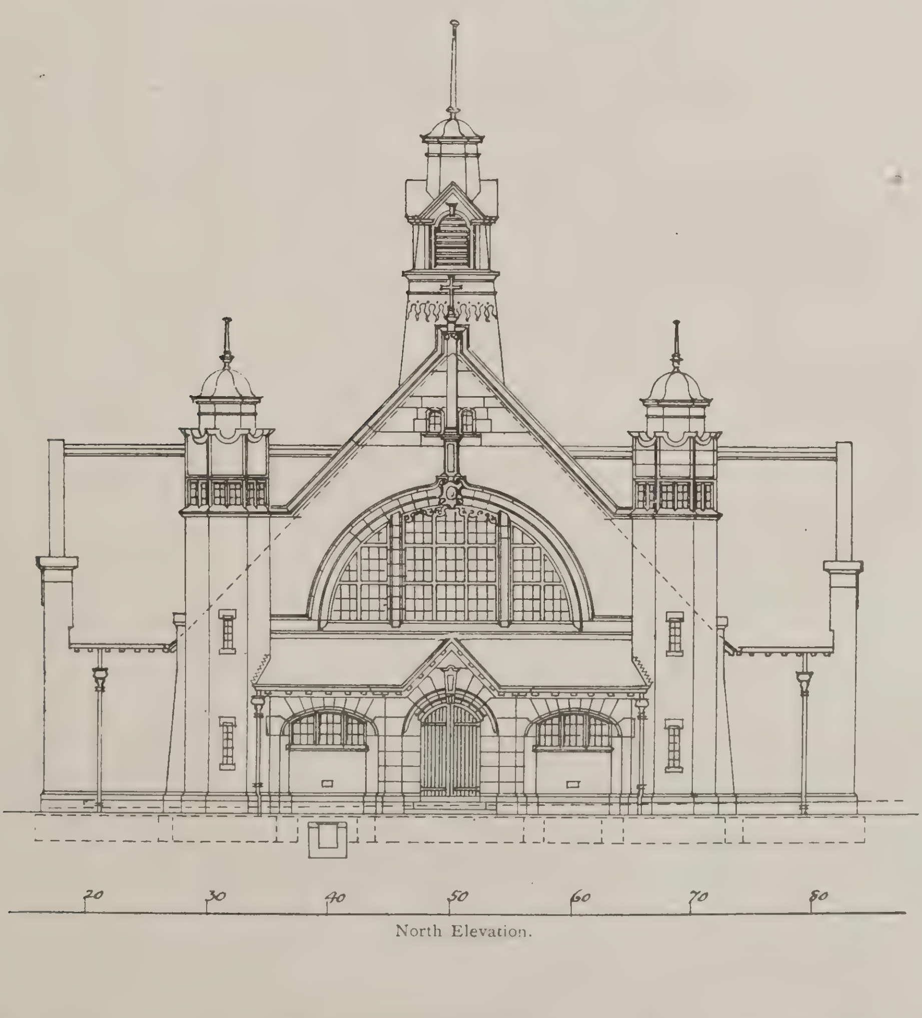


Plan.

DUKE OF YORK'S SCHOOL, DOVER: THE CHAPEL.



Longitudinal Section.



North Elevation.

IRY TANNER, PRINCIPAL ARCHITECT, H.M. OFFICE OF WORKS

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THE ARCHITECTURAL ASSOCIATION.

Mr. Seth-Smith on the Architecture of Sicily.

A meeting of the Architectural Association was held on Friday evening last at 18, Tufton Street, Westminster, the chair being occupied by Mr. Louis Ambler, vice-president, in the absence through illness of the president. Mr. R. S. Balfour, who, however, is making good progress towards recovery.

A paper on "The Architecture of Sicily" was read by Mr. W. Howard Seth-Smith, F.R.I.B.A. Before proceeding to deal with the history and character of the architecture on the island, Mr. Seth-Smith warned the student as to accepting even the best guide-books as authorities. "In this instance let him read beforehand, and again on the spot, such works as C. A. Cummings's 'History of Architecture in Italy,' Fergusson's 'History of Architecture,' Baldwin Brown's 'From Schola to Cathedral,' Leader Scott's 'Cathedral Builders'; and consult in the Institute Library such works as Gravina's 'Il Duomo di Monreale,' Delhi, Gally-Knight, Hittorff, Mothes, Sabazaro, Dautier, &c."

For supremacy over Sicily, Phœnicians, Etruscans, Greeks, Romans, Byzantines, Saracens, Normans and Spaniards in succession had struggled, but we should be disappointed if we expected to find many monumental evidences of their occupations, for, with the exception of those of the Greek, Roman and Norman periods, scarcely any traces remained.

The classic Greek period of 500 years extended from 735 B.C. to 210 B.C., when the Romans finally conquered the island. Notwithstanding the obliteration of the vast city of Syracuse (excepting the theatre), there are important remains still standing of two fine temples at Gigenti and one at Segesta, all, however, bereft of their setting as the central or foreground objects in great and beautiful cities.

Of the great scale of some of these temples an idea could be formed when it was stated that the cast of an abacus of a capital in the Palermo Museum was 12ft. 6ins. square, and the caryatid of Jupiter in his temple at Gigenti more than 24ft. in height.

Of the Roman dominion, which lasted 600 years—namely, from 210 B.C. to about 400 A.D.—fewer still were the evidences. The Romans plundered Sicily of all its treasures of Greek art. The great theatre at Taormina is, however, mostly Roman. From Roman times until 535 A.D. the northern tribes held sway, when the island was made subject to the Byzantine emperors, who retained it till they in their turn were conquered by the Arabs. The Arabs ruled for more than 200 years, but almost the only genuine Arab monuments remaining are the Baths of Cefalà and the gate of the town of Ortigia (Syracuse). Following the Arabs came the Normans.

The Early Churches

When Roger, the first Norman king, was crowned in 1030, churches began to rise all over the island. Several of the earlier churches are modified transcripts of smaller monuments of the Eastern towns—a Greek cross in a square with central dome, sometimes repeated in the adjacent bays, and with three apses on the eastern side. The little church of La Martorana, commenced about 1129, well illustrates this type. S. Giovanni degli Eremiti, however, though of the same date, has a different plan altogether, being T-shaped, and without aisles. The custodian and most of the guide-books state that this church was originally an Arab mosque converted to Christian uses; the plan, however, is thoroughly Byzantine; the cloisters are very beautiful—arcades of pointed arches on coupled twisted columns. Another and most remarkable example of Byzantine arrangement and construction is the little chapel at Malvagna, near Randazzo—only 18ft. square, with semi-circular apses opening from three sides.

In all these instances the Normans allowed their monuments to be built in the style and with the decorations familiar to the peoples they governed. The pointed arch here first introduced to them became general, but it was the arch of the Saracens, broad, high-stilted, and without mouldings, and had no relation whatever to the use of the pointed arch of the north of Europe, which was even then beginning to be introduced in the monastic architecture of Italy. Nowhere in Sicily is there any instance dating from this period of an interior which has any hint of a Gothic system. The use of the intersecting vault is confined entirely to the small bays of the aisles or porches, while the naves where not domed or covered by the equally Oriental stalactite ceiling, are invariably covered with an open timber roof.

The Capella Palatina.

This chapel was built by King Roger in the Royal Palace and is one of the most interesting and valuable monuments of the splendid architecture of the Norman kings. In general plan it was more in harmony with the tradition of Italy. It is only in the treatment of its details, in the use of the pointed arch, and in its sumptuous decoration that we feel the influence of the mixed Orientalism which coloured all the art of Sicily at this period. The nave has a carved wood ceiling of the richest Moorish character, similar to those in Granada and Seville, and decorated lavishly with gold and colour. Even without its gorgeous colour, the lighting of this church would be fine. "In no other interior which I have seen," said Mr. Seth-Smith, "is the contrast of light and shade so fine, reminding one of the Spanish cathedrals." The glazing of the windows is quite without colour—a most important principle, as any stained glass would have confused the scheme of wall colouring.

"In this lovely chapel Norman architecture in Sicily came to its full flowering. In later monuments we find equal magnificence, but nowhere more typical or more beautiful expression of the geniuses of the place and time."

The Mosaics.

Speaking of these, Mr. Seth-Smith said that in no spot in the world could the principles and methods of the early mosaicists be more successfully studied than in Sicily. Those at Santa Sophia were largely hidden from view behind Mohammedan whitewash, or destroyed, while much at St. Mark's, Venice, had been restored out of recognition, or had given place to imitations of painter's art. The decorations of the Palerman churches represented the zenith of Byzantine mosaic art of the Second Period. Nothing finer had been done before, even at Santa Sophia, or St. Mark's, and nothing so fine followed. The Sicilian mosaics were kept sufficiently distant from the eye to prevent an unpleasant sense of the coarseness of the material and its joints, and to blend its irregular lines and surface into a rich and harmonious whole.

The method of execution employed in Sicily and elsewhere in mediæval times was as follows:—A coat of fine lime mortar was spread on the wall upon which, when fresh, the picture was broadly painted in fresco in the proper colours. The painter was immediately followed by the mosaicist with the cubes, which were embedded in the soft mortar.

In the Sicilian Norman churches the mosaics cover the entire wall surfaces, domes and vaults, and even the angles of the archivolts are all rounded off to carry on to the soffits of the arcades. The ground is nearly all of gold—not the hot yellow gold of modern mosaics, but low-toned, soft and rich, and the decorative designs are bright in tones that do not give the effect of patches of dark on a light ground. The pallete used is a very limited one, greys and grey-blues, violets, soft greens, madders, with scanty use of silver, dark reds and russets.

The size of the cubes averages nearly 1in. square for the larger surfaces, and about ⅜in. for faces, hands, &c. The medieval method of cutting up the cakes of enamel-glass with chisel-like hammers produced the great irregularity in the cubes which, with their corresponding variety of joint and surface, gives such subtle charm to old work, compared to the modern machine-cut cubes.

The Cathedral of Cefalu.

The cathedrals of Messina and Cefalu are both nearly contemporary with the Capella Palatina. Cefalu is a church of great interest, its most striking feature being the very lofty choir opening into the nave. There is nothing like it south of the Alps. The whole body of the church is white, so that the eye is led up to the choir, and once there it remains, dwelling with intense satisfaction on the glorious wealth of colour with which the chancel is enriched by mosaics.

Palmermo and Monreale Cathedrals.

An interval of nearly 50 years seems to have elapsed between the building of the churches of Messina and Cefalu and the two great cathedrals of Palermo and Monreale, the only additional examples of the splendour of the Norman church architecture in Sicily. Palermo Cathedral was doubtless one of the most beautiful in Sicily, but the 18th-century transformation has, alas! left little or nothing except the general ground plan, and not all of that, a new east end having been built within the old. Now the frigid silence of the Palladian style reigns within, simple indeed and dignified, but lifeless as the century in which it flourished.

The Cathedral of Monreale is very richly decorated on the exterior with interlacing arcades of pointed arches, the upper stages being covered with geometrical inlay of marble and asphaltum, and the walls further enriched by horizontal bands and circles of the same character. "There are few exteriors in Europe possessing a surface decoration of equal richness." It has also some magnificent bronze doors, while the interior of the cathedral has decorations of surpassing magnificence.

Of the remaining Palerman churches S. Francesco, 1302, and its contemporary St. Agostino are, as to date, Gothic churches with many Norman details. There is also the late 16th-century church of Sta. Maria della Catena.

Correspondence.

An Old Water Main.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—On demolishing in October last old Fulledge House here (an Elizabethan house), to make way for the new Council school, a pipe line of unusual character was found. Oak beams were bored from end to end and jointed at their ends by socket and spigot of a conical kind. Some of them seem to have been made from trees. They are not halved, but bored. Two of them have been taken to the museum at Towneley Hall for reference. This may perhaps interest readers. —Yours, truly,

JOHN R. LEE,
BURNLEY. Art Master.

CONTINENTAL, ROMANESQUE, AND GOTHIC DETAIL.

A lecture on this subject was delivered by Mr. G. A. T. Middleton, A.R.I.B.A., before the Northern Architectural Association at Newcastle last week. Mr. Middleton said the English forms were distinct in many respects, due to an entirely different inspiration from that which influenced Continental work. Like the English, however, the early Romanesque of the Continent had a Roman origin, but it was much more closely allied to its original. There seemed to have been two streams of influence which followed the two main trade routes into North-Western Europe; one along the Rhine, passing northwards as far as Cologne, and then spreading out like a fan across North France and Germany, and the other traversing the South of France, and gradually spreading northwards through Poitou and Beri to the Ile de France. The former stream was much more nearly allied to the Roman than was the latter. In the doorways of Mainz Cathedral, and in many other examples, they found the Corinthian capital in an exceedingly pure form, though it was often used to carry an archway arranged in orders or stages, either unmoulded or enriched with mere rolls at the angles and shallow hollows on the main faces, such as were employed in the early Norman period in England. Arches of the same character were found in the South of France, but the detail of the carving was more Byzantine in type than Roman —*i.e.*, cut down by incision below the general surface of the stone rather than with projecting leaves and volutes, and showing a less appreciation of the use of the chisel and more of the drill. In the north-west of France those two types coalesced, forming what is known as Norman, there being super-added another influence—namely that of the Scandinavian pirates, who ravaged the whole coastline. The result was the production of an architecture whose details were of a mixed character, the classic origin being often difficult to discover beneath the Scandinavian overlap of billet or chevron, representing embroidery stitches, or of grotesque animal sculpture, or of forms suggestive of twisted wirework. Towards the end of the 12th century, when the whole spirit of architecture changed, and Gothic replaced the Norman of England and the Romanesque abroad, they were accustomed to recognise a similar change in the detail, particularly in the matter of mouldings. As a fact, however, the mouldings of France and of Germany scarcely altered from their Romanesque character until the end of the 14th century. The deep undercutting of our beautiful Early English period was unknown in France, save in a few instances where the English influence was paramount. Contemporaneously with this development of a new spirit came the evolution of true Gothic mouldings, the work of the French Flamboyant period in particular being original, and as richly cut as English work of the 13th century, entirely different from the flat and lifeless "Perpendicular" mouldings to which ours had degenerated by this time.

SCULPTURE AND ARCHITECTURE.

The paper on "Sculpture in Relation to Architecture" was read before the Society of Architects last Thursday by Mr. S. Charles Kaines Smith, B.A. Cantab. At the outset Mr. Smith emphasised that the object of architectural sculpture was to beautify, not merely to be beautiful. A clumsy, ill-built and ill-proportioned building encrusted with the most exquisite sculpture was not beautiful, nor was a fine architectural achievement enhanced by ill-conceived and ill-executed sculpture. Moreover, it was of the greatest importance that the sculpture should be sympathetically disposed about the edifice. On no pretext must its presence be allowed to disguise, weaken or falsify the structural lines. The blank wall of a reservoir dam was beautiful in its impassive strength, and the least ornament would be trivial and weakening in effect unless placed at the very crest of the wall above the known water-line, but sculptured figures on the coping would be perfectly admissible, for by their very lightness they would serve to accentuate the massive power of the dam. In the same way sculpture might be employed in conjunction with bridges—the Charles bridge at Prague and the Pont Alexander III. in Paris being cited in this connection. Mr. Smith regretted the lack of co-operation which existed between sculptors and architects. He said the general impression conveyed by the sculptured figures on recent London buildings was that they had climbed out on to the tops of the windows, or on to the parapets, and continued to recline upon their giddy couches because they were unable to retrace their perilous steps. In no sense did they form an integral part of the building. Mr. Smith then went on to describe "the most complete and perfect scheme of decorative figure sculpture in the world"—namely, on the Parthenon at Athens. This consisted of the pedimental sculptures, the Doric frieze of metopes, and the Ionic frieze on the outside wall of the cella. The Doric frieze with its series of sculptures in vigorous action was succeeded by the Ionic frieze, glowing with colour and gold in the subdued light reflected from the pavement within the peristyle, leading finally to the door of the holy place, where, in the amber twilight that filtered through the thin marble tiles, was the statue of Athena in gold and jewels, particolour of enamel and cunningly-wrought metal. "It is a climax, superb and supreme, to which the sculptor has led you, insensibly, irresistibly, because the source of his inspiration, and of that of the architect, was one and the same source, because the Parthenon without its sculptures had been a mere shell, dead and meaningless, and because those sculptures, divorced from their surroundings, could lead nowhere, could serve no purpose, and tell no story of a nation's passionate devotion."

LIGHTNING CONDUCTORS.

On December 6th Mr. Alfred Hands, F.R.Met.S., delivered a lecture before the Royal Engineers at Chatham on "The Protection of Buildings from Lightning." Mr. Hands showed the extent of damage done by lightning by means of a chart of England and Wales, on which the positions and nature of objects damaged, during a period of about nine years, were indicated by coloured spots. This included 2,485 buildings, of which 148 were churches. He criticised the report of the Lightning Research Committee, which, he said, by its contradictory recommendations and incorrect statistics, had caused a great deal of scepticism as to the utility of lightning conductors. He then showed by diagrams, and by reproductions on models of buildings of cases that had occurred, some of the more complex lightning effects that had to be guarded against and the methods of protection that had to be employed. These included fires caused by the surging effect of a discharge, and cases in which damage is caused to a building by lightning striking an object half a mile away. Mr. Hands laid stress on the impossibility of protecting buildings efficiently by means of set rules. Each case had to be studied separately and that system of protection applied which the complications of metal in and about the structure showed to be necessary.

Mode of Application All-Important.

Hitherto, said Mr. Hands, too much importance had been attached to the form and composition of the conductor, and too little to the fact that its efficiency depended almost entirely on the way in which it was applied, and very little on what it was. He regarded the subject as somewhat analogous to the work of a medical practitioner. The conductors in the hands of an expert were comparable to the drugs a physician might find it necessary to prescribe according to his diagnosis of the case. We were not infallible, and anyone might overlook some factor that might have an important bearing on the case, but the fact remained that the possession of knowledge, experience and an ability to discriminate as to the importance of details should enable a man to protect a building effectively, while absence of these would very probably result in failure.

Relative Value of Iron and Copper.

As regards the relative value of iron and copper for conductors, he considered the matter, so far as concerned conductivity and the dissipation of energy, to be of such trifling practical importance that it sank into insignificance in comparison with considerations of durability, and iron was unfortunately too perishable for the purpose; while, as regards cost, an iron system, if of sufficient size to be fairly lasting, would be dearer than an ordinary copper tape one.

Mr. Hands said that vagaries or freaks of lightning were an impossibility, and the belief in such was due only to the cases being wrongly reported.

Notes on Competitions

Conditions for the New County Hall.

The conditions of the competition for the new County Hall have now been drawn up by the Establishment Committee and put before the Council. It will be recollected that the competition is to be in two stages, a preliminary and a final, there being two assessors in the former (Mr. Norman Shaw and Mr. W. E. Riley, the Council's architect), and three assessors in the latter—Mr. Shaw, Mr. Riley, and a third assessor selected by the competitors in the final competition. Mr. Shaw and the assessor nominated by the competing architects in the final competition will each receive an honorarium of 1,000 guineas, and the competitors in the final competition will receive 200 guineas each. The cost of the building is put at £850,000. The Establishment Committee recommend that the following eight architects be invited to submit designs in the final competition:—Mr. John Belcher, Mr. William Flockhart, Mr. Ernest George, Mr. Henry T. Hare, Mr. T. G. Jackson, Mr. E. L. Lutyens, Mr. E. W. Mountford and Messrs. Nicholson and Corlette. The successful architect will be assigned the work of carrying out the design in conjunction with the Council's architect, the successful architect receiving nine-tenths of the usual commission of 5 per cent. and the Council's architect receiving the remaining one-tenth. The date for sending in designs for the preliminary competition is recommended to be May 7th next, and for the final competition October 3rd next. In the preliminary competition the assessors will select in private not fewer than 10 nor more than 15 designs, and the authors of these will compete with the 8 selected architects in the final competition. Mr. Riley is to have discretionary power in all matters relating to internal economy, building construction and stability.

Clause 13 of the conditions states that "Should the building from any cause not be erected within a reasonable time after the two competitions shall have been held the author of the selected design will be paid at the rate of one-fifth of the commission to be given for his services, the basis being his estimate of the whole cost, such amount to form part of the commission if the building is erected from his design."

The drawings submitted in the preliminary stage will be returned under seal to their respective authors after the award, and successful competitors in the preliminary stage can, if they wish, amend or re-draw their designs for the final stage. Four months—from May to October—are allowed for this. An embankment is to be formed on the site, and competitors will be desired to include in their scheme a design for the superstructure of this embankment wall, which is to be of granite.

Clause 30 of the conditions states that the greatest importance will be attached to simple and convenient planning, and it is essential that all parts of the building should be amply lighted.

Drawings in the preliminary stage are to be one-sixteenth scale, the drawings required being plans of each floor, elevations of the three principal façades, and sections. *No perspective drawings are to be submitted in either stage.* For the final stage additional drawings required will be sections through council chamber and main staircase to one-eighth scale and a detail of a portion of one of the façades. Plans are to be drawn on paper 52ins. by 30ins. and mounted on stainers, and no washes, shading or hatched shadows for the purposes of embellishment will be permitted on elevations, other than flat washes in the openings. When the Council has confirmed these conditions they will be issued to architects.

A 3 Per Cent. Offer.

A Liverpool correspondent sends us the following particulars of a competition for the George Edwards' Memorial Hall, Cefn, Ruabon:—"The neighbourhood is industrial, having a population of 7,000. What is desired is a building to meet the social requirements of the neighbourhood. It is desirable to have a building the holding capacity of which is as great as possible, and one which can also be made suitable for smaller gatherings, such as committees, dinner and dance parties, and billiard-room; this dual function might be carried out by having one spacious hall and 2 or 3 ante-rooms, or a large hall convertible into rooms of a smaller capacity. The committee suggest 800 as the seating accommodation. The total expenditure not to exceed £1,300, inclusive of fees. The outside walls to be faced with seconds red facing bricks. Carnarvon slates to be used. Commission to be offered at 3 per cent for the supply of plans, specifications, details and general supervision. The site is a level piece of ground, having a retaining wall 9ft. high at the back. Entrance from Well Street only. Passage for side entrance next to cottages. Designs to be in by January 12th, 1907. W. R. Jones, Secretary, High Street, Cefn, Ruabon."

List of Competitions Open.

Deposit for conditions given where known.

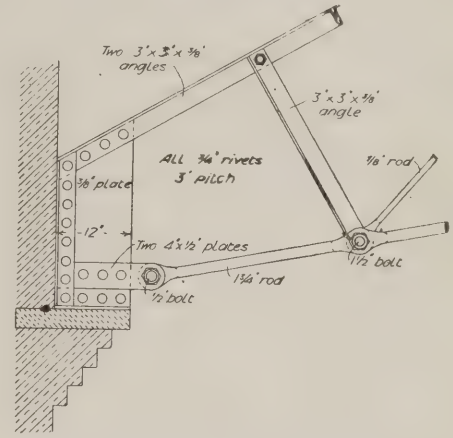
DATE OF DELIVERY	COMPETITION.
Dec. 31	LABOURERS' COTTAGES AT DUBLIN.—Premiums of £50, £30 and £20. Particulars from A. R. Barlas, secretary, L.G.B. Offices, Dublin. No deposit.
Dec. 31	DUAL SECONDARY SCHOOL AT GOOLE.—Premiums £50 and £25. Particulars from James W. Johnson, clerk to Governors, Council Offices, Goole. Deposit £2 2s.
Dec. 31	NURSES' HOME AT GENERAL HOSPITAL, WOLVERHAMPTON.—Particulars from J. Stephen Neil, House Governor and Secretary, General Hospital, Wolverhampton. No deposit.
Dec. 31	BATHS AT ASHTON-IN-MAKERFIELD.—Limited to architects in Wigan and Leigh Poor Law Unions. Particulars from A. Sykes, clerk, Council Offices, Ashton-in-Makerfield. No deposit.
1907 Jan. 5	SECONDARY SCHOOL AT GUISELEY, LEEDS (for 200 scholars).—Name by this date to M. Rennard, secretary to Governers, Guiseley, Leeds.
Jan. 12	LAY-OUT OF RIDDRIE ESTATE, GLASGOW.—Premiums of £75, £50 and £25. Particulars from A. W. Myles, town clerk, City Chambers, Glasgow. No deposit.
Jan. 19	LIBRARY AT PLYMOUTH.—Premiums £50, £30 and £20. MUSEUM AND ART GALLERY AT PLYMOUTH. Premiums £25, £20 and £10. Limited to local architects. Particulars from Borough Librarian, Plymouth.
Feb. 1	CHILDREN'S HOSPITAL AT SUNDERLAND.—Premiums of £100, £50 and £25. Particulars from T. Robinson, secretary, Infirmary Offices, Bank Buildings, Sunderland. Deposit £1 1s.
Feb. 16	CONGREGATIONAL CHURCH, SCHOOL AND MANSE, GRIMSBY.—To cost £8,200. Premiums of 25, 15 and 10 guineas. Particulars from E. L. Bridge, Fish Docks, Grimsby. Deposit £2 2s.

Enquiries Answered.

Boiler-House Roof.

COVENTRY.—PLANT writes: "It is proposed to extend a boiler-house, the existing iron principals to which are fixed at 12-ft. centres. In the proposed extension the chimney stack is partly included, and necessitates the principals being placed 16ft. apart to clear the chimney. Would it be better to continue the principals at 12-ft. centres, as at present, and erect the principal against the chimney stack on a stanchion, or to carry out as suggested by sketch? Also, are there any special measures to be taken in building a wall up to a chimney stack? The stack is 180ft. high."

It will be better to continue the trusses in the same style at the same centre distances, and to shorten the ends of the one opposite chimney shaft, carrying it on a stanchion or upon corbelling from the shaft. The shortened end will be as shown by the illustration below. The wall on each side of the chimney shaft should meet it with a straight joint to avoid any cutting into it that can be avoided, but the walls may be stiffened at the abutting ends by the formation of a pier on the outside.



HENRY ADAMS.

Liability for Drain.

Z. Z. writes: "About 20 years ago we laid the drains to a row of cottages. As the public sewer was not laid in this street at the time the local board allowed us to lay a drain on the owner's ground and connect same to a local board sewer in the next road, and at that time they passed them as sound and satisfactory. Some short time ago the present council condemned these drains and instructed us to relay new drains and connect them to their sewer. Are we liable for this?"

If the facts are correctly stated, the Authority cannot recover payment. If the contention is that the drains were insanitary the Authority can, on the facts being proved, cause such drains to be relaid, but only to the sewer into which they previously discharged. They cannot compel an owner to pay for making connections to a new sewer. See *St. Martin's Vestry v. Ward*, Court of Appeal, November 14th, 1896. In this case both the old drain and the old sewer (at rear of premises) were admittedly defective. The vestry constructed a new sewer in front of premises and gave notice to defendant to drain into it. The defendant refusing, the vestry entered, did the work, and sued for payment. The case was dismissed, both in the lower Court and the Court of Appeal.

Notes and News

Society of Engineers.— Mr. Richard St. George Moore has been elected president of this Society for 1907.

New Parish Council Chambers at Hamilton have been erected at a cost of £3,300. Mr. Alexander Cullen was the architect.

A new Theatre at Cardiff has been erected from designs by Messrs. Runtz and Ford, of London. It was opened by Mr. Beerbohm Tree last week.

At the recent Milan Exhibition Messrs. L. and C. Hardtmuth were awarded the Grand Prix both for their celebrated pencils and for "Waterman's Ideal Fountain Pens."

Correction. — In the pass list for the R.I.B.A. examinations on p. 299 of our issue for last week the name of Mr. F. Waldron in the list of probationers was incorrectly given as "Waldrow."

Prof. W. R. Lethaby has been appointed surveyor of the fabric of Westminster Abbey, in succession to the late Mr. J. T. Micklethwaite, and Mr. Arthur G. Wallace has been appointed assistant surveyor.

The new King's Theatre, Edinburgh, was opened last week. It is in Leven Street, and has been erected from designs by Messrs. James Davidson, F.R.I.B.A., of Coatbridge, and Mr. J. D. Swanston, of Kirkcaldy, joint architects. The cost of the building has been £50,000.

New City Police Buildings.— The Police Committee of the Corporation has approved of a scheme for erecting blocks of buildings in Bishopsgate for the accommodation of married officers and constables of the City police force at a cost of over £16,000. Provision will also be made for an ambulance station in connection with the new electric ambulance system, which the Corporation has adopted.

St. Paul's.— At last week's meeting of the Court of Common Council the Lord Mayor read a statement by Mr. Mervyn Macartney, surveyor of St. Paul's Cathedral, to the effect that no serious subsidence had taken place in the south wall, and that the Dean and Chapter, acting on the advice of their engineer, had given permission to the County Council to construct the proposed deep-level sewer beneath St. Paul's Churchyard.

Model Cottage Exhibitions.— In addition to the model cottage exhibition to be held next year at Walker, Newcastle-on-Tyne (see p. 300 of our issue for last week), a similar exhibition is to be held at Firth Park, Sheffield. Particulars can be obtained from Mr. Henry R. Aldridge, 45, Bank Street, Sheffield.—On an estate of about 400 acres outside Wolverhampton, belonging to Sir Richard H. Paget, a model village is purposed to be established. A development plan has been prepared by Messrs. Detmar Blow and Billerey.

Messrs. Mellowes & Co., Ltd., of Corporation Street, Sheffield, have recently secured the order for glazing on their "Eclipse" patent imperishable system the roofs of extensions to works for Messrs. Hy. Bessemer & Co., Ltd., Cammell, Laird & Co., Ltd., and Samuel Fox & Co., Ltd., at Sheffield; The Staveley Coal and Iron Co., Ltd., near Chesterfield; Greenwood and Batley, Ltd., Leeds; Clark & Co., Ltd., Anchor Mills, Paisley; and lights over the art gallery at Preston.

The Honor Oak Reservoirs, in course of construction for the Metropolitan Water Board were visited on December 8th by the Junior Institution of Engineers. The reservoirs will contain nearly 60,000,000 gallons of water, and will probably be the largest covered reservoirs in the world. The construction generally is of brickwork and concrete, with walls separating the reservoir into four divisions. A middle wall 3ft. thick extends all round the outer walls, and is keyed into the clay. At the centre of the four reservoirs will be the well from which the charging and emptying will be directed. The bricks used have all been made from the excavated clay on the site; 16,000,000 bricks so far having been produced.

The new Stock Exchange at Manchester was formally opened on Wednesday last. The building is in Pall Mall, the exchange hall being at the rear, with main entrance in Norforlk Street. The "House," entrance hall, staircase, &c., are lined with marble, and over the "House," springing from marble columns at the angles, is a large dome, coffered and partly glazed. The internal wood finishings are of mahogany, teak and oak. The secretary's department is arranged in a suite of rooms on the first floor. In addition to the premises set apart for the Stock Exchange, accommodation has been provided for the Union Bank of Manchester as well as numerous suites of offices. The general contractors for the building were Messrs. William Brown & Sons, of Salford, the architects being Messrs. Bradshaw & Gass, of Bolton and London.

A Government Architect for Asylums.— In giving evidence recently before the Royal Commission on the Care of the Feeble-Minded, Mr. Alderman Crowther, chairman of the Asylums Committee for the West Riding of Yorkshire, suggested that new buildings, additions, and alterations to the asylums should be dealt with by a practical Government architect, who should devote the whole of his time to the work, and should be open to be consulted at all times direct, and not through the Lunacy Commissioners. Mr. J. Vickers-Edwards, county architect to the West Riding of Yorkshire, urged the necessity for the establishment of an Architectural Department for Lunacy Building. The principal of it should not be allowed to engage in private practice, and the department should become a separate Governmental Department in the same manner as the Board of Education or the Prisons Department.

Leeds and Yorkshire Architectural Society.—A paper on "Stained Glass" was read before this Society on December 6th by Mr. C. B. Howdill. After referring in detail to the manufacture of glass, both stained and enamelled, and the process of making ecclesiastical figure windows, Mr. Howdill said it was John Thornton, of Coventry, the glass painter of the 15th century, who glazed the great east window of York Minster, and was paid about £900 for a window which, according to modern values, would cost about £2,000. The old craftsmen of the 14th century, however, drove a harder bargain and secured better pay for their work. In the 14th century the rate of pay was 9s. (modern money) per ft. for plain glass and 18s. per ft. for coloured glass. That this was exceedingly good pay is shown by the fact that the cost of such work today would be roughly estimated at from 25s. to 30s. per ft. Some examples of the famous Fairford windows were exhibited by the lecturer, and various phases of modern glass were illustrated, including some by Burne-Jones at Christ Church, Oxford.

The Largest Contract for Spiral Staircases Ever Placed.— The St. Pancras Ironwork Co., Ltd., have carried out for the Underground Electric Railways Co. of London, Ltd., the contract for spiral staircases which have been fixed at all the stations on the Baker Street and Waterloo "tube," the Great Northern, Piccadilly and Brompton "tube," and the Charing Cross, Euston and Hampstead "tube." There are upwards of 40 stations. The staircases are about 18ft. in diameter and vary from 50ft. to 200ft. in height, according to the position of the stations. Treads and landings are covered with a new and improved non-slipping material. The staircases are built entirely of steel, and were specially designed by the St. Pancras Ironwork Co., Ltd., for the railway company. The design involves an entirely new principle in staircase construction, combining great strength with lightness and economy of material, while being of very neat appearance. Besides the staircases, the St. Pancras Ironwork Co., Ltd., have done a large quantity of work for the engineer, in the way of iron doors, steel flooring, &c., and for the architect, Mr. Leslie Green, iron casements, in the way of lights, and doors at many of the stations on all three lines.

SANITARY CONSIDERATIONS IN BUILDING.

A lecture on this subject was delivered before the Edinburgh Architectural Association last week by Mr. James L. Lawrence. He said that one most insanitary piece of construction brought about by the huge blocks of buildings was the inner court or smaller well. The only good point about it, and even this was doubtful, was that they could open their window at any time in the year without fear of a draught. But instead of pure air, they might get a smell of their neighbour's dinner or a concentrated knowledge of the ash bucket in the court below. This, with practically no sunlight and too often the need of artificial light from about November till March, made one hope that planning of this nature would not be long perpetuated. Servants' bedrooms also called for more consideration. How often we saw on a plan an odd, badly-lit room without a fire-place, conveniently designated "boxroom"; a room which was often made to serve the purpose of housing the unlucky servant. People nowadays were not blessed with quite so many boxes as the architect would sometimes make out from the space he allotted to them. Of course, if a fire could not be arranged for, it might also be difficult to put in what the law demanded—a ventilation flue or one that would really do its work; but, if possible, this should be provided, because, after all, how many people did have fires in their bedrooms except in cases of illness? The kitchen was to a great extent a dwelling-room, and special provision in ventilation should be introduced for the comfort of its inmates. No doubt the badly-cooked dinners one sometimes read about were partly occasioned through indisposition of the cook, caused by bad kitchen ventilation.

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New London Buildings

At yesterday's meeting of the London County Council the Building Act Committee reported the following applications under the London Building Act, 1894, their recommendations as to consent or refusal being appended in *italics*:

Formation of certain new streets on a site abutting upon the south-western side of Rosendale Road, Herne Hill. (*Amendment of resolution.*)

Retention of a building at the rear of "Selborne," Leigham Court Road, Wandsworth, on the application of W. Lawrance, on behalf of J. Hill. (*Consent.*)

Buildings on the site of Nos. 321 and 323, Oxford Street, to abut also upon Dering Street, on the application of Gordon & Gunton, on behalf of Hitchings, Ltd. (*Consent.*)

One-storey addition to the Battersea Polytechnic, on the southern side of Lurline Gardens, Battersea, on the application of J. Harwood, on behalf of the governing body of the Battersea Polytechnic. (*Consent.*)

Vestry addition in front of the church of St. Augustine, on the south side of Lynton Road, Bermondsey, on the application of Hesketh & Stokes, on behalf of the Rev. A. E. Lait. (*Consent.*)

One-storey addition at the flank of No. 296, Queen's Road, Deptford, to abut upon Erlanger Road, on the application of A. D. Johnson, on behalf of M. H. Glover. (*Consent.*)

Public convenience on the eastern side of Amersham Road, New Cross, southward of the "Amersham Arms" public-house, on the application of T. Corfield, on behalf of the Deptford Metropolitan Borough Council. (*Consent.*)

Retention of a one-storey addition at the rear of "The Rosemary Branch" public-house, Lewisham High Road, Deptford, abutting upon St. Donatt's Road, on the application of F. J. Eedle & Meyers, on behalf of D. J. Jones. (*Consent.*)

Addition to an office building on the eastern side of Seagrave Road, Fulham, opposite the entrance to Merrington Road, on the application of A. Whitelaw, on behalf of the London and North-Western Railway Co. (*Consent.*)

Retention of a conservatory at the rear of No. 16, Stannard Road, Hackney, abutting upon Ritson Road, on the application of G. Withey. (Consent.)

Projecting shelter in front of the Earl's Court Station of the Metropolitan District Railway Co., Earl's Court Road, Kensington, on the application of C. H. King, on behalf of the Metropolitan District Railway Co. (*Consent.*)

One-storey addition to No. 107, Ringstead Road, Catford, to abut also upon Laleham Road, on the application of H. H. Castle & Co. (*Consent.*)

House on the northern side and two houses on the southern side of Bargery Road, and two houses on the northern side of Inchmery Road, Catford, with the flanks of three of such houses abutting on the western side of Penerley Road, on the further application of Norfolk & Prior, on behalf of J. Watt. (*Consent.*)

Building on a site between Nos. 11 and 13, Portland Place, St. Marylebone, extension of period. (*Consent.*)

Oriel window in front of No. 24, Upper Brook Street, St. George, Hanover Square, on the application of R. S. Wornum, on behalf of S. E. Kennedy. (*Consent.*)

Four electric arc lamps and a projecting sign in front of the London Pavilion Music Hall, Piccadilly Circus, on the application of Wylson & Long, on behalf of the directors of the London Pavilion, Ltd. (*Consent.*)

Projecting fascia in front of a shop on the northern side of Shaftesbury Avenue, Strand, between Rupert Street and Wardour Street, on the application of W. G. R. Sprague, on behalf of J. Jacobus. (*Consent.*)

Two illuminated signs over the public way of Carting Lane, Strand, on the application of Collcutt & Hamp. (*Consent.*)

Porches to seventeen houses on the south-eastern side of Deerhurst Road, Streatham Common North, Wandsworth, southward of Hill House Road, on the application of Cole and Wooding. (*Consent.*)

Retention of a projecting clock in front of Ruskin House, Rochester Row, Westminster, on the application of A. Keen, on behalf of W. Morris & Co. (*Consent.*)

Buildings on the site of Nos. 308 and 310, Uxbridge Road, Hammersmith, to abut also upon Arminger Road, on the application of W. F. Hurndall. (*Refusal.*)

Conservatory addition over the projecting porch in front of No. 13, Hyde Park Gardens, Paddington, on the application of J. Gray, on behalf of J. K. Greig. (*Refusal.*)

Three houses on the southern side of Kensington Place, Kensington, with a forecourt boundary wall in front of such houses, on the application of H. F. Rutter, on behalf of the Metropolitan Water Board. (*Consent.*)

Building on the south-eastern side of a proposed street to lead from Burton Street to Mabledon Place, St. Pancras, on the application of Joseph and Smithem, on behalf of the St. Pancras Metropolitan Borough Council. (*Consent.*)

Erection of Devas Institute on the N.W. side of Thessaly Square, Battersea, to a greater height than the width of Thessaly Square, on the application of H. Howard Batten, on behalf of the trustees of the London Parochial Charities. (*Consent.*)

Retention of a wood and iron structure upon part of the forecourt of No. 19, Filey Avenue, Upper Clapton. (*Consent.*)

Three "cathead" cranes at the premises of Waring & Gillow, Ltd., Castle Street, East Marylebone, on the application of R. F. Atkinson, on behalf of Waring & Gillow, Ltd. (*Consent.*)

Construction and retention of an iron shed on the southern side of Down Place, Hammersmith, on the application of A. Dawkins, on behalf of the London and Westminster Motor Omnibus Co. (*Consent.*)

Building on the south-western side of Draycott Avenue, Chelsea, with a one-storey portion on the space at the rear exceeding 16ft. in height, on the application of Bourchier, Burmester & Galsworthy, on behalf of Miss Cowper Coles. (*Consent.*)

Retention of an addition upon a portion of the space at the rear of No. 18, Handel Street, Bloomsbury, on the application of Johnson & Co. (*Consent.*)

Three dwelling-houses upon a site on the western side of Basil Street, Chelsea, southward of Washington Mansions, with irregular open spaces at the rear, on the application of A. Mitchell, on behalf of Holland & Hannen. (*Refusal.*)

Building on the eastern side of Middlesex Street, Whitechapel, to abut also upon the southern side of Strype Street, and to exceed in height the width of Strype Street, on the application of C. B. Hollish, on behalf of C. and H. Finegold. (*Consent.*)

Re-erection of No. 3a, Hamilton Mews, St. George, Hanover Square, on the application of W. H. Romaine-Walker & Besant, on behalf of B. Lewis. (*Consent.*)

Building on the site of Nos. 132 to 135, Long Acre, to exceed in extent 250,000 cubic ft., on the application of W. Woodward, on behalf of Slatter & Son and W. H. Eastgate. (*Refusal.*)

Formation or laying out of a new street for foot traffic only, to lead from Woodfield Road to Harrow Road, Paddington, and proposed theatre building abutting upon the southern side of Harrow Road and the western side of the said proposed street, on the application of B. Crewe, on behalf of the Paddington Empire, Ltd. (*Consent.*)

Formation of a new street for carriage traffic to lead from Burton Street to Mabledon Place, Euston Road, St. Pancras, on the application of Joseph and Smithem, on behalf of the St. Pancras Metropolitan Borough Council. (*Consent.*)

Coming Events.

Thursday, December 20.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—Mr. Mouchel on "Reinforced Concrete," at 6 p.m.

CHEMICAL SOCIETY.—Meeting at Burlington House, at 8.30 p.m.

Current Market Prices.

FORGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	10	0	1	12	0
Clover, best...	per load	4	7	0	4	17	6
Hay, good	do.	4	0	0	4	5	0
Sainfoin mixture	do.	4	0	0	4	7	6
Straw...	do.	1	8	0	1	14	0

MISCELLANEOUS.

		£	s.	d.	£	s.	d.
Bricks Stocks, d/d to job	per 1,000	1	15	0		—	
Do. Flettons on rail ...	do.	1	5	0		—	
Do. Pressed Wire Cuts, d/d to job ...	do.	1	17	0		—	
Do. Blue brindled wire cuts	do.	1	2	0		—	
Do. do. wire cuts ...	do.	1	6	0		—	
Do. do. pressed facings	do.	1	17	6		—	
Coke Breeze, into carts at gasworks ...	per load	0	2	0		—	
Do. d/d to job	do.	0	4	0		—	
Sand	per yard	0	7	6		—	
Ballast	do.	0	6	6		—	
Granite Chippings ...	do.	0	10	6		—	
Do. do. ¼in. ...	do.	0	11	6		—	
Do. Broken, 1½in. ...	do.	0	15	6		—	
Do. do. 2in. ...	do.	0	15	0		—	
Do. do. 2½in. ...	do.	0	14	6		—	
Cement	per ton	1	12	0		—	
Lime	do.	1	4	0		..	
Glass, English Sheet, in crates of stock sizes, 15oz., 2nds	per sq. ft.	0	0	3½		—	
Do. do. do. do. 3rds.	do.	0	0	2½		—	
Do. do. do. 21oz., 2nds.	do.	0	0	5		—	
Do. do. do. do. 3rds	do.	0	0	3½		—	
Do. do. do. 26oz., 2nds	do.	0	0	6		—	
Do. do. do. do. 3rds	do.	0	0	4¼		—	
Do. do. do. 32oz., 2nds	do.	0	0	8		—	
Do. do. do do. 3rds	do.	0	0	6		—	
Do. English patent plain rolled plate in stock crates ⅛	do.	0	0	2		—	
Do. do. do. 3/16	do.	0	0	2¼		—	
Do. do. do. ¼	do.	0	0	2½		—	
Castor Oil, French ...	per cwt.	1	9	0		—	
Colza Oil, English ...	do.	1	13	6		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	15	0	2	17	0
Lead, white, ground, carbonate	per ton	16	0	0		—	
Do. red	do.	15	0	0	19	0	0
Linseed Oil, barrels ...	per cwt.	1	2	0		—	
Petroleum, American ...	per gal.	0	0	6⅛	0	0	6¼
Do. Russian ...	do.	0	0	5⅝	0	0	5⅞
Pitch	per barrel	0	12	0	0	13	0
Shellac, orange	per cwt.	10	14	0		—	
Soda, crystals	per ton	3	2	6	3	5	0

METALS.

		£	s.	d.	£	s.	d.
Standard Copper	per ton	105	10	0	106	0	0
Do. Strong sheets ...	do.	120	0	0	121	0	0
Lead, soft foreign... ...	do.	19	5	0	19	10	0
Do. English	do.	19	15	0	20	0	0
Do. pipes...	do.	22	5	0	22	10	0
Do. sheets	do.	22	0	0	22	5	0
Galvanised Corrugated sheets	do.	13	15	0	13	17	6
Spelter G. M.	do	27	17	6	28	0	0
Angles, Scotland	do.	6	12	6	6	15	0
Bars, do.	do.	7	15	0	7	17	6
Marked bars, Staffs. ...	do.	8	12	6	8	15	0
Common bars, do. ...	do.	7	5	0	7	10	0
Angles, M'boro.	do.	6	12	6	6	15	0
Joists, M'boro	do.	6	7	6	6	10	0
Angles, Midlands	do.	6	15	0	6	17	6
Joists do.	do.	7	0	0	7	2	6
Girder plates, Midlands ...	do.	7	15	0	7	17	6
Angles, Foreign, c.i.f. Thames	do.	6	17	6	7	0	0
Tees do. do. do.	do.	7	0	0	7	2	6
Joists, do. do. do.	do.	6	5	0	6	7	6
Channels do. do. do.	do.	6	10	6	6	12	6
Plates do. do. do.	do.	7	5	0	7	7	6
Tin, Foreign	do.	196	15	0	197	0	0
Do. English ingots ...	do.	197	0	0	198	0	0
Zinc, sheets, Silesian, f.o.b.	do.	32	0	0	32	5	0
Do. do. V.M. do.	do.	32	5	0	32	10	0

TIMBER.

		£	s.	d.	£	s.	d.
Deals, Archangel, White, 1st, 3×9	per std.	11	5	0	11	15	0
Do. do. do. 2nd, 3×11	do.	11	5	0		—	
Do. do. do. do. 3×9	do.	9	10	0	9	15	0
Do. do. do. 3rd, 3×9	do.	9	0	0		—	
Do. do. Yellow, 2nd, 3×9	do.	14	10	0	14	15	0
Do. do. do. do. 3×8	do.	12	10	0		—	
Do. do. do. 3rd, 3×9	do.	10	0	0	10	5	0
Do. do. do. 4th, 3×11	do.	8	0	0		—	
Do. do. do. do. 3×9	do.	8	5	0		—	
Do. Batskarsnas, Yellow, 3rd, 3×8	do.	7	5	0		—	
Do. do. do. do. 3×7	do.	7	5	0	7	10	0
Do. do. do. do. 3×6	do.	7	10	0	7	15	0
Do. do. do. do. 3×4	do.	7	10	0		–	
Do. do. do. do. 2½×7	do.	8	10	0		—	
Do. do. do. unsorted, 4×8	do.	9	5	0		—	
Do. Kem., Yellow, 3rd, 3×11	do.	8	10	0		—	
Do. Kungsgarden, Yellow and White, 3×9	do.	6	0	0	6	5	0
Do. Mesane, Yellow, 4th, 3×9	do.	8	0	0		—	
Do. do. White, do. 3×9	do.	7	15	0		—	
Do. do. do. do. 3×8	do.	7	10	0		—	
Do. Nederkalix, Dry Yellow, 1st, 4×9	do.	10	15	0		—	
Do. do. Yellow, do. 3×9	do.	10	15	0	11	0	0
Do. do. do. 3rd, 2½×9	do.	8	0	0		—	
Do. Oxelosund & Norrkoping, Yellow, 1st, 4×11	do.	11	15	0		—	
Do. do. do. do. 4×9	do.	11	10	0			
Do. Petschora, Yellow, 4th, 3×9	do.	8	15	0		—	
Do. Riga, White, 3rd & 4th, 3×9	do.	7	0	0		—	
Do. St. Petersburg, Yellow, 3rd, 3×11	do.	7	15	0		—	
Do. do. White, 3rd, 3×9	do.	8	0	0		—	
Do. Storfors, Yellow, 5th, 3×9	do.	7	10	0		—	
Do. do. do. do. 3×6	do.	7	15	0		—	
Battens, Archangel, Yellow, 3rd, 2×11	do.	10	5	0	1)	10	0
Do. do. do. do. 3×9	do.	10	10	0		—	
Do. do. do. 4th, 2×7	do.	8	15	0		—	
Do. do. White, unsorted, 2×8	do.	8	10	0		—	
Do. do. do. do. 2×7	do.	8	10	0		—	
Do. Batskarsnas, Yellow, 3rd, 2½×6	do.	7	5	0		—	
Do. do. do. do. 2×7	do.	7	15	0		—	
Do. do., Yellow and White, 3rd, 2×6	do.	7	5	0		—	
Do. do. Yellow, unsorted, 2×9	do.	9	5	0	9	15	0
Do. do. do. do. 2×5	do.	8	15	0		—	
Do. Gefle, Yellow, 5th, 2×9	do.	8	10	0		—	
Flooring Boards, Fredriksstad, Yellow, 3rd, 1×7	do.	0	9	9		—	
Do. do, Mixed Yellow, 1×6½	do.	0	9	6		—	
Do. do. do. do. 1×6	do.	0	9	6		—	
Do. do. do. do. 1×5½	do.	0	9	0		—	
Do. do. do. do. 1×5	do.	0	9	0		—	
Do. do. do. do. 1×4½	do.	0	8	0		—	
Do. Gothenburg, Yellow, 3rd, 1×7	do.	0	10	0		—	
Do. Mon, Yellow, 2nd, 1×7	do.	0	11	0	0	11	6

Complete List of Contracts Open.

WITH a few exceptions, news of Contracts Open are not repeated after they have been published once in these columns, so that readers will find particulars in our previous issues of other contracts that still remain open.

Unless expressly stated to the contrary, all deposits required for bills of quantities, &c., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair-wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

...**Dec. 20. London, S.W.**—*Erection of 40 "B" type* married soldiers' quarters, Artillery Place, Woolwich, in the Woolwich District. The plans, specification and conditions of contract may be inspected at the office of H. B. Measures, F.R.I.B.A., Director of Barrack Construction, War Office, Atterburn Street, Grosvenor Road, S.W., up to Dec. 20, and bills of quantities and form of tender obtained on the payment of 10s. (not returnable).

Dec. 20. Kilmarnock.—*Demolition of the old buildings* on the site, and for the concrete foundations, of a new post office at Kilmarnock. Drawings, specification, and a copy of the conditions and form of contract may be seen on application to R. Scott & Son, 115, Wellington Street, Glasgow. Bills of quantities and forms of tender may be obtained from W. T. Oldrieve, H.M. Office of Works, Edinburgh, on payment of £1 1s. Tenders must be delivered before Dec. 20, addressed to the Secretary, H.M. Office of Works, &c., Storey's Gate, London, S.W., and endorsed "Tender for Foundations, &c., Post Office, Kilmarnock."

Dec. 21. Belfast.—*Providing and erecting additional fencing* at Carmoney New Burial Ground, in accordance with plan and specification, which may be seen of J. W. Robb, clerk to Belfast Burial District Council, Clerk's Office, Union Workhouse. Sealed tenders to be lodged with him not later that 12 noon on Dec 21.

Dec. 21. Maesteg.—*Re-roofing, re-seating*, and various other works and alterations to Carmel Chapel, Maesteg, for the Trustees. Plans and specifications may be seen at the office of E. W. Burnett, M.S.A., architect, St. Michael's Road, Maesteg, from whom bills of quantities may be obtained upon payment of £1 1s. Sealed tenders, on form which will be supplied, to be sent to the Secretary, J. Jenkins, 13, Bank Street, Maesteg, on or before Dec. 21, and endorsed "Chapel Alterations."

Dec. 22. Oxford.—*Additions to Oxford Diocesan Training College* for Schoolmistresses. Builders desirous of tendering are requested to send their names on or before Dec. 22 to S. S. Stallwood, F.S.A., architect, 27, Market Place, Reading, who will provide bills of quantities, and give all necessary particulars. Plans may be seen either at Polstead House, 23, Banbury-road, Oxford, or at the architect's office in Reading.

Dec. 22. Lichfield.—*Erection of new wards* for the infirm and for children at the Union Workhouse, Lichfield, in accordance with plans prepared by R. J. Barnes, architect, City Chambers, Lichfield. Contractors desirous of tendering are requested to send in their names to Mr. Barnes not later than Dec. 22, together with a sum of £2 2s. Quantities will be forwarded as soon after that date as possible. Plans may be seen at the offices of the architect.

Dec. 22. Callington.—*Erection of a new secondary school* at Callington, for the Cornwall Education Committee, according to plans and specifications which may be seen at the office of J. Sansom, architect to the Committee, Liskeard, from whom all particulars relating to the work may be obtained. Sealed, endorsed tenders on official forms, which may be had from the architect, are to be sent to F. R. Pascoe, secretary, Education Office, Truro, on or before Dec. 22.

Dec. 22. Burnley.—*Erection of proposed technical school* in Omerod Road, Burnley, for the Education Committee. Drawings may be seen and specifications, bills of quantities, and forms of tender obtained at the office of the Borough Engineer, G. H. Pickles, A.M.I.C.E., on payment of £1 1s. Tenders endorsed "Wagon Shed," to be delivered and addressed to the Chairman of the Education Committee, must be delivered at the Town Clerk's Office, Town Hall, not later than 9 a.m. on Dec. 22.

Dec. 26. Talgarth, R.S.O.—*Erection of two semi-detached* cottages on the Brecon and Radnor Asylum Estate. A plan and specification of the work to be done may be seen, and any particulars obtained upon application at the Clerk's Office in the Asylum, any week-day excepting Saturday, between 10 a.m. and 4 p.m. Tenders, sealed and endorsed "Tender for Cottages," must be deliered addressed to A. J. Astbury, clerk to the Visiting Committee, not later than noon on Dec. 26.

Dec. 27. Penygraig.—*Alterations and improvements* to the Old School at Penygraig, for the Rhondda U.D.C. Plans and specifications may be seen and bills of quantities obtained at the office of J. Rees, architect, Hillside Cottage, Pentre, Rhondda, on the deposit of £2 2s. with the Accountant at the Council Offices, Pentre. Sealed tenders (endorsed "Tender for Penygraig School Alterations"), accompanied by the priced quantities under separate cover, must reach T. W. Berry, Director of Education, Council Offices, Pentre, Rhondda, not later than the first post on Dec. 27.

Dec. 28. Doncaster.—*Erection of two shops* in Silver Street, for the Corporation of Doncaster. Specification and form of tender may be had from the Borough Surveyor on payment of £1 1s. Tenders must be delivered at the Borough Surveyor's Office, Mansion House, Doncaster, before noon on Dec. 28, endorsed "Tender for New Shops," and addressed to the Chairman of the Street Improvements Committee.

Dec. 28. Hove.—*Erection of public library* in Church Road, Hove, in accordance with plans, specification and bill of quantities prepared by the architects, P. Robinson, F.R.I.B.A., and W. Alban Jones, of Yorkshire Post Chambers, Leeds. Plans and specification may be seen and bills of quantities, at the office of H. H. Scott, borough surveyor, on payment of £1 1s. Tenders, on forms supplied, endorsed "Tender for Erecting Proposed Library," addressed to H. Endacott, town clerk, Town Hall, Hove, will be received up to 6 p.m. on Dec. 28.

Dec. 28. Ripley.—*Construction of new offices* and public urinal, and also an additional staircase, at the Town Hall, Ripley, Derby, for the Ripley U.D.C. The drawings can be seen, and specification, bill of quantities, and form of tender obtained, from G. W. Bird, C.E., surveyor, Town Hall, Ripley, Derby, upon payment of £2 2s. Sealed tenders, endorsed "Town Hall Alterations," must be delivered at the office of G. M. Capon, clerk to the Ripley U.D. Council, Public Offices, Ripley, Derby, on or before Dec. 28.

Dec. 29. Carmarthen.—*Erection of new workhouse* at Carmarthen. Contractors desirous of tendering are requested to send in, not later than Dec. 8 next, their names and addresses to A. I. Jones, Board's architect, 2, Spilman Street, Carmarthen, together with a cheque for £2 2s. for bill of quantities. Sealed tenders (marked "New Workhouse") must be delivered to J. Saer, clerk to the Guardians, 7, Hall Street, Carmarthen, not later than Dec. 28. The tenders will be opened at the Board meeting on Dec. 29.

Dec. 29. Seacombe Ferry.—*Erection of new ferry workshops* at Seacombe Ferry, for the Wallasey U.D.C. Drawings and specifications may be seen, and form of tender and bill of quantities obtained, on application to W. H. Travers, engineer and surveyor, Public Offices, Egremont, Cheshire, on payment of a deposit of £1. Tenders in sealed envelopes, endorsed "New Workshops, Seacombe Ferry," to be addressed to H. W. Cook, clerk and solicitor, and forwarded through post for delivery at the Public Offices not later than Dec. 29.

Dec. 29. Leicester.—*Erection and completion* of farm buildings at the New Asylum, together with farm bailiff's house, and other works connected therewith, at Narborouvh, near Leicester. Conditions of contract, quantities, and form of tender may be obtained from Everard, Son & Pick, architects, 6, Millstone Lane, Leicester, on payment of a sum of £2 2s. Sealed tenders, upon the forms supplied, to be sent to W. J. Freer, clerk to the Committee of Visitors, 10, New Street, Leicester, not later than 10 a.m. on Dec. 29, addressed to the "Chairman of the Asylum Committee," and endorsed "Tender for Farm Buildings."

Dec. 31. London, S.E.—*Erection of a branch library* at Hither Green S.E. The drawings and specifications of the building can be inspected either at the offices of H. Hopton, architect, 37, Ringstead Road, Catford, S.E., or of C. O. Robson, quantity surveyor, 33, King Street, Cheapside, between 10 and 4. A copy of the quantities can be obtained at the office of the quantity surveyor on payment of £2 2s. Sealed tenders, accompanied by the priced bills of quantities (also sealed), and addressed to the Clerk to the Committee, are to be delivered at the Town Hall, Catford, on or before Dec. 31. Fair wages clause.

Jan. 1. Nottingham.—*Erection of a mixed school* and additions to the infants' school, Sneinton Boulevard, for the City of Nottingham Education Committee. Plans may be seen at, and copies of the specification, bill of quantities, and form of tender obtained from F. B. Lewis, city architect, Guildhall, on payment of a deposit of £2 2s. Sealed tenders, addressed to W. J. Abel, clerk, Education Offices, Victoria Street, to be delivered not later than 10 a.m. on Jan. 1. Fair wages clause.

Jan. 1. Norwich.—*Supply of 160,000 red bricks* equal in all respects to the sample which may be seen of A. E. Collins, M.Inst.C.E., city engineer, Guildhall, Norwich; delivered as, when, and in such quantities as are required, alongside the sewage works in progress between Old Lakenham and Hall Road, Norwich. Tenders, on the forms supplied, enclosed in envelopes sealed with sealing wax, endorsed "Bricks," and addressed to the Chairman of the Sewerage Committee, must be delivered to the City Engineer not later than 10 a.m. on Jan. 1.

Jan. 2. Neston.—*Erection and completion* of a small library at Neston, for the Neston and Parkgate U.D.C. Plans and specifications may be seen and form of tender and bills of quantities obtained upon application to Green, Knowles & Russell, architects, 19, South John Street, Liverpool. A deposit of £1 1s. is required. Sealed tenders, endorsed "Tender for Library," must be delivered to C. E. Senior, surveyor, The Town Hall, Neston, on or before Jan. 2.

Jan. 2. Hambledon.—(*a*) *Carrying out certain small additions* to the young women's dormitory, and (b) the erection of a range of earth closets and the extension of the lavatory accommodation in the men's quarters, at the Union Workhouse, Hambledon, for the Guardians. A plan and specification of the proposed work can be seen on application to E. L. Lunn, Board's architect, 36, High Street, Guildford. Sealed and endorsed tenders are to be delivered to F. Smallpeice, clerk to the Guardians, 138, High Street, Guildford, not later than 2 on Jan. 2.

Jan. 8. Greenland.—*Erection of new Council* school at South Moor, Greenland, for about 950 scholars. Plans, specification, and general conditions of contract may be seen and bills of quantities obtained at the office of Clark & Moscrop, architects, Feethams, Darlington. Sealed tenders, endorsed "South Moor, Greenland Council School Tender," are to be sent on or before Jan. 8, addressed to the Secretary, Elementary Education Department, Shire Hall, Durham.

Jan. 10. Dunning.—*Erection of a police station* at Dunning. The plans and specifications will be seen at the office of D. Smart, architect, Perth, from whom schedules of measurement and further particulars will be obtained, and endorsed sealed tenders must be lodged with D. Marshall, County clerk, County Buildings, Perth, on or before Jan. 10. The police officer at Dunning will point out the site and show copies of the plans to intending contractors.

Jan. 12. Gateshead.—*Erection of additional classrooms*, laboratory, &c., at the Secondary Schools, Durham Road. Plans and specification can be seen and bill of quantities obtained at the office of N. P. Pattison, borough engineer, Town Hall, Gateshead, on payment of £1 1s. Tenders, sealed and endorsed "Tender for Additions to Secondary Schools," to be sent in on or before Jan. 12.

Jan. 14. Gosforth.—*Erection of a new Council school*, to accommodate 400 scholars at Gosforth, near Newcastle-on-Tyne. Contractors desirous of tendering for the work should forward particulars of their name and address to C. Williams, secretary to the Education Committee, Pearl Buildings, Newcastle-on-Tyne, not later than Dec. 20, together with a deposit of £2 2s. Plans of the work may be inspected at the Committee's Offices, and tenders, endorsed "Tender for Gosforth Council School," must be forwarded to the Secretary not later than 3 p.m. on Jan. 14.

Jan. 15. Enfield.—*Erection of a junior mixed school* at Bush Hill Park, Enfield. Applications for bills of quantities should be sent to G. E. T. Laurence, architect, 22, Buckingham Street, Adelphi, W.C., before Dec. 29, from which date the plans and specification can be seen at the above address. A deposit of £1 1s. should accompany the application. Sealed tenders, on the form supplied, must be delivered to N. Hepworth, clerk, Public Offices, Enfield, free of charge, not later than 12 noon on Jan. 15. The contractor whose tender is accepted will be required to enter into a bond with two sureties in the sum of £300 each for the due performance of the contract.

Jan. 17. London, S.E.—*Alterations and additions at the Infirmary*, Lower Road, Rotherhithe, S.E., according to plans and specification prepared by A. H. Newman, and quantities by W. T. Farthing & Son. Persons desirous of tendering for the works are required to send their names and addresses before Dec. 8 to E. P. Fenton, clerk to the Guardians, 283, Tooley Street, S.E., and to deposit with him a £50 Bank of England note. As soon after Dec. 8 as possible, forms of tender, bills of quantities, etc., and all other necessary information will be supplied to those persons whose names, addresses, and deposits have been supplied to the Clerk to the Guardians. The specification and plans of the works will then be open for inspection by such persons at the architect's offices, A. H. Newman, 31, Tooley Street, London Bridge, S.E., on production of the form of tender. Fair wages clause. Sealed tenders, endorsed "Tender for Alterations and Additions, Infirmary," must be delivered personally to E. P. Fenton, clerk, 283, Tooley Street, S.E., at 6 p.m. on Jan. 17, accompanied by the bills of quantities, &c., in a separate sealed envelope. The tenders will be opened and considered at 7 p.m. at the meeting of the Guardians on Jan. 17, at their Board Room, at which place, date, and time a responsible member of the firm tendering must be in attendance.

Jan. 22. Eltham.—*Erection of a refreshment house* at Avery Hill, Eltham, for the L.C.C.. Full particulars and also information as to the conditions to be observed by tenderers, will be given in the "London County Council Gazette" of Dec. 17, which can be obtained from P. S. King & Son, 2 and 4, Great Smith Street, Westminster (price 1d., post free 1½d. a copy). Tenders must be upon the official forms, and no tender will be received after 10 a.m. on Jan. 22.

April 2. Bombay.—*Construction of a reclamation* between Mazagon and Sewri, for the Trustees of the Port of Bombay. The contract will include the building of a rubble masonry quay wall about 12,600ft. long on piled foundations and the reclamation of about 518 acres of the foreshore; such reclamation to be effected by silt or mud pumped or dredged from the bed of the harbour, and covered with a layer of good earth. Copies of the specifications and drawings of the work can be obtained from the Chief Engineer, Bombay Port Trust, Ballard Road, Bombay, or from Sir J. Wolfe Barry and A. J. Barry, trustee's consulting engineers, 7, The Sanctuary, Westminster, S.W., on payment of £5 sterling. Tenders, which must be endorsed "Tenders for Mazagon-Sewri Reclamation," and accompanied by a deposit of Rs. 10,000 (£666), will be received by the Secretary, Bombay Port Trust, Bombay, up to 5.30 p.m., or by the Trustees' Consulting Engineers up to noon on April 2.

No date. Bridlington.—*Erection of a theatre* on the New Spa, Bridlington. Persons desirous of tendering are requested to send in their names to F. Lowther & Walker, architects, York Chambers, 71, Lowgate, Hull, together with a deposit of £2 2s. Bills of quantities and further particulars will be sent to such depositors only.

ENGINEERING.

Dec. 21. Derby.—*Erection of new electric power station*, Silk Mill Lane. Plans may be seen, and form of tender, specification, and bill of quantities obtained, on application at the office of J. Ward, M.Inst.C.E., borough surveyor, Babington Lane, Derby, and upon the deposit of £1 1s. Tenders, endorsed "Power Station," are to be delivered in the special envelope provided for the purpose at the office of G. T. Lee, town clerk, Town Clerk's Office, 15, Tenant Street, Derby, not later than 10 a.m. on Dec. 21.

Dec. 22. Guernsey.—*Construction of the proposed extension* of the pier and causeway in Bordeaux Harbour, The Vale. Plans and specifications may be seen, and forms of tender and other information obtained, on application to J. H. Duquemin, States engineer, States Office, Guernsey. Sealed tenders, addressed to J. N. Brouard, supervisor, and endorsed "Tender for Bordeaux Pier Extension," must be delivered so as to reach the State Office on or before Dec. 22, at noon.

Dec. 22. Stockport.—*Electric light wiring and telephones* in connection with the new Town Hall, in accordance with specifications and schedules prepared by A. B. Thomas, architect, 5, Queen Anne's Gate, Westminster, S.W. Copies of the particulars for tender can be obtained of R. Hyde, town clerk, Town Clerk's Office, Stockport, or at the offices of the architect, on payment of a deposit of £1 1s. for each separate list. Tenders must be delivered to R. Hyde not later than noon on Dec. 22. Fair wages clause.

Dec. 22. Porthcawl.—*Construction of a concrete sea defence wall* at the Esplanade, Porthcawl, in length 216 lineal ft., or thereabouts, for the U.D.C., according to the plans and specifications prepared by R. W. Jones, the Council's engineer, which are deposited and may be inspected at the Council Offices, Porthcawl, by appointment with the said Engineer. Copies of specification and form of tender will be supplied to intending contractors upon receipt of £2 2s. The contractor whose tender shall be accepted shall enter into a contract and also a bond with two sureties in the form required by the Council and pay the cost of the same, not exceeding six guineas. Tenders, marked "Esplanade Sea Wall Extension," are to be sent to E. T. David, clerk to the above-named Council, Council Offices, Porthcawl, on or before Dec. 22.

Dec. 31. Brackley.—*Sinking a well* in the Borough of Brackley. Specification and forms of tender may be obtained and plans seen at the office of the Town Clerk at Brackley, and information and any further particulars may be obtained on application to J. Eunson, C.E., Northampton. Copies of specification may be obtained on payment of £2. Tenders, upon the forms supplied, must be delivered not later than 10 a.m. on Dec. 31, addressed to C. E. Barnes, town clerk, endorsed "Tender for Well."

Dec. 31. Ashton-under-Lyne.—*Construction of an embankment*, &c., for the formation of a reservoir, and for other works on and about the Chew Brook, 3½ miles or thereabouts from the Friezland Station of the London & North-Western Railway, for the Joint Committee of the Ashton-under-Lyne, Stalybridge, and Dukinfield (District) Waterworks. Drawings can be seen and copies of the specification, schedule, and form of tender may be obtained at the offices of G. H. Hill & Sons, civil engineers, Albert Chambers, Albert Square, Manchester, and 3, Victoria Street, Westminster, upon receipt of cheque for £5 5s. Sealed tenders, endorsed "Tender for Chew Reservoir and Works," must be addressed to and forwarded to W. H. Rothwell, secretary to the Joint Committee, Town Hall Chambers, Ashton-under-Lyne, on or before Dec. 31.

Jan. 1. Bray, Ireland.—*Supplying and erection of a high-tension* switchboard and instruments. Specification and form of tender may be obtained from W. J. U. Sowter, A.M.I.E.E., electrical engineer to the Council, on payment of a deposit of £2 2s. Tenders, sealed and endorsed "Switchgear," to be delivered to P. MacDonnell, clerk to the Council, Town Hall, Bray, Ireland, not later than 10 a.m. on Jan 1.

Jan. 3. York.—*Construction of the Selby and Goole Railway*, about 10 miles in length, for the North-Eastern Railway. The works comprise double-line railways chiefly on embankment (upwards of 1,000,000 cubic yards), with stations, station yards, warehouses, cottages, and other buildings, sidings, and bridges. The steelwork of the latter will amount to about 1,100 tons. Plans may be seen, and specification, detailed quantities, and form of tender obtained, on personal application at the office of W. J. Cudworth, Company's engineer, York. Sealed tenders, marked "Tender for Selby and Goole Railway," to be addressed to R. F. Dunnell, secretary, and delivered at his office at York not later than noon on Jan. 3.

Jan. 9. Worthing.—*Sinking a well* 115ft. deep, lined with iron cylinders, and the driving of headings and other works in connection therewith, for the Corporation. Plan and specification may be seen and form of tender obtained on application to F. Roberts, A.M.Inst.C.E., borough water engineer and surveyor. Sealed tenders, endorsed "Tender for Well," to be sent in to W. Verrall, town clerk, Municipal Offices, Liverpool Road, Worthing, not later than 12 noon on Jan. 9.

Jan. 10. Swansea.—*A two-ton portable high pedestal* hydraulic crane with a radius of 40ft., for the Swansea Harbour Trustees. Further particulars can be obtained on application to A. O. Schenk, Mem.Inst.C.E., Trustees' engineer, at the Harbour Offices, Swansea. Tenders, sealed and marked "Hydraulic Crane," should be delivered to T. Strick, clerk, Harbour Offices, before 10 a.m. on Jan. 10.

Jan. 16. Spain.—*Construction of an iron bridge* over the river Arevalillo, on the road from Villacastin to Vigo, at the estimated cost of 56,975 pesetas (about £2,071). Tenders will be opened on Jan. 16 at the Directorate General of Public Works, Madrid. Plans and specifications are on view at the above-mentioned office; conditions of tender are set forth in the "Gaceta." Local representation is necessary. The "Gacetas" may be seen at the Commercial Intelligence Branch of the Board of Trade, 73, Basinghall Street, E.C.

Jan. 19. Bridlington.—*Supply and erection of two sets* of deep-well pumping machinery, to be driven by steam, suction gas, or electricity, for the Corporation. Copies of specification, forms of tender, and permits to view the site, may be obtained of A. E. Matthewman, town clerk, Town Hall, Bridlington, on payment of £2. Tenders, endorsed "Tender for Pumping Machinery," are to be addressed to the Chairman of the Waterworks Committee and delivered at the Town Clerk's Office not later than Jan. 19.

IRON AND STEEL.

Dec. 24. Nottingham.—*Supply and fixing* of about 147 lineal yds. of three-rail wrought iron unclimbable hurdle fencing and gates at the foot of the Castle Rock, Castle Boulevard, for the Castle Museum and School of Art Committee. Plans may be seen and copies of the specification and form of tender obtained from F. B. Lewis, city architect, Guildhall, on payment of a deposit of £1 1s. Sealed tenders to be sent in not later than 10 a.m. on Dec. 24, addressed "The Town Clerk, Guildhall, Nottingham," and endorsed "Tender for Hurdle Fencing, Castle Boulevard." Fair wages.

Jan. 7. Beckenham.—*Supply of about 250 lin. yds.* of W. I. unclimbable fencing, 6ft. high, together with ornamental entrance gates, for the U.D.C. Specifications and forms of tender obtained on application to J. A. Angell, surveyor, on the production of a receipt from the Collector (who attends his office, daily from 9 to 10 a.m. only, except on Tuesdays, when his hours are from 9 a.m. to 1 p.m.), for a deposit of £1. Tenders, duly sealed and endorsed "Tenders for Railings and Gates," to reach F. Stevens, clerk to the Council, not later than 4 p.m. on Jan. 7.

ROADS AND CARTAGE.

Dec. 20. London, S.E.—*Supply of 5,000ft. of 8-in. by 12-in.* grey Norwegian edge straight kerb and 500ft. of 8-in. by 12-in. Norwegian circular kerb of various radii, for the Lambeth Borough Council, to be delivered as directed to either of the Council's depôts at St. James's Road, Brixton; Fenwick Place, Stockwell, or Cobbett Street, Clapham. Further information, if required, may be obtained upon application to the Borough Engineer at No. 346, Kennington Road, S.E., any weekday, between 10 and 12 noon, from whom forms of tender can also be obtained. Sealed tenders, endorsed "Tender for Norwegian Kerb," to be delivered at the Town Hall, Kennington Green, London, S.E., not later than 12 noon on Dec. 20.

Dec. 20. Plymouth.—*Construction of a new joint road*, including surface water drains, sewers, manholes, and other works, on the Antony and Carbeile Building Estates, Torpoint. Contractors are requested to send their names to either W. J. Carder, surveyor to the Antony Building Estate, 24, Lockyer Street, Plymouth, or R. M. Luke, surveyor to the Carbeile Building Estate, 15, Princess Square, Plymouth, on or before Dec. 20.

Dec. 24. Cardiff.—*Private street improvement works* in Brook Lane, Ely, in accordance with specification, which may be seen, and bills of quantities obtained on application to J. Holden, A.M.I.C.E., surveyor, Park House, 20, Park Place, Cardiff. The person whose tender is accepted wil be required to enter into a contract (the draft of which is attached to the specification) and to give a bond, with two approved sureties, for the due performance of the contract. Tenders, sealed and endorsed, to be sent to M. Warren, clerk, Park House, Cardiff, not later than 12 noon on Dec. 24.

Dec. 27. Leeds.—*Paving and flagging* of Lucas Place, Back Lucas Street, and Back Hartley Grove. Drawings may be seen at the City Engineer's Office, Municipal Buildings. Forms of tender and bills of quantities may be obtained, and copies of the documents forming the contract inspected, on application at the Highways Office, 155, Kirkstall Road. Sealed tenders, endorsed "Tender for Private Street Works," and addressed to the Highways Committee, must be delivered at the Town Clerk's Office, Town Hall, Leeds, not later than 10 a.m. on Dec. 27.

Dec. 27. London, N.E.—*Executing tar and wood block pavings*, erection of terrace wall and entrance gates, and sundry other works at the Children's Homes at Chipping Ongar, Essex. The specification, conditions of contract, and plans may be seen of F. R. Coles, clerk to the Guardians, Clerk's Offices, Hackney Union, Homerton, N.E., by persons desirous of tendering, and bills of quantities and form of tender will be furnished upon deposit with him of the sum of £1 1s. The contractor will be required to give approved security for the due performance of the contract in a bond, the form of which may be seen at the above office. Sealed tenders, endorsed "Pavings, Building, &c., at Ongar," must be delivered not later than 2 p.m. on Dec. 27.

Dec. 31. Leyton.—*Making-up, kerbing, and paving* certain private streets within the district, for the U.D.C. The paths are to be paved with Patent Victoria Indurated and Patent Aberdeen Adamant Stone, and certain passageways are to be paved with blue Staffordshire paving bricks Specification, quantities, and form of tender may be obtained on application to W. Dawson, M.I.C.E., Council's surveyor, Town Hall, Leyton, between 10 and 4 (Saturdays 10 and 12). Sealed tenders in special endorsed envelopes supplied with the forms, must be delivered at the meeting of the Council to be held on Dec. 31, at the Town Hall, Leyton, at 7 p.m.

Jan. 3. Banchory.—*Macadamizing, &c.*, of 859 lineal yds. or thereabouts of streets within the burgh, including channels, kerbing, gullies, footways, and crossings thereon. The Burgh Road Surveyor will meet intending offerers at Viewmount Road (west end), on Dec. 29, at 1.30 p.m., to point out the works. Specifications may be seen at the office of J. Merson, town clerk, High Street, Banchory, where tenders should be lodged not later than Jan. 3.

Jan. 5. London, W.—*Paving with wood of* Clifton Gardens, the portion of Warwick Avenue in front of St. Saviour's Church, a portion of Porchester Gardens, and a portion of Amberley Road opposite the schools there, for the Paddington Borough Council. Printed conditions, specification, and form of tender and further particulars may be obtained upon application between 10 a.m. and 4 p.m. (Saturdays 10 a.m. and 1 p.m.) at the office of, or by letter addressed to, the Borough Surveyor, Town Hall, Paddington, W. No tender will be considered unless made strictly in accordance with and on one of the printed forms issued, and it must be sealed, endorsed according to the description of contract, addressed to the Town Clerk, and delivered at the Town Hall, Paddington, W., on or before Jan. 5.

Jan. 7. Batley.—*Levelling, paving, flagging*, and completing of each of the following streets:—Borough Road, Fleece Street, Cooper Street, Ambler Place, Fox Place. Plans, sections, specifications, and conditions of the said works respectively may be seen, and forms of tender, together with schedules of quantities and other particulars, obtained at the office of O. J. Kirby, borough engineer, Town Hall, Batley. Sealed tenders, on the forms provided, endorsed "Tender for ——," to be delivered to J. H. Craik, Town Clerk's Office, not later than Jan. 7.

Jan. 8. London, N.—*Roadwork and platelaying* required by the L.C.C., for the reconstruction for electric traction on the conduit system of its existing tramways in Holloway Road, City Road, and Hackney Road; and on the overhead trolley system of the portion of the existing tramways in Bow Road, within the Borough of Poplar. The total length of the above-mentioned lines is about 9¾ miles of single track, of which about 8¼ miles single will be reconstructed on the conduit system. Full particulars and also information as to the conditions to be observed by tenderers will be given in the "London County Council Gazette" of Dec. 10. The "Gazette," which is published weekly, contains particulars of all tenders invited by the Council, and can be obtained from P. S. King & Sons, 2 and 4, Great Smith Street, Westminster, S.W., price 1d., post free 1½d., an issue, or for the year a prepaid subscription of 6s. 6d. Tenders must be upon the official forms to be obtained from the Chief Engineer, County Hall, Spring Gardens, S.W., and no tender will be received after 10 a.m. on Jan. 8.

SANITARY.

Dec. 26. Littlehampton.—(*1*) *The construction of a screening chamber* on the Workhouse main drain; (2) the erection of a covered way; (3) the erection of boundary walls and fences, and making-up grounds, for the Guardians of the East Preston Union. Plans and specifications may be seen of H. M. Potter, architect, 41a, Warwick Street, Worthing. Tenders, endorsed "Tender for Covered Way, &c.," must reach A. Shelley, clerk, Town Offices, Littlehampton, not later than Dec. 26.

Jan. 2. Ashwell.—*Sewerage works* for the Parish of Ashwell. The works comprise about 2½ miles of stoneware pipes (chiefly 12-in. and 9-in.), with manholes and other appurtenant works; also small sedimentation tanks, and laying-out 9 acres of land for filtration. Plans and specifications can be seen at the offices of Elliott and Brown, engineers, Burton Buildings, Parliament Street, Nottingham, and copies of the bill of quantities and form of tender obtained on deposit of £2 2s. (by cheque). Sealed and endorsed tenders to be delivered to A. Sharpe, clerk to the Council, Royston, Herts, on or before the first post on Jan. 2.

Jan. 13. Kettering.—*Provision of distributing apparatus*, on rectangular percolation filter beds, for the U.D.C. Full particulars of requirements may be obtained from the Council's Surveyor. Tenders to be delivered at the office of T. R. Smith, engineer and surveyor, Surveyor's Office, Market Place, Kettering, not later than Jan. 13.

Jan. 14. London, E.—*Supply of stoneware sewer* and drain pipes, &c., iron casings for sewerage and drainage works, for the Metropolitan Borough of Poplar. Forms of tender, specifications, and all particulars may be obtained on application to H. Heckford, A.M.I.C.E., borough surveyor, at the Council Offices, on payment of a deposit of £1 1s. in cash. Tenders, endorsed with the description of work tendered for, to be delivered to L. Potts, town clerk, Council Offices, High Street, Poplar, on or before noon on Jan. 14. Fair wages clause.

Jan. 22. Sowerby Bridge.—*Supply, delivery, and filling* the remaining 12 bacteria beds with filtering medium; quantity about 9,000 cubic yds., at the Sewage Works, Milner Road, Sowerby Bridge. for the U.D.C. Conditions and samples of filtering medium, &c., may be seen at the Engineer's Office, Hollings Mill Lane, Sowerby Bridge, by appointment. Specification and quantities may be obtained on application to C. L. Whitehead, C.E., M.E., engineer, Sowerby Bridge, on payment of a £5 Bank of England note only. Tenders, endorsed "Bacteria Beds," and addressed and delivered to R. W. Evans, clerk and solicitor to the Council, Commercial Bank Chambers, Halifax, in sealed envelopes, not later than Jan. 22.

Jan. 30. Weaste.—*New sewage pumps* to two large pumping engines at the Salford Sewage Works, Weaste. Drawings and specifiations may be obtained from the Borough Engineer, Town Hall, Salford, on payment of £1. Tenders, endorsed "Sewage Pumps," and addressed to "The Chairman of the Rivers Committee, Town Hall, Salford," must be delivered to L. C. Evans, town clerk, Town Hall, Salford, not later than 12 noon on Jan. 30.

MISCELLANEOUS.

Dec. 20. Nottingham.—*Supply of the following goods* and materials for delivery during the ensuing year, carriage paid, at the various gas stations, chemical works, or stores, or at any railway station within the Nottingham gas supply district, for the Gas Committee:—(a) Cast-iron pipes and specials; (b) pig lead, lead and compo. pipe, white, red, and chemical sheet lead; (c) wrought-iron and steel; (f) wrought-iron tubes and fittings; (g) brass cocks and malleable iron levers (h) small iron castings, retort fittings, &c.,; (i) purchase of old cast and wrought scrap iron, old copper, brass, &c.; (k) paints; (l) oils. Specifications and forms of tender may be obtained, and samples seen, on application to the Engineer and General Manager, at the Gas Offices, George Street, Nottingham. Tenders to be addressed to S. G Johnson, town clerk, and delivered at the Guildhall, Nottingham, not later than Dec. 20.

Dec. 29. Bury.—*Supply and delivery* of the following materials:—Tramway rails and fishplates; tie-bars, fish bolts and nuts; points and crossings; sole or anchor plates; copper rail bonds; granite setts; cement. Specifications and bills of quantities, with forms of tender, can be obtained on application at the office of A. W. Bradley, A.M.I.C.E., borough engineer and surveyor, on payment of £2 for each specification. Sealed tenders, endorsed "Tramway Rails, &c.," or as the case may be, are to be forwarded to J. Haslam, town clerk, Municipal Offices, Bank Street, Bury, and addressed to the Chairman of the Tramways Committee, so as to be received not later than Dec. 29.

Jan. 7. London, S.W.—*Execution of works* and the supply of materials from March 31 next, for one, two, or three years, as per forms of tender, at the option of the Council, for the Council of the Metropolitan Borough of Wandsworth:—(1) artificial stone; (2) blue bricks; (3) castings, &c.; (4) cement; (9) granite kerb and setts; (10) gravel and flints; (12) hire of steam road-rollers and scarifiers; (15) iron bars and other materials for blacksmith's work; (16) lime, bricks, &c.; (24) slag or scoriæ paving blocks; (25) stoneware pipes, &c.; (27) tar-paving works and materials; (28) Thames ballast and sand; (29) timber. Fair wages clause. Specifications and forms of tender may be obtained and form of contract seen of H. G. Hills, town clerk, Council House, Wandsworth, S.W., between 10 a.m. and 4 p.m. (Saturdays 10 till 1). Tenders (each enclosed in a separate envelope) are to be delivered, under seal, at the Council House, endorsed "Tender for ——," on or before Jan. 7. No tender will be received unless it is made upon one of the printed forms issued from these offices.

Dec. 28. Dublin.—*Construction of about 14 miles of pipe sewers*, ejector stations, rising mains, air transmission mains, air-compressing station, together with the supply and erection of various machinery and auxiliary works connected therewith, chiefly in the East Clontarf and West Clontarf Wards of the City of Dublin. The drawings, specification, bills of quantities, and forms of tender may be inspected at the office of the City Engineer, City Hall, Dublin, and at the office of G. Chatterton, M.Inst.C.E., consulting engineer, 6, The Sanctuary, Westminster, between 10 a.m. and 5 p.m. daily, Saturdays excepted, and a limited number of copies of the said documents may be obtained at the offices aforesaid on payment of the sum of £5 5s. (Crossed cheques only will be received in payment.) Tenders, sealed and endorsed on the envelope "Tenders for Clontarf Sewerage," must be addressed to the Chairman of the Improvements Committee, City Hall, Dublin, and delivered before 12 noon on Dec. 28. With each tender must be submitted the names of two sureties who will be prepared to execute a joint and several bond for the due performance of the contract in a sum of £10,000.

TOO LATE FOR CLASSIFICATION.

Dec. 20. Paddock.—*Erection of eight dwelling-houses* in Branch Street, Paddock. Plans may be seen and quantities obtained of Lunn & Kaye, architects and surveyors, Milnsbridge. Sealed and endorsed tenders must be delivered to them not later than 5.30 p.m., free of charge, on Dec. 20.

Dec. 21. Valetta.—*Supply of stoneware pipes and specials.* Sealed tenders will be received at the office of the Receiver-General and Director of Contracts, Valetta, up to 11 a.m. on Dec. 21. Tenders are to be accompanied with a deposit of £50, to be made in the office of the Crown Agents by tenderers residing in Great Britain not having a representativeg in Malta, and in the office of the Receiver-General by local tenderers. Contract fees to be paid by the contractor. Particulars, specification, &c., may be obtained on application to W. Casolani, Receiver-General and Director of Contracts, or to the Crown Agents for the Colonies, Whitehall Gandens, London.

Dec. 21. Sedgefield.—*Execution of a scheme of main sewerage* and sewage disposal for Bishop Middleham, for the Sedgefield R.D.C. The proposed works in this contract comprise the furnishing and laying of about 2,200yds. of 12, 9, 8, 7, and 6-in. fireclay and cast-iron pipe sewers with Gaskin and cement joints, with manhole and lamphole shafts, storm overflow and screening chambers, bacterial tanks and filters, fencing, cart-road, &c. Contractors desirous of tendering are requested to send their names and addresses not Tyne, accompanied by a cheque for £3. after which engineers, 3, St. Nicholas Buildings, Newcastle-on-Tyne, accompanied by a cheque for £3, after which ful partilculars and quantities will be forwarded. The engineers will arrange in due course to locally meet the intending contractors and go over the route of the said works and explain plans and specification. Sealed tenders, endorsed "Tender for Bishop Middleham Sewerage," must be sent to J. W. Lodge, clerk, Union Offices, Sedgefield, Ferryhill, not later than 10 a.m. on Dec. 21.

Dec. 28. Dublin.—*Supply of 320yds. of wrought-iron railings* to enclose Recreation Ground at Dollymount, for the Improvements Committee. The railing are to be made and supplied in 6-ft. sections, having round iron bars passed through horizontal bars and rivetted underneath, in accordance with the design prepared by the City Engineer, copy of which, with a full memorandum of particulars, can be had on application to P. Tobin, secretary, any day between 11 and 4; Saturdays 11 and 1. Tenders, addressed to the Chairman, Improvements Committee, City Hall, and endorsed "Tender for Wrought-Iron Railings," must be received by the Secretary not later than Dec. 28, at or before 12 noon. Fair wages clause. The railings shall be of Irish manufacture.

Dec. 28. Warwick.—*Erection of a workshed at* the Workhouse, Warwick, according to plan and specification, which may be seen at the office of F. P. Trepess, F.I.A.S., 1, Church Street, Warwick, any day (except Saturday) between 10 a.m. and 4 p.m. Tenders, sealed and endorsed "Tender for Workshed," addressed to C. H. Passman, clerk to the Guardians, 48, Bedford Street, Leamington Spa, must be delivered not later than 9 a.m. on Dec. 28.

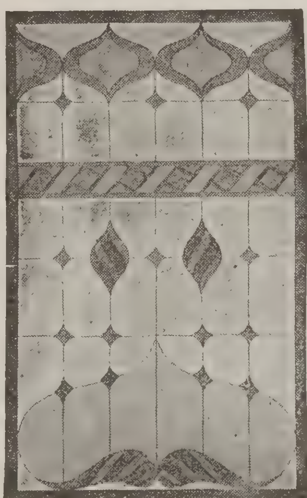
Dec. 29. Melton Mowbray.—*Construction of a girder bridge*, with brick abutments, iron palisading, and road metalling, &c., complete, over the Scalford Brook, from Regent Street to Brook Street, for the U.D.C. Plans and specifications may be seen at the office of E. Jeeves, surveyor to the Council, Nottingham Street, Melton Mowbray, and applications for quantities and particulars of tendering must be sent to him not later than Dec. 29.

Dec. 31. Stockton.—*Re-seating of the Board-Room*, for the Guardians of the Stockton Union. Full particulars and forms of tender to be obtained from J. Rodham, 16, Finkle Street, Stockton-on-Tees. Tenders duly endorsed "Tender for Re-seating," to reach F. B. Watson, clerk to the Guardians, Stockton-on-Tees, not later than Dec. 31, at noon.

Dec. 31. Wemyss.—*Erection of new school* at East Wemyss. Schedules of quantities may be obtained from A. W. Taylor, clerk to the School Board, on the depositing of £1 1s. Sealed offers to be lodged with the Clerk to the Board, East Wemyss, not later than 10 a.m. on Dec. 31, marked "Tender Wemyss School."

Jan. 2. Epping.—*Construction of sewage disposal works* and the laying of about 2,500 yds. lineal of pipe sewers, with manholes and contingent works in the parish of Chigwell, for the Epping R.D.C. Drawings can be seen, and further particulars and bills of quantities obtained, at the office of H. Tooley, A.R.I.B.A., Buckhurst Hill, upon the deposit of £10. Applications for bills of quantities must be made before Dec. 19. Tenders to be on the forms supplied, and sent in the envelopes provided, to R. D. Trotter, clerk, Epping, Essex, on or before 6 p.m. on Jan. 2.

Jan. 18. Wallsend.—*Erection of police buildings.* Persons desirous of tendering are requested to send in their names to J. A. Bean. Bills of quantities will be forwarded on payment of a deposit of £2 2s. Applications to be sent to J. A. Bean, County architect, The Moot Hall, Newcastle-on-Tyne, where drawings can be seen. Sealed tenders, sent in the envelopes provided, to be delivered not later than 4 p.m. on Jan. 18.



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Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, *Great New Street, Fetter Lane, E.C.*

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Accrington.—For the erection of an engine and boiler house at Altham Bridge, for the Accrington District Gas and Water Board. Messrs. Haywood and Harrison, architects Accrington:—

W. Griffiths, Great Harwood	£8,365	0	0
H. Fairclough, Warrington	7,369	0	0
E. Lewis & Son, Blackburn	6,855	0	0
J. Grimshaw, Church	6,826	0	0
T. Lightbown, Darwen	6,700	0	0
J. Crake, St. Helens	6,630	0	0
J. Whittaker & Son, Blackburn	6,590	0	0
J. Byrom, Ltd., Bury	6,436	0	0
C. Lomax, Ltd., Ramsbottom	6,324	0	0
J. Cronshaw, Blackburn	6,270	0	0
T. Knowles, Darwen	6,250	0	0
T. Higson & Son, Blackburn	6,199	0	0
H. Ramsbottom, Accrington	5,960	0	0
R. Neill & Sons, Manchester	5,686	0	0
J. Gerrard & Son, Swinton, Manchester	5,453	0	0
G. Cunliffe & Sons,* Accrington	5,449	7	6

*Accepted.

Ashington (Northumberland).—Accepted for the erection of new Council school, for the Northumberland Education Committee. Mr. G. Topham Forrest, architect to the committee. Quantities by Messrs. J. P. Allen and Partners, Newcastle-on-Tyne:—

R. Carse & Son, Amble	£8,017	13	10

Note.—Twenty-one tenders.

Bolton-on-Dearne (Yorks).—For the erection of sewerage works. Mr. W. H. Radford, C.E., engineer, Albion Chambers, Nottingham:—

Greaves & Wheater, Leeds	£9,200	0	0
Allott, Cook & Heywood, Huddersfield	8,100	0	0
Gates & Hogg, Barmborough	8,041	16	5
S. C. Boul, Sheffield	7,819	4	6
Edmondson & Wyatt, Oldham	7,685	0	0
S. Hamilton, Goldthorpe	7,640	0	0
Jowett Bros., Liverpool	7,286	18	0
Jones Bros., Stairfoot	7,200	0	0
J. Cooper, Rotherham	7,070	9	2
J. Moran, Sheffield	7,050	0	0
I. Dean & Co., Manchester	6,995	0	0
Parker & Sharp, York	6,778	11	10
W. Johnson, Wombwell	6,719	0	0
W. Thornton & Son, Rotherham	6,689	0	0
J. C. A. Moffatt, Manchester	6,622	15	7
A. J. Cottle, Rotherham	6,600	0	0
J. Mackay, Dundee	6,599	0	5
E. Taylor, Blackpool	6,480	6	10
Fletcher, Hann & Fletcher, Goldthorpe	6,459	17	3
R. W. Blackwell & Co., London	6,433	2	11
E. Bentley & Sons, Leicester	6,377	7	9
J. H. Wood, Leeds	6,375	0	0
W. H. Hill, Skegness	6,340	0	0
B. Firth & Co., York	6,338	12	0
Ward & Tetley, Bradford	6,195	0	0
G. W. Meanley, Highgate	6,138	0	0
W. Brigg, Bradford	6,100	0	0
Bower Bros., Halifax	6,065	0	0
A. Braithwaite, Leeds	6,045	6	4
Lock, Andrews & Price, Nottingham	5,987	15	6
E. Rothera, Featherstone	5,943	17	4
G. Clements, Featherstone	5,900	0	0
W. Waring & Sons, Huddersfield	5,857	8	10
W. Craig, Manchester	5,831	0	0
R. Holmes & Sons, Chesterfield	5,800	0	0
T. Morrison, Bawtry	5,780	0	0
Beighton & Berry, Chesterfield	5,709	10	8
W. Morley & Sons, Keighley	5,631	12	10
H. H. Barry, Radcliffe-on-Trent	5,600	0	0
G. Mackay & Son, Edinburgh	5,577	17	0
J. W. Dean, London, W.C.	£5,474	14	8
H. E. Buckley,* Bradford	5,464	5	9
J. W. Broadhead, Purston, Pontefract	5,100	0	0

*Accepted.

Catford.—For the erection of dairy, office and can-washing shed, for Messrs. Panter & Sons. Mr. John Rowland, architect, Old Charlton, Kent:—

May Bros.	£305
S. T. Stevens	275
Sanford & Co.	243
Thomas & Edge	213
Loasby & Salmon	181

Gerrard's Cross (Bucks).—For the erection of a house and stables for W. G. Blakemore, Esq. Mr. Hugo R. Bird, architect and surveyor, Brentwood, Essex:—

G. Darlington, Amersham	£1,730
F. W. Burtwell, Brentwood	1,663
Watkins, Watford	1,640
Lovell & Sons, Gerrard's Cross	1,468
Henry Brown, Stoke Newington, N.	1,423
Ernest Dix, Brentwood	1,392
F. Jarvis,* Brentwood	1,365

* Recommended for acceptance.

London.—For the work of completing the carriageways and footways on sections A and B of the Totterdown Fields Estate, for the London County Council:—

S. Kavanagh & Co., Surbiton	£6,926	0	9
C. W. Killingback & Co., London	6,643	6	7

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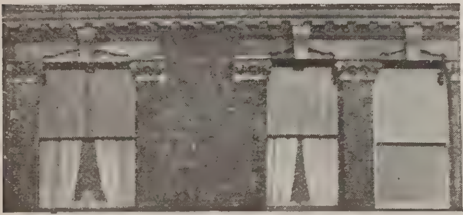
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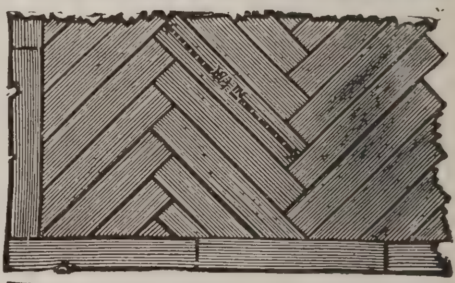
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J. Mowlem & Co., Ltd., London	6,290	0	0
W. Griffiths & Co., Ltd., London	6,120	11	7
E. & E. Iles, Wimbledon	5,910	7	0
G. Wimpey & Co., Hammersmith	5,841	11	2
O. T. Gibbons, Leytonstone ...	5,474	19	1
W. Manders, Leyton	5,401	4	4
F. J. Coxhead,* Leytonstcne ...	5,391	0	0
Grounds & Newton, Tottenham	5,084	7	4

Architect's estimate, £5,990.
* Recommended for acceptance.

London, E.—For improvements at British Street school, Poplar, for the London County Council:—

J. Appleby & Sons, Lambeth ...	£12,660	0	0
W. Lawrence & Son, Waltham Cross	12,387	0	0
W. Gregar & Son, Stratford ...	11,997	0	0
J. & M. Patrick, Wandsworth	11,735	0	0
E. Lawrance & Sons, City Road	11,697	0	0
Kirk & Randall, Woolwich ...	11,690	0	0
W. H. Lascelles & Co., Ltd., 121, Bunhill Row	11,597	0	0
J. Parsons, 190-192, Waterloo Road	11,442	9	5
T. D. Leng, Deptford	11,419	0	0
G. E. Wallis & Sons, Ltd., Maidstone	11,203	0	0
Treasure & Son,* Cottenham Road, Upper Holloway... ...	10,559	0	0

Architect's estimate, £10,620.
* Recommended for acceptance.

Long Ditton.—For the construction of proposed filter-beds, &c., at Long Ditton, for the Metropolitan Water Board:—

J. Mowlem & Co., London ...	£101,625	0	0
W. Manders, Leyton	97,182	7	5
Perry & Co., London	92,232	0	0
H. Lovatt, Ltd., Wolverhampton	89,345	18	8
S. Pearson & Son, London ...	83,618	1	2
W. Kennedy, Ltd., Lanark ...	83,531	10	7
A. E. Nunn, London	72,627	1	10
F. Osman, Southampton ...	71,856	0	0
T. Docwra & Son, London ...	69,998	14	6
Kirk & Randall, Woolwich ...	67,824	0	0
Pedrette & Co., London	61,893	19	3
J. Aird & Sons, London	61,876	15	10
G. Hay & Co., London	61,696	4	8
C. Wall, Ltd., London	61,309	0	0
R. H. B. Neal, Ltd., Plymouth	57,443	14	5
J. Moran & Son, London ...	56,996	0	0
W. Muirhead & Co., London	55,604	13	0
Pethick Bros.,* London	54,783	0	0

*Recommended for acceptance.

Newcastle-under-Lyme.—For the rearrangement and extension of the Orme Girls' School, Newcastle-under-Lyme, Staffs, for the Governors. Messrs. A. R. Wood & Son, architects, Tunstall and Burslem. Quantities supplied by architects:—

W. Cooke, Burslem	£4,609
W. Grant & Sons, Burslem	4,550
S. Heath, Basford	4,549
J. Bagnall, Fenton	4,500
T. Godwin, Hanley	4,478
Tompkinson & Bettely, Longton ...	4,247
S. Wilton, Newcastle-under-Lyme ...	4,140
H. Emery,* Newcastle-under-Lyme ...	3,980
C. Smith, Tunstall	3,956

*Accepted.

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—adjudication.]

B. Napier, builder, Brighton. R.O., Dec. 4.

W. Lovatt, builder, Biddulph. R.O., Dec. 5.

C. E. Strange, builder, Oadby. R.O., Dec. 7.

J. P. Farrar, builder, Manchester. R.O., Dec. 7.

J. Lowe, builder and contractor, Sheffield. R.O., Dec. 7.

G. W. Disney, builder, Beeston and Draycott. R.O., Dec. 4.

W. H. Thorpe, builder, Hastings. Liabilities, £247; assets, £325.

W. Aitchison, painter and decorator, Waterloo and Blyth. Adj., Dec. 5.

S. Hallam, joiner, Shirland. P.E., Derby C.C., Jan. 15, at 11. R.O., Dec. 3.

William Wade, builder, Crewe. Gross liabilities, £18,210; assets, £935; deficiency, £2,169.

F. C. Ironmonger, timber merchant, Birmingham. Liabilities, £880; deficiency, £740.

A. Kew, builder, Charter Alley, near Basingstoke. P.E., Castle of Winchester, Jan. 7, at 11.

J. Bromley, builder and contractor, Balsall Heath and Kenilworth. P.E., Birmingham C.C., Jan. 21, at 2.30.

T. Jones, builder, New Brighton. First meeting, O.R.'s, Liverpool, Dec. 19, at 12. P.E., Birkenhead C.C., Jan. 22, at 10.30.

W. Coates, plumber and painter, Longridge. First meeting, O.R.'s, Preston, Dec. 19, at 11. P.E., Sessions Hall, Preston, Jan. 11, at 11.

H. Williams, builder and contractor, Tranmere. First meeting, O.R.'s, Liverpool, Dec. 19, at 2.30. P.E., Birkenhead C.C., Jan. 22, at 10.30.

H. J. Williams, painter, Great Yarmouth. First meeting O.R.'s, Norwich, Dec. 19, at 3.30. P.E., Town Hall, Great Yarmouth, Jan. 8, at 11.

J. W. Falkner & Sons, builders and contractors, Camberwell. First meeting, London Bankruptcy Court, Dec. 20, at 2.30. P.E., same, Jan. 31, at 11. R.O., Dec. 6.

C. G. Hill, builder and contractor, London and Coventry. First meeting, London Bankruptcy Court, Dec. 19, at 2.30. P.E., same, Jan. 24, at 11.30. R.O., Dec. 8.

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182 feet to Jubilee Street,
123 feet to Lindley Street, and
307 feet to Adelina Grove,

the whole embracing a total superficial area of 57,000 square feet.

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MESSRS. DANIEL WATNEY & SONS are instructed by the Mercers' Company, with the approval of the Board of Education, to LET the above by AUCTION at the Mart, E.C., on Thursday, January 10 next, at Two o'clock.

Particulars, with plan and conditions of letting, may be obtained of Sir John Watney, Mercers' Hall, Cheapside, E.C.; at the Mart; and of the Auctioneer, 33, Poultry, E.C.

FOR SALE.—FREEHOLD BUILDING LAND, about 3¾ acres with large frontage to mainroad; room for 90 houses Also remainder of brickfield with three-quarter millions of bricks to make up. Sheds, offices, and complete plant, cart and horse. Price, £3,000.—Address, Mecklenburg, Hounslow.

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"White Webbs," Hadley Wood. J. L. Williams, Architect. "Little Court," Farthingstone, Northants. Walter Cave, Architect. With 12 Illustrations.

A Sketch of Irish Ecclesiastical Architecture. VI.
Irish Romanesque. Part III. A. C. Champneys. With 20 Illustrations.

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Canopy over the Tomb of Bishop Gavin Dunbar, St. Machar's Cathedral, Aberdeen. Measured and drawn by R. J. Johnston.
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W. Niven.

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"Kindly remove my name from your Employment Register. I am glad to say I have obtained a berth through its agency, for which I am obliged to you."

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Writes a *Prominent Architect.*

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From a *Somersetshire Builder & Contractor.*

The above letters speak for themselves, and it only remains for you to give the Employment Register a trial, and below we give full particulars of the cost of making your requirements known.

For 3s. we give three insertions (in a four-line advertisement) in our "Appointments Wanted" Columns, and also 6 insertions in the "EMPLOYMENT REGISTER" (see page xxviii).

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The Title Pages and Index to any volume of "THE BUILDERS' JOURNAL" may be had free, upon application being made to the Office, Great New Street, enclosing 1d. stamp to cover postage of same.

SPECIAL NOTICE.

Owing to the Christmas Holidays "The Builders' Journal" for next week will close for press on Friday, December 21st, at 12 o'clock noon, and copy for all Advertisements should reach this office not later than first post on Friday morning. Advertisements for the Miscellaneous, Appointments Wanted and Vacant Columns for that issue will be accepted up to 5 o'clock on Friday evening.

Appointments Wanted.

The charge for Advertisements under this heading is 1s. 6d. per insertion not exceeding four lines, and 6d. per line afterward, prepaid. Three insertions may be had for the price of two. Advertisements must reach the Office not later than 5 o'clock on Monday.

ARCHITECT'S JUNIOR or IMPROVER (23), 5½ years' experience; plans; working drawings; details, colouring, &c.—William Buchanan, Clifton, Motherwell, N.B. 2241

ARCHITECT'S ASSISTANT (25) desires ENGAGEMENT. Working drawings, details, perspectives, quantities, &c. Good designer and colourist.—Aubrey Pritchard, The Grove, Rhyl, North Wales. 2232

ARCHITECT'S JUNIOR ASSISTANT desires RE-ENGAGEMENT in a good London office: 6 years' experience; good references; salary moderate.—B. E. Atkinson, Junr., 14, Rosslyn Hill, Hampstead, N.W. 2245

ARCHITECT'S JUNIOR ASSISTANT requires ENGAGEMENT. Neat draughtsman, tracer, colourist, &c. Specimens submitted. When writing state salary offered.—Apply J.E.T., 24, Ashbourne Road, Mitcham, Surrey. 2227

ARCHITECT'S ASSISTANT; 12 yrs.' experience, 3 in building; general drawings, perspectives, surveys, levelling, quantities, accounts, supervision; ex. refs.; mod. salary; temporary or permanent.—Box 2261, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT'S ASSISTANT (21), served 5 yrs. in country, wants SITUATION in London office; salary optional.—C. G. Cowlishaw, Friars Wood House, Newcastle, Staffs. 2256

ARCHITECTURAL ASSISTANT; age 25; details: working drawings, drainage, specifications, perspective, etc.; salary, £2 10s.—F. W. L., 22, St. James' Square, Notting Hill, W. 2258

ARCHITECT and SURVEYOR'S ASSISTANT, with 11 years' provincial and London experience, shortly disengaged, DESIRES BERTH; salary moderate.—Surveyor, 6, Walcot Parade, Bath. 2267

ARCHITECT'S and SURVEYOR'S ASSISTANT (20); working drawings from rough sketches, details, land surveying, quantities, typewriting; 3 building construction certificates; salary, 22s.—H.L.M., 5, Winton Street, Ryde, I. of W. 2266

ASSISTANT (27), 12 years' first-class experience; passed final R.I.B.A.; design working, drawings, details, perspectives, specifications, supervision, quantities and general office work; salary very mod.—B., 85, Durham Road, East Finchley. 2223

ARCHITECT'S AND SURVEYOR'S ASSISTANT (22) DISENGAGED. Student R.I.B.A.; 6 yrs.' experience; working drawings, details, perspectives, specifications, surveys, quantities,; first. class testimonials; moderate salary.—Helm, Victoria Road, Woolston, Hants. 2283

ARCHITECT'S ASSISTANT desires RE-ENGAGEMENT, 6½ years' varied experience; construction certificates; design, details, specifications, surveys, &c.; good references.—W.C.S., 90, Antill Road, South Tottenham, N. 2279

ARCHITECT'S JUNIOR ASSISTANT desires ENGAGEMENT, Edinburgh or Glasgow perferred; five years' experience; good draughtsman; designs, working drawings, perspectives, surveying and levelling, &c.; moderate salary.—Andrew H. Balfour, 23, Abercorn Terrace, Portobello, N.B. 2281

A.R.I.B.A. desires CHANGE OF SITUATION, either temporary or permanent; eight years' experience: designs, working drawings, details, perspectives, quantities, specifications, surveys, levels, &c.; 24 years of age.—Box 2280, Builders' Journal Office, 6, Great New Street, Fetter Lane, E.C. 2280

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BUILDER'S SON (22) desires ENGAGEMENT in Liverpool or district; 8 years' experience; good draughtsman; also certified in building construction.—Apply Box 2282, Builders' Journal Office, 6, Great New Street, Fetter Lade, E.C.

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CLERK of WORKS wants RE-ENGAGEMENT. Town or Country. Experienced and practical. First-class references from London and country architects.—F. B. S., 17, Southborough Road, South Hackney, London, N.E. 2242

CARPENTER, JOINER wants JOB. Bench, fixing or jobbing, or will take piecework any quantity; labour only; good testimonials.—H., 86, Alderney Street, Pimlico, S.W. 2225

CLERK OF WORKS or GENERAL FOREMAN seeks RE-ENGAGEMENT, town, country or abroad; thoroughly experienced home and abroad; good testimonials; age 35.—P. G., 428, Uxbridge Road, W. 2224

ESTIMATOR'S ASSISTANT (22), DISENGAGED; quick and reliable at figures; abstracting and accounts; used to large works, also time, wages, and general routine; good references.—A., 100, Hamilton Road, Wimbledon. 2230

GENERAL WORKING FOREMAN seeks RE-ENGAGEMENT. Trade Carpenter and Joiner; age 33; abstainer; reliable; 6 years' good references.—A C. Smith, 86, Brunswick Road, Leyton. 2244

GENERAL or WORKING FOREMAN DISENGAGED. In London or country. Twenty years' practical experience in new building and alterations. Trade, bricklayer. Age 43. Good references from last employers.—H.C., 5, Westbury Road, Paddington. 2226

GENERAL FOREMAN DISENGAGED; trade, bricklayer; age 30, and life abstainer; 5 years with present firm; large experience in Church work; a good detail draughtsman and manager of men; excellent references.—Address B. T. A., care of Byhurst, 2, The Parade, Chiswick Lane, London, W. 2253

GENERAL or WORKING FOREMAN (carpenter); new or alterations, town or country; practical experience all branches; good manager and timekeeper; moderate wage.—W., 29, Pollock Road, Walworth, S E. 2263

MANAGER or GENERAL FOREMAN seeks ENGAGEMENT; thoroughly practical; drawings, quantities, estimates and supervision; excellent references; terms moderate.—J. F. S., 67, Leyton Park Road, Leyton. 2255

MACHINIST (22) requires SITUATION. Over and under, circular saw, band saw, thicknessing and morticing machines.—A. H. Thresher, 9, Leith Terrace, Burntwood Lane, Tooting, S.W. 2284

PAINTER (good) requires WORK; young man, age 27; town or country; used to all classes of work; abstainer; state wages.—A.W.P., 19, Chesterfield Gardens, Harringay, Middlesex. 2175

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QUANTITY SURVEYOR'S ASSISTANT (22) desires ENGAGEMENT; 6 years' London experience working up and taking off; temporary or otherwise; London or Provinces; salary moderate.—Box 2165, Builders' Journal.

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December 10th, 1906.

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EMPLOYMENT REGISTER.

Too late for Classification.

See p. xxviii *for the Employment Register.*

2279—Architect's Assistant, 6½ yrs.' experience; construction certificates; design, details, specifications, surveyors, etc.; good refs.

2280—A.R.I.B.A. (24) desires change, temporary or permanent; 8 yrs.' exp.; designs, details, working drawings, perspectives. quantities, specifications, surveys, levels, &c.

2281—Architect's Junior Assistant, Edinburgh or Glasgow preferred; 5 yrs.' exp.; good draughtsman, designs, wkg. drawings, perspectives, surveying and levelling; mod, salary.

2282—Builder's Son (22), Liverpool or district; 8 yrs.' exp.; good draughtsman; certified in building construction.

2283—Architect's and Surveyor's Assistant (22); student A.R.I.B.A.; 6 yrs.' exp.; wkg. drawings, details, perspectives, specifications, surveys, quantities; good testimonials; mod. salary.

2284—Machinist (22); over and under, circular saw, band saw, thicknessing and morticing machines.

SEE PAGES XXVI AND XXVIII FOR EMPLOYMENT REGISTER.

THE BUILDERS' JOURNAL
AND ARCHITECTURAL ENGINEER.
December 19, 1906.
FIRE SUPPLEMENT (MONTHLY).
Vol. XXIV, No. 619.
6, Great New Street, London, E.C.

NOTABLE FIRES ON THE CONTINENT.

Perhaps the two most interesting fires during the past twelve months have been those known as the Tanners' Hall fire at Paris, and the oil warehouse fire at Bremen. Both are characteristic of the hazards to be met with in large cities owing to inefficient building construction.

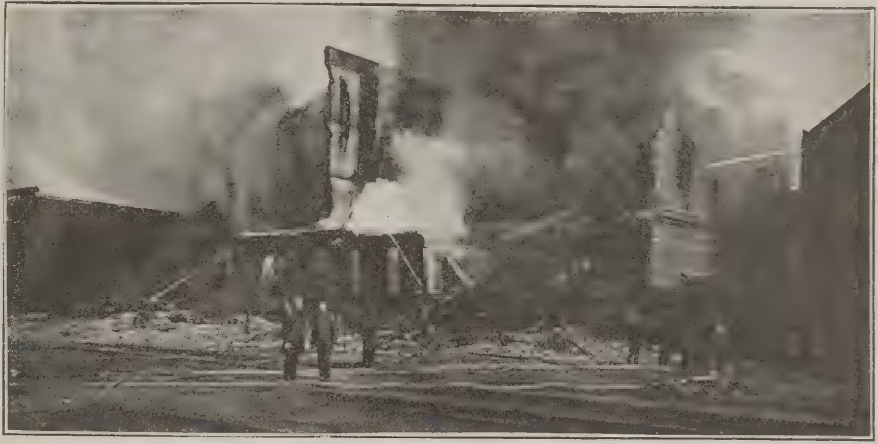
We reproduce a plan and two photographs of the fire at the Bremen oil warehouse with the view of indicating the destruction wrought in buildings of this kind, and one of the views is of particular interest, having been taken actually during the fire. Of the Paris fire we also give a small plan and reproduce two photographs, one of which is a bird's-eye view.

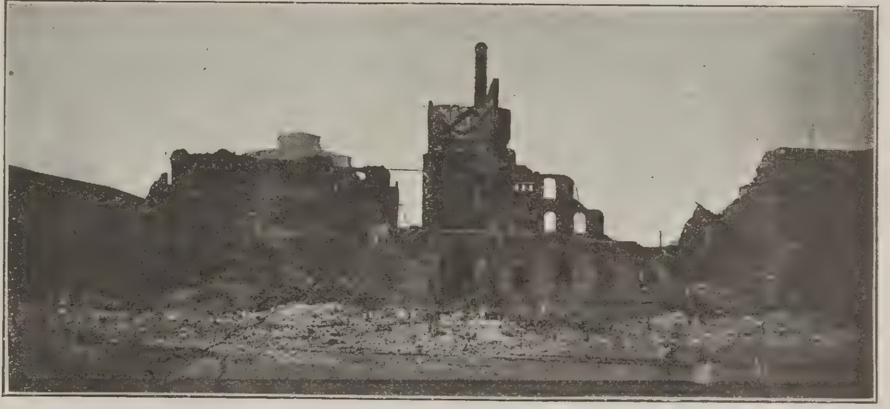
Regarding the Bremen fire, this broke out at half-past four in the morning, and our first photograph showing the destruction of the building was taken at 9.30 a.m., after five hours, the nature of the premises being that of an oil refinery combined with an oil warehouse.

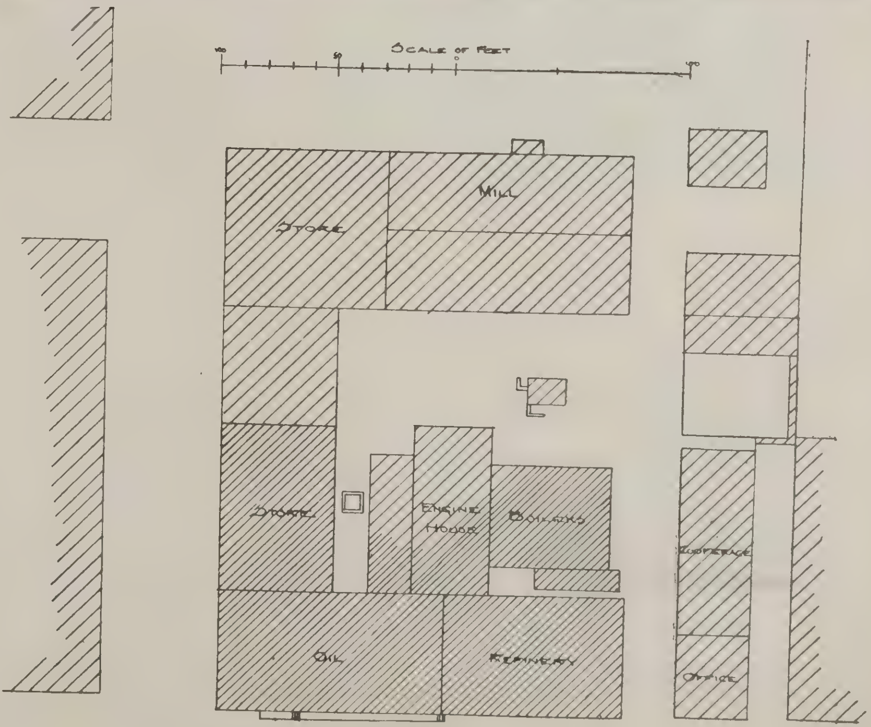
The fire was a peculiar instance of the rapidity with which such a fire spreads, it having been shown that within one and a half minutes of the fire having been noticed quite in a small way, the oil vapour had carried flame to all imaginable ducts and shapes in every part of the building, so that practically the whole place was alight from top to bottom within five minutes of the outbreak, the rapidity of the fire being such that it was with the greatest possible difficulty that the men working in the refinery at the time were even able to make an effort to escape, and, as a matter of fact, two lost their lives.

The nearest fire station was within five hundred yards from the scene of the fire, but owing to the extraordinarily rapid spread and the high temperature reached, the work of the brigade had to be limited entirely to protection of neighbouring property. This policy in itself was of considerable importance, as there were warehouses close by with large and valuable stores, and some eight hundred bales of cotton close at hand on an adjoining wharf actually caught alight. The loss may be taken at £100,000.

Regarding the Paris fire, this took place in a block of buildings which might almost be described as of historical interest so far as construction was concerned, and again owing to the big stores of an oily description there was a most rapid spread of flame, practically the whole of the main building being alight within ten minutes of the fire being noticed. Here the whole effort of the brigade had to be applied to coping with the fire halfway down the block, and in these efforts they were eminently successful.



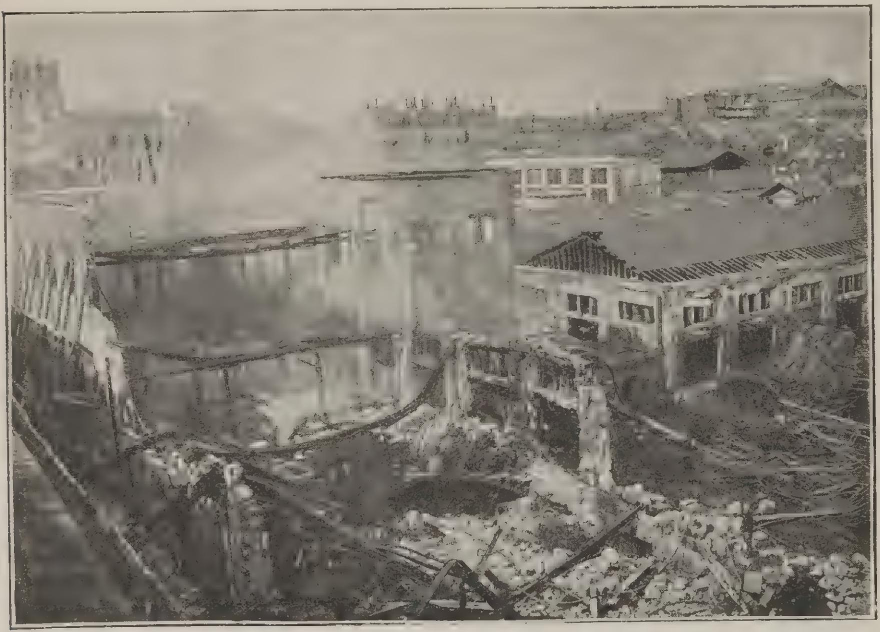


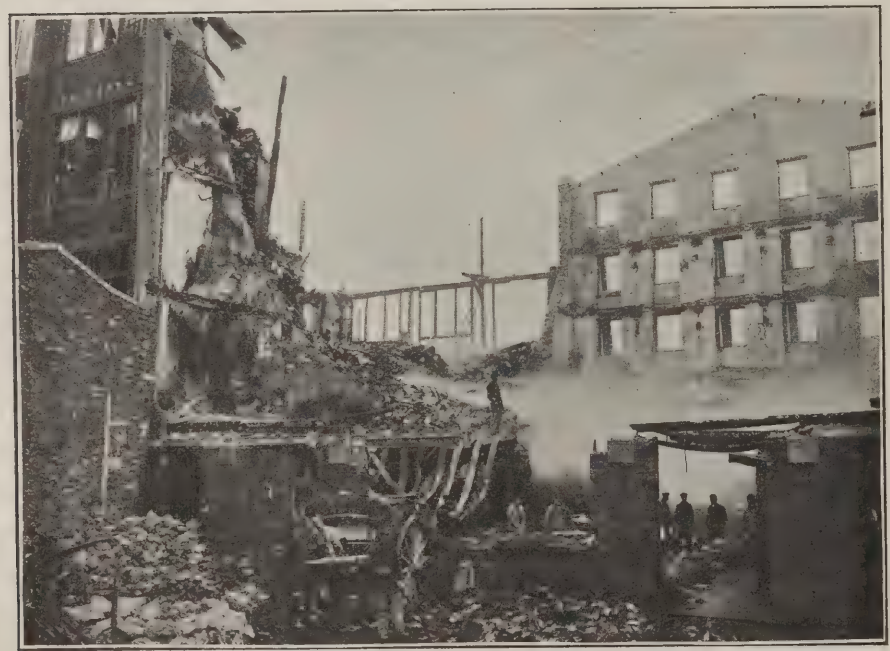


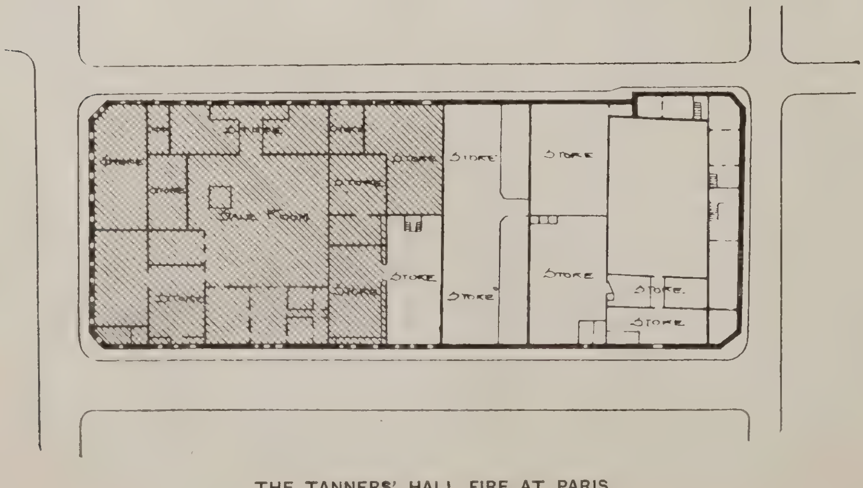
THE OIL WAREHOUSE FIRE AT BREMEN.

Whilst the Bremen fire required thirty-two branches, the Paris fire required thirty-one.

Both fires are object lessons as to the necessity of better sub-division and better construction.







THE TANNERS' HALL FIRE AT PARIS.

THE BOLTON TIMBER YARD FIRE.

The fire which recently occurred at Messrs. J. Cooper & Sons' timber yard and saw mills, Shiffnall Street, Bolton, should serve to draw attention to the need of special precautions that should be observed in the selection of a suitable site for works of this description, where a large amount of dry timber is being stored, and in the employment of some system of fire-resisting construction whereby the danger of the rapid spread of fire is greatly obviated.

It will be seen from the plan given herewith, that these works were surrounded by buildings chiefly of the warehouse class in which are stored cotton waste and other goods of a highly inflammable nature; in addition, another timber yard belonging to Messrs. Cooper is immediately behind, and timber in large quantities is also stacked in the yard of Messrs. Threlfall's works in Shiffnall Street. These surrounding premises were in great danger owing to the strong wind prevailing at the time of the disaster, which caused the fire to spread with such rapidity that in an hour and a half from the commencement the major portion of the works was completely gutted. The direction of the wind is shown by the arrow on the plan.

The fire commenced shortly before midnight on Monday, November 27th, and the alarm was given from the Bolton Corporation tramway sheds, where a number of cleaners were at work; in about a quarter of an hour the brigade was on the spot and quickly got several hoses into play.

The Cause of the Fire.

The exact cause of the fire has not been ascertained, but it is clear that it began close to the spot marked "A" on plan, and probably in the basement. The premises were lit by electricity, the wires being run in wood casings, and possibly short circuiting is to blame; on the other hand, the shavings and dust waste from the saws were kept in the basement at this point, in close proximity to the oil store, and spontaneous combustion may thereby have been generated.

The Damage.

The damage (estimated at £20,000, and covered by insurance) will be seen on reference to the plan. The works consisted of timber yard, saw mills, &c., stores, engine and boiler houses with tall stack, and offices. The latter, together with boiler house, engine house and chimney stack have been saved, the rest of the buildings being completely gutted. The saw mills and workshops consisted of basement, ground and first floors, the remainder of the premises ground and first floors only.

Construction of the Buildings.

The external walls were 18ins. thick at the ground floor piers, with a 4½-in. set-back at window openings, which had brick arches and wood lintels over, and stone sills.

The wooden floorings were carried by strong cast-iron columns, which at intermediate points also carried roof principals; several of the latter remain in position on the Shiffnal Street side, but scarcely any of the general roofing of spars and slates remains.

These premises were built in 1887, a similarly disastrous fire having destroyed the previous premises of the firm.

Lessons of the Fire.

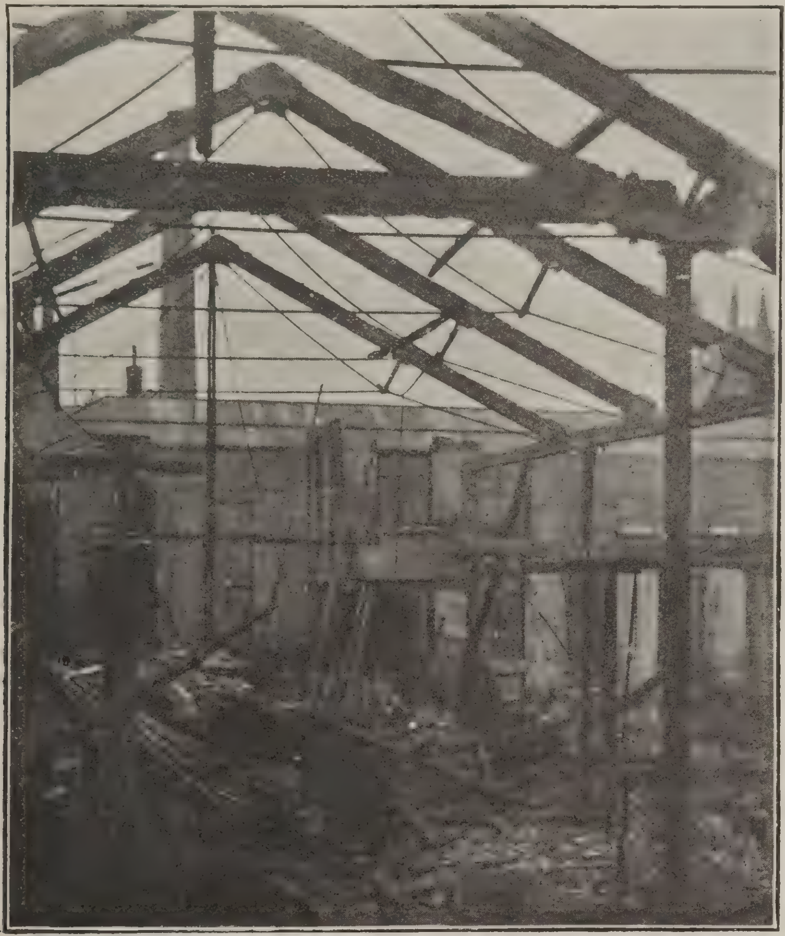
In connection with this fire one point is worthy of special emphasis. In buildings and works such as these, where large open spaces are uninterrupted by cross walls, there is special need of a fire-resisting *roof* for two reasons: firstly, the protection of the structure in case of a fire close at hand; and secondly, the prevention of damage to neighbouring buildings by confining the fire within the premises for a sufficient time. In the present instance large burning pieces of roofing and sparks were blown to a considerable distance, and only the utmost efforts of the firemen and drenching rain prevented a dangerous outbreak.

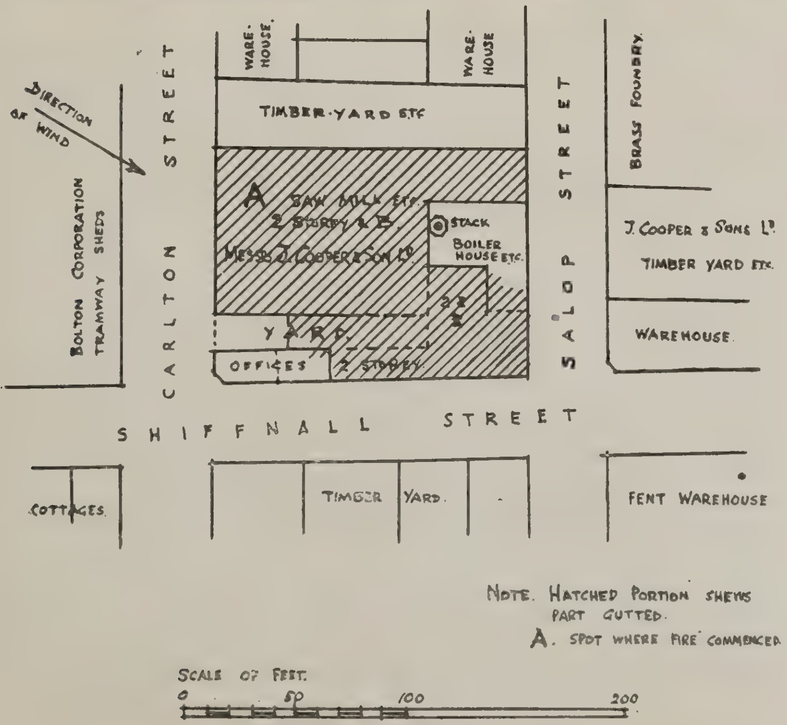
The roof principals used here consisted of wood rafters with cast-iron struts, head and foot boxes, and wrought-iron tie-rods. The latter have been twisted round, and in some cases have pulled the struts and foot boxes from off the rafters by the action of the fire. Where this has been the case the principals have all come down, in several instances bringing the cast iron columns with them. One infers from this that if wooden roofs are bound to be used in cases, let them be wholly of wood and not a combination with iron.

The columns have stood the test fairly well generally, being 11ins. in diameter at the ground floor and having a good thickness of metal, and the temperature not being as high as one would anticipate, yet notwithstanding this, one of the broken ones presents a striking instance of the unreliability of cast-iron columns, and shows how important it is to have them tested before erection. The thickness of metal was found on measurement to vary from 2½ins. to ⅛in. for a considerable distance from the fracture. The core of this column had evidently "floated" in casting.

The principal rafters and many of the larger floor beams and joists have stood remarkably well, as have also the wood lintels over window openings.

Timber merchants, joiners, and others habitually use a great deal of the material with which they are best acquainted in the erection of their workshops, and one is thereby led to hope that some form of wooden fire-resisting or "slow combustion" type of construction, as used abroad and lately illustrated in this journal, will in the future become more general for buildings of this class.





THE BOLTON TIMBER YARD FIRE.

INQUESTS ON FIRES.

Dr. F. J. Waldo, the coroner of the City of London, gave an address on November 21st to the City United Wards Club upon fires and fire inquiries. In Scotland inquiry is made into all fires by the Procurator Fiscal, who conducts a secret inquiry, and has the power to swear witnesses. In England, Ireland and Wales there is no general judicial inquiry into non-fatal fires, except in the City of London, where the coroner, by a local Act, has power of inquiry at his discretion into all fires in the City, whether fatal or otherwise. In ancient times all coroners had this right, which, however, fell into disuse after the reign of Edward I. It remained unquestioned until the year 1860, when in the ruling case of *Queen v. Herford* it was decided that non-fatal fires were outside the coroner's jurisdiction. The power was formally restored to the City of London by Parliament in 1888. There are obvious advantages in the routine inquiry into the cause and origin of fires, such as the detection of crime and prevention of fires. There is some difference of opinion as to the best form of administration. In restoring the procedure to the coroner's court, however, a simple machinery would be ready at hand. The whole question is now under the consideration of the Home Office. One interesting point was that the coroners possessed the function of fire inquiry for upwards of 800 years. Dr. Waldo went fully into the electrical fires that occurred at the Bank Exchange and Oxford Court in 1905, as also into those that took place in the test-rooms at Nos. 57 and 59, London Wall, in 1902 and 1905, and gave his experiences as regards other short-circuit fires examined by him and the City Electrical Engineer. He explained how many practical improvements in exchanges, including the reconstruction of the P.O. Exchange in Carter Lane, had followed on these inquiries.

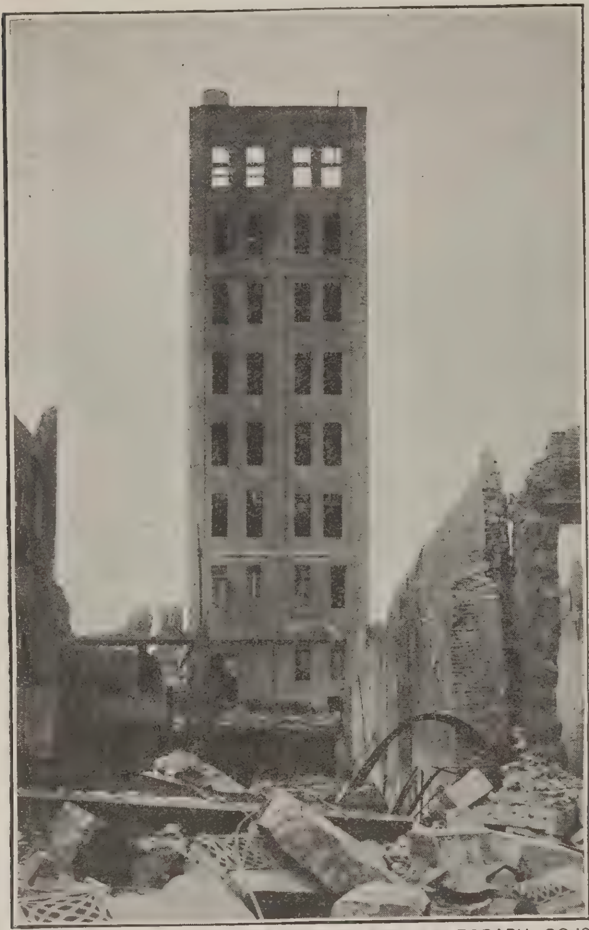


FIG. 1.—PACIFIC STATES TELEPHONE AND TELEGRAPH CO.'S MAIN OFFICE, SAN FRANCISCO: REAR VIEW.

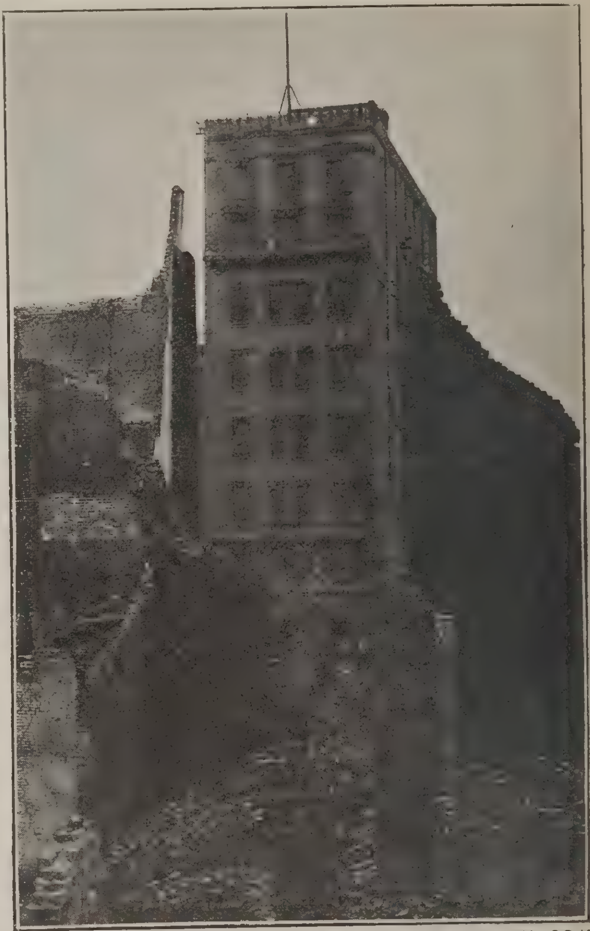


FIG. 3.—PACIFIC STATES TELEPHONE AND TELEGRAPH CO.'S MAIN OFFICE: FRONT VIEW.

PROTECTION OF WALL OPENINGS.

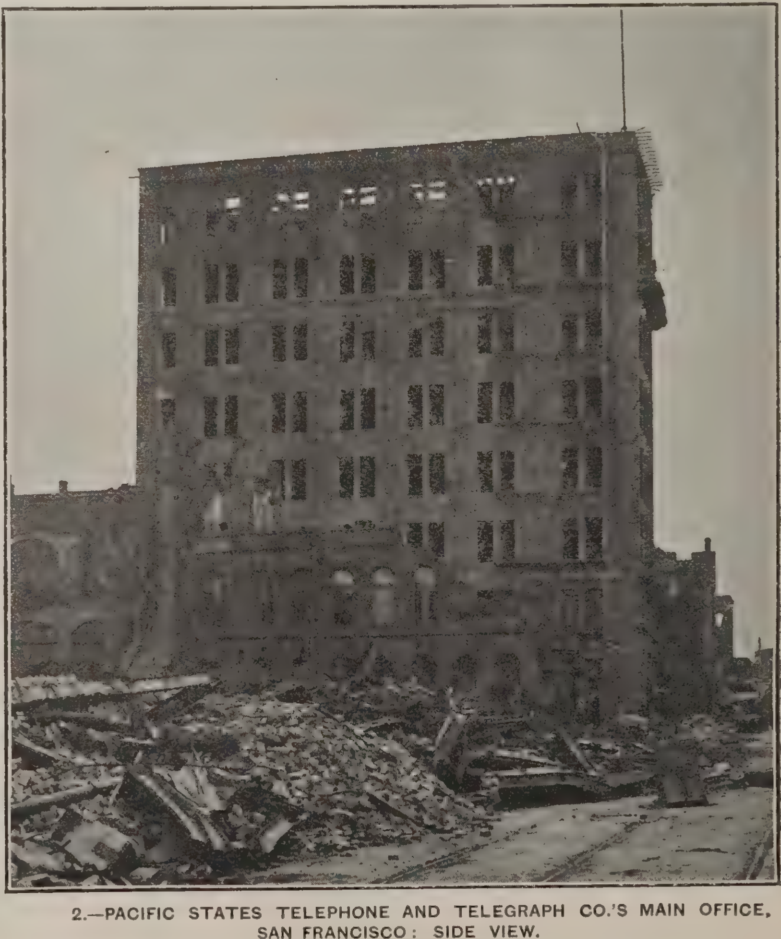
We have had frequent occasion to refer to the efficiency of the Kinnear roller shutters when under test before the British Fire Prevention Committee and also in actual fires. We have now pleasure in adding some additional particulars by way of illustration, thanks to the courtesy of Messrs. Arthur Gibson & Co., who have put some photographs at our disposal taken at the San Francisco fire.

These photographs not only illustrate the efficient service rendered by the roller shutters, but give some interesting general views of certain aspects of the fire.

As we have indicated before, the Kinnear shutters always appear to afford an excellent fire stop, and the only thing which could be improved upon is the question of radiation, which, where single shutters are used, might sometimes result in highly flammable materials on the further side of the shutters catching alight.

In our Fire Supplement for November 21st we published an article on the protection of wall openings by Captain John Stephen Sewell, which deals more particularly with the results of the fire at San Francisco.

In the first column on page 48 Captain Sewell says in his article that in the Bush Street Exchange some of the openings were closed on the outside with rolling shutters made of interlocking corrugated slats, and adds that such a shutter will stop radiant heat for a time, but if it becomes too severe there is danger of the slats warping away from each other, and that the actual impact of flame would almost certainly produce that result. In this he is in error, as is demonstrated by the British Fire Test



2.—PACIFIC STATES TELEPHONE AND TELEGRAPH CO.'S MAIN OFFICE, SAN FRANCISCO: SIDE VIEW.

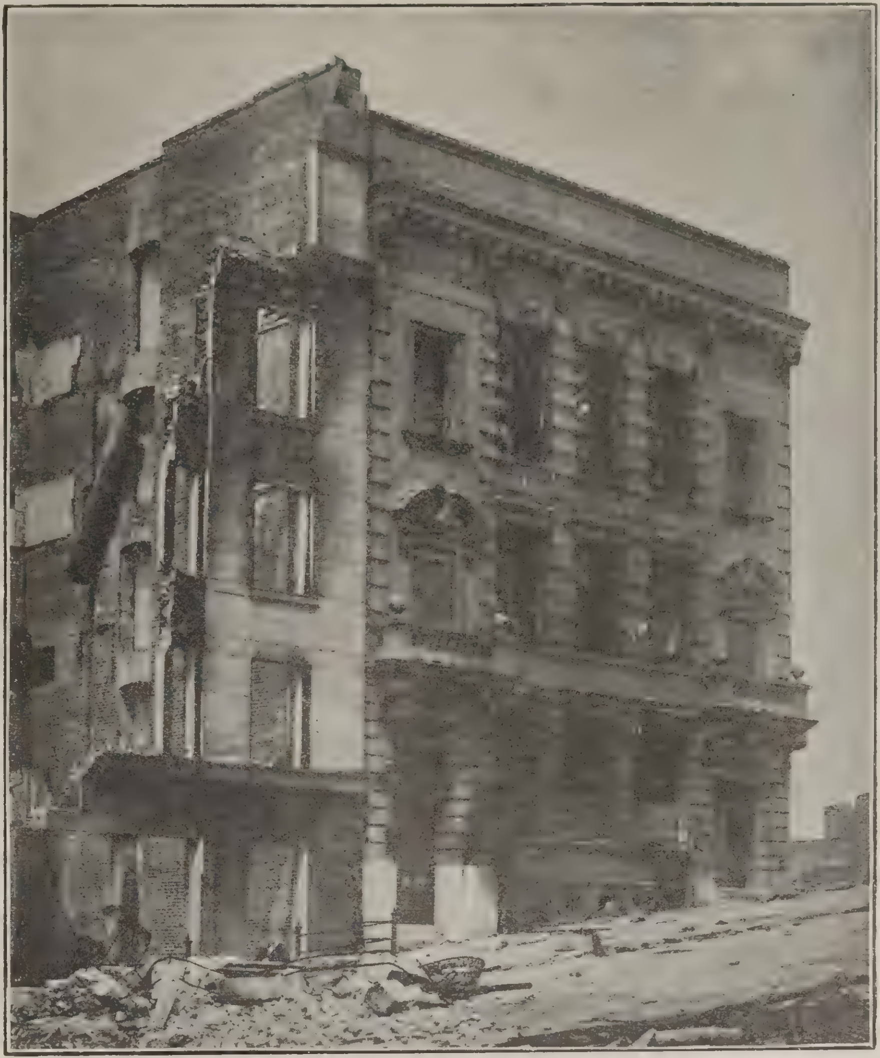


FIG. 5.—AN EXCHANGE OF THE PACIFIC STATES TELEPHONE AND TELEGRAPH CO., SAN FRANCISCO.

No. 113, and previous tests by the British Fire Prevention Committee, of the Kinnear shutters. It is also proved by the actual results in the fire at San Francisco. Captain Sewell is also in error in stating that the best solution may prove to be a continuous flat sheet of steel, or a shutter composed of several such sheets. The continuous sheet would certainly warp out of the grooves, and if the shutter were made up of several telescopic sheets, the sheets would certainly warp apart.

We now draw attention to the accompanying photographs.

Figs. 1, 2, 3 and 4 are views of the main office of the Pacific States Telephone and Telegraph Co. This building was fitted on the rear (Fig. 1) and on the side (Fig. 2) with wired-glass windows in metal frames, and the openings on the side of the building (Fig. 2) were further protected by wood shutters covered with tin, which were concealed in boxes between the brick walls and the wire mesh and plaster coverings.

The openings on the front (Fig. 3) were fitted with Kinnear shutters and ordinary glazed windows with wood frames. The shutters were placed on the inside of the windows. The fire in this building came through the single opening on the ground floor at the rear of the building. This is the opening shown on the left in Fig. 1, and it was the only opening in the building unprotected. The fire having gained an entrance here, was communicated to the various floors by means of the cable well and an opening to the stairway. The building was also exposed to fire on all sides. The wired-glass and metal frames in a great many cases were entirely destroyed, and in the remaining cases were so badly damaged that it was necessary to refit every opening. The same remarks apply to the tin-covered wood shutters.

Figs. 1 and 2 show what a clean sweep was made of all the openings on the side and rear.

The Kinnear shutters on the front were exposed to a high degree of heat, but were not damaged except in one or two cases, where new slats will have to be supplied. In all other cases the only new material required will be the springs inside the rollers.

Fig. 3 shows clearly that all the openings on the front of the building fitted with Kinnear shutters are still closed, and that the front of the building itself received very little damage. All buildings having terra-cotta or stone framing suffered a great deal where the heat and flame had come through the window openings like a blast. The insurance companies stated that about 75 per cent. of the damage to fronts of buildings was due to this cause alone.

Fig. 4 is an interior view of the same building looking towards the front, and shows the Kinnear shutters in position. The walls in this building were covered with angle-iron studding running vertically, on which was stretched wire mesh, and this was finished in plaster. This acted as a protection to the structural frame of the building. The ceilings were made in the same manner. In Fig. 4 it will be noted that light shows through underneath the shutters. This is due to the stone sills having been torn away. On the right-hand shutter it will be noted that light shows through between the grooves or guides and the jamb. This condition existed on several openings, and was due to the fact that the shutters were made from plans, and not from actual measurements. The openings were made somewhat larger than shown on the plans, and as a consequence, it was necessary to fill in between the grooves and jambs with cement, and this cement fell away.

Fig. 5 is a view of an exchange of the same company. This shows the front with three Kinnear shutters at each side.

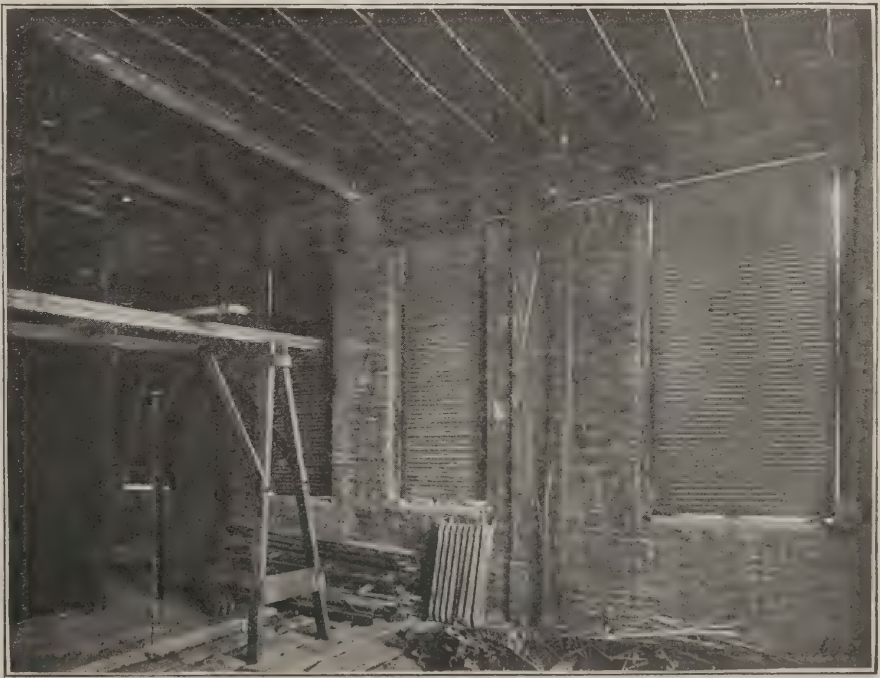


FIG. 4.—PACIFIC STATES TELEPHONE AND TELEGRAPH CO.'S MAIN OFFICE: SHUTTERS ON FRONT FROM INSIDE.

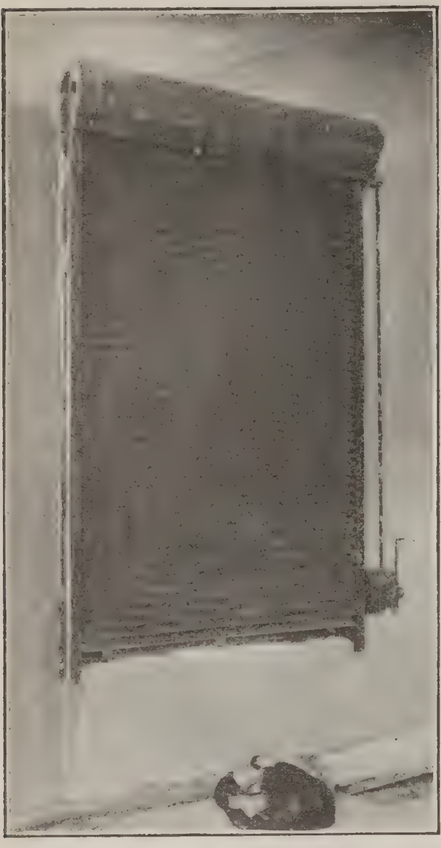


FIG 6.—A SHUTTER ON THE THIRD FLOOR OF THE PACIFIC STATES TELEPHONE AND TELEGRAPH CO.'S EXCHANGE.

The idea in this arrangement, with shutters only at the openings in the extreme sides of the front, was to guard against a lap fire from the adjoining buildings; exposure from across the street was not considered serious, and therefore the three centre openings on each floor were not protected, and the fire entered the building through these large central openings. The rear of this building was fitted with some Kinnear shutters, and some standard shutters—*i.e.*, wood doors covered with tin. The shutters shown on the front of the building (Fig. 5) are all operative and in good condition, except that they require new counterbalance springs. The opening at the right-hand side of the building on the first floor, is in front of the toilet room, the partition wall of which can be seen through the central windows. This room is the only one in the entire building which was not destroyed. Some of the glass in the doors and windows of this room were cracked by the heat and some of the varnish on the woodwork was blistered, but the woodwork did not take fire.

Fig. 6 is a view from the interior of one of the shutters on the third floor. It will be noted that the shutter is in good condition, and that the walls have already been replastered.

Fig. 7 is a rear view of the Volkman Building, and shows three shutters side by side. This building was only partially damaged. The windows were protected by wired-glass and metal frames: these were considerably damaged and will have to be replaced.

ARCHITECTS AND FIRES.

[It is characteristic of current thought in the United States to read articles in "Insurance Engineering" on the question of architects and municipal engineers ignoring the question of fire-resistance. We quote the articles just as they stand, and whilst these, of course, contain exaggerations, there is a certain truth underlying the arguments that both architects and municipal surveyors might well take to heart.]

The Beautiful *v.* the Fire-Resistive.

Most architects and municipal engineers have a happy way of ignoring questions of durability and resistance to fire in building construction, subordinating these and other matters to the question of artistic effects. A recent editorial in the "Municipal Journal and Engineer" says:—

"American cities are earnestly striving after the beautiful, the artistic and the attractive. Everywhere evidences of this can be seen, in public parks, in civic centres, in improvement societies. But with this general demand for the City Beautiful comes an appreciation—by the few, at least—of the lack of men able to advise and plan for the desired results. There are a few specialists in landscape architecture and park designing; a few architects with a genius in the grouping of buildings who can design noble civic centres; a few artists with the brush or chisel who can be relied upon to secure æsthetic effects in the designing and location of fountains, statuary and other decorative appurtenances of a city. But who is to see that all these are not spoiled by numerous hideous blots in the shape of, say, red fire hydrants of ugly outline, stiff and obtrusive poles for supporting lamps and wires, cast-iron abortions of fountains and the like?"

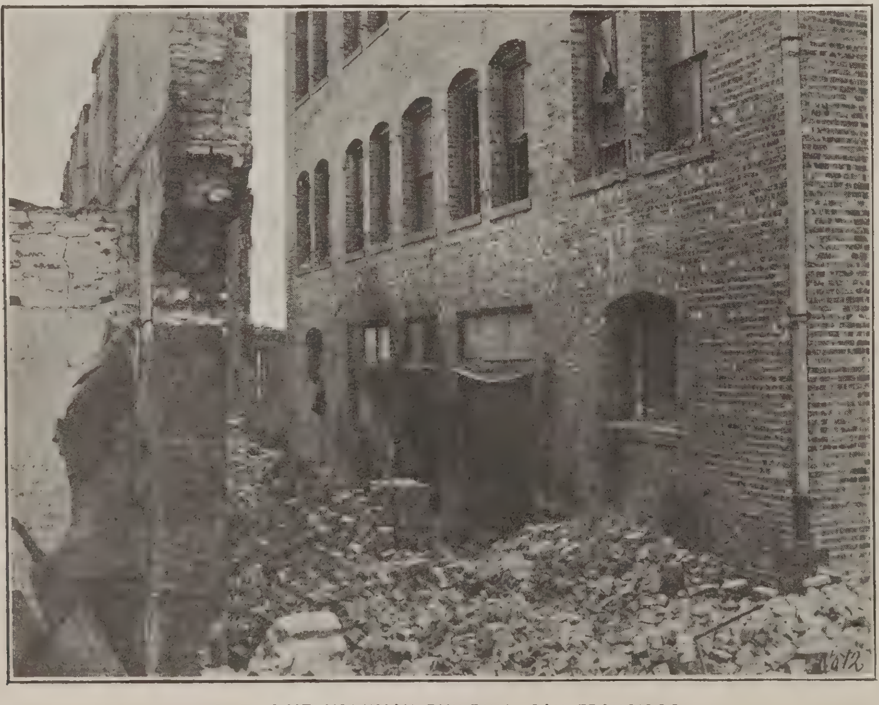


FIG. 7.—THE VOLKMAN BUILDING, SAN FRANCISCO.

Red fire hydrants may be unsightly, but so are ruins of fires. Of the two, fire hydrants are more useful in preserving a city intact than artistic effects in architecture. "The Insurance Press" makes the following comment on the editorial quoted above:—

"The City Beautiful is a fine idea, but, like some other admirable projects, may make haste too rapidly. A more immediate question is the City Fire-resistive.

"In the highest art utility and beauty go together. There is no loftier principle in city building than consideration for the safety of life and property. Fire hydrants are sometimes 'hideous blots.' So are fire escapes. Nothing is much uglier than a tank on a roof. Interiors are spoiled, in the view of art connoisseurs, by the heads of automatic sprinklers. Chemical fire extinguishers and coils of hose are not things of beauty. Few of these things can ever be made lovely to look upon.

"Let us have 'noble civic centres,' 'æsthetic effects' and 'decorative appurtenances' if we can get them without a diminution of safety. But let us yearn for nothing 'beautifying' unless it is substantial and fireproof, or as nearly fireproof as can be secured. What is wanted is the engineer's type of beauty, and not the architect's, unless we can have a happy blending of the two. 'The Insurance Press' votes for safety first, for beauty incidentally."

Improvement of Old Buildings.

A far more serious question is, What shall we do with the hundreds of thousands of old buildings that are filled with defects that favour conflagrations? Again, "Insurance Engineering" quotes from its contemporary, "The Insurance Press," in answering that question:—

"Is it not a significant fact that none of the conflagrations from which this country has suffered started in buildings that even pretended to be fireproof?

"Has not the value of the various simple improvements in building construction recommended by the fire underwriters been lost sight of in the excitement following conflagrations?

"When a fire door, put in on the recommendation of underwriters, prevents the spread of fire, should not the fact be bulletined to the business world as a reminder to business men of the value of such a simple device?

"When a watchman, employed on the recommendation of underwriters, discovers a fire before it has had time to spread and extinguishes it with some approved appliance for the purpose, also suggested by underwriters, should not these facts be heralded to the insuring public?

"If merchants who have followed the recommendations of the underwriters have profited by so doing, why should not other merchants experience the same benefit by following the same example?

"The modern system of schedule rating offers to every man inducements for lessening the chances of a serious fire on his premises. It shows him what certain defects in the construction of his building cost him in insurance premiums, not to mention the uninsured loss that may be caused directly or indirectly by those defects. Briefly, schedule rating shows the property owner how his rate is made by himself and not by the fire insurance companies.

"Much has been said of late years about reducing conflagration dangers. Where is the work to begin to make it effective? Is the future safety of our large cities to depend on the fire-resistive character of *new* buildings? Will not the new buildings be menaced by the old ones that are full of defects which favour spreading fires? Will not the old buildings outnumber for years the new ones whose owners have accepted the lessons of conflagrations?

"Public fire departments and modern apparatus for extinguishing fires will always be indispensable, but they must be helped by making all buildings fire-resistive in certain particulars. 'The Insurance Press' does not advocate reconstruction—that is impossible—but by following the simple and effective remedies of the underwriters for preventing the spread of fire from room to room, from floor to floor and from building to building, a great deal can be accomplished at a comparatively slight cost considering the credits to be secured in insurance rates for these improvements, as well as the almost certain immunity from serious fires.

"There are large numbers of buildings that have been adapted to different occupancies without due regard for the fire hazard. These are among the worst examples of conflagration breeders. They are nether one type of construction nor another. Radical improvements are needed in such structures to make them even reasonably safe."

The Responsibility of Architects.

By F. W. Fitzpatrick.[*]

"Insurance Engineering" has certainly done its share towards elucidating to our people the folly of poor construction, its appalling cost and the various and sundry means that should be taken to *lessen* those losses—to *eradicate* them, doing the best we can, will take at least a generation's time. With the different lessons of our recent great conflagrations still in mind, might it not be well, not in any carping or fault-finding spirit but simply as a curative expedient, for us to ask "Who's to blame?"

The people put up the money for building, they direct in a general way what they want in the matter of space, &c., but, manifestly, they cannot be expected to also direct how building should best be done to prevent its destruction by fire, or in the matter of its sanitation, heating, &c. That is the province of the architect. He is the expert who is supposed to know all about and to control all those details. In the vernacular, it is "up to him." How well he has acquitted himself of the task can best be illustrated by the fact that in all our country there are about 11,500,000 buildings; their value is something like $14,500,000,000, and of all that number there are but 4,000 whose authors even claim as at all fireproof. In most cases that fireproofness is limited solely to the structural or skeleton part of the building. In all else they are about as flimsily constructed as is the most "ordinary" building. Of those 4,000, there is but one building, the Underwriters' Laboratories in Chicago, where all the known methods of fireproofing are assembled under one roof, but *one* absolutely fireproof building in this great country of ours. The others of even the 4,000 are damageable from 20 to 90 per cent. of their cost value.

The Folly of Limited Efforts.

It would seem that the average architects, or even the best of them, believe that by fireproofing the structural steel with hollow tile or with the various substitutes, concrete, &c., &c., some sort of occult transformation takes place and they are relieved by that one act from doing anything else in the fire-proofing line. If you don't think that that is so glance at the illustrations and the several reports of the San Francisco fire. Had $10,000,000 more been spent originally on the buildings of that city, it would have meant the saving of at least $100,000,000 in the conflagration; or, to be more specific, if the architects of the thirty-five so-called fireproof buildings had exercised judgment enough to have spent $600,000 more on their construction, or rather shifted that amount from wonderful ornaments and fine marbles to the greater essentials of fire-prevention, they would have saved those buildings intact, buildings in which at least $9,000,000 destruction has been wrought. Simpler still, had the single precaution been taken of protecting the windows of those buildings, an additional expenditure or a shifting of not over $60,000, from frivolous ornamentation to that necessity, the interiors and contents of those buildings would have been intact to-day!

With those facts clearly before me and a long list of others, the accumulation of twenty-odd years' most intimate association with the practitioners, there is enough to justify me in the claim that our architects show lack of skill, if not actual stupidity or criminal negligence, in planning their buildings. I suppose this sounds like *lèse majesté*, or treason, or something of that sort, but the facts are there, and the sooner someone brings them forcibly to popular attention the sooner may we expect that conditions will be ameliorated.

The architects' training is somewhat against them. Their earliest lessons are in the artistic line and all too often the schools, the older practitioners and all the influences surrounding the youngsters conspire to give them a haughty disregard of things merely practical. Let the bids on any building come to more than the owner intends spending and watch the architect pare down to get within the limit. He will cut off the fireproofing even of the steel, he will rip out the very bowels of that building if he can only preserve what he deems to be his beautiful exterior intact and certain mantels and other little internal fussiness. He forgets that real beauty is Truth and that the very first purpose of any building is to have its interior adapted to the business for which it was built, its exterior merely clothing that interior, permanent and undamageable by the elements, and then what is left of the money used for a chaste adornment or ornament of the exterior or of the interior.

The Jealousies of Specialists.

Our civilisation has grown very complex and with alarming rapidity, and our architects have not kept up with the progress. To put it plainly, the job of building has become too big for nine-tenths of them, and the other tenth, who know more than their confrères, are generally too busy in the "executive functions" of the profession, committees, dinners, social functions, the getting of large commissions, &c., &c., rather than paying attention to details, so that the world is really not over-much benefited by their versatility.

True, the structural engineer has been brought into requisition and also the heating expert, the sanitary man and so on, as auxiliaries, aids to the architects. But each one makes the mistake of believing that *his* profession is the leading one and that all else should be subservient to it. He is jealous of everyone else and the architect, the executive officer, has a dickens of a time reconciling these various experts, adjusting their squabbles. One would think that the structural engineer's province would be to help out the architect in a general system of fireproof construction, but, bless you, he himself knows mighty little about it. He is long on learned dissertations about the modulus of elasticity in concrete, he can beautifully arrange the riveting of his columns and girders and adjust to a hair's breadth the factor of safety, he knows how to figure out reinforced concrete—particularly the one hundred and twenty-seventh patented system, his own—so that there will be less cement and far greater strength than in any other system, but he will never advise the architect to close his stairs and elevators, to make smaller his units of space, to protect his windows, or anything of that sort. He brushes all that aside; it is not engineering to him.

The Function of the Insurance Engineer.

It resolves itself into this, that if the architects themselves don't know enough—and they certainly have not shown any wonderful acumen in the matter heretofore—about fire-prevention to properly devise and plan and construct their buildings, and are too jealous of their own high prerogatives and supposed all-covering knowledge to call in an expert who *does* know how to adjust and connect all the branches of building so that one does not vitiate the other, then it is clearly "up to" the owners of projected buildings to take the matter into their own hands and have their plans passed upon by a real fire expert, such as Mr. Reed of the Committee of Twenty, for instance, before they begin actual operations. These operations frequently consist, so to speak, in figuratively shoving hundreds of thousands of dollars into a rathole. Business men take the very greatest precautions before going into ordinary business deals. If it is real estate, they have the titles examined and everything done up in excellent form; if the law, they carefully select their attorney, and he must be a man who knows all about that special kind of litigation and has made a success of it. When it comes to building, a transaction that involves oftentimes a hundred-fold as much as his other deals, he will confide himself body and soul, as it were, to a young cousin of his wife's, to the protégé of some friend or other more or less unknown, and, very possibly, incompetent fellow, whose principal equipment in a professional way is the sign over his door, "Architect." The result is that fire costs us, for smoke, fire departments, money wasted in insurance, &c., a sum equal to 5 per cent. yearly on $10,000,000,000! In other words, that sum might be termed the amount we have invested in stupidity!

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[*] Consulting Architect, Washington.

What the Future Promises.

Under proper direction, in a generation's time or so, if most of our flimsy buildings have been destroyed and a better class built, really full-fledged fireproof construction, with its attendant increased first outlay, will not be so necessary. In a town where all the buildings are simply incombustible, the precautions we have to take now to make a building fire-resisting will not be needed. There is so much inflammable all about us, fire and conflagration hazards are so great, so ever present, that the very top-notch of precautions have to be taken with the buildings that are built now, whose owners have any desire to preserve them. It is a condition that has been brought about by our own folly, or, to be more specific, our architects' rank incompetency. We have to face that condition, and for a time go to an extraordinary expense and exercise the utmost care to make our buildings superlatively fire-resisting. The architect has not done so heretofore; that he will or can do so hereafter is a matter of conjecture. Engineers, nine out of ten of them, are purely and solely structural specialists. The fire experts are few and far between, and the chances are that the great bulk of our people will have to be satisfied with insisting upon their architects complying with the generalities of the art of fireproof construction, as set forth in "Insurance Engineering" and the other technical journals that really give any attention to that most important subject.

If a man desires to learn another language than his own the proper caper is to get a teacher who knows that language thoroughly, the country, its customs and all about it; if he cannot afford that, then he can at least get a smattering, a dab at that language, perhaps enough to keep him from being led astray in that strange land if he visits it, by studying "French at a Glance" or some of those many other text books that are indeed most helpful. A little knowledge of a subject, some very ancient authorities to the contrary notwithstanding, is infinitely better than absolute ignorance thereupon. It will at least show one how much more there is to be known and perhaps give him a proper appreciation of how very little he does know, and an incentive, a willingness, to acquire more if it is at all gettable.

Door and Window Openings.—At the Birmingham Insurance Institute an important paper was read this month by Mr. Ellis Marsland, district surveyor of Camberwell, who, at the invitation of the Institute, discussed his various methods of protecting door and window openings from fire. Mr. Marsland's paper was illustrated by a fine collection of lantern slides, showing photographs taken at the tests of the British Fire Prevention Committee, and from actual fire ruins.

PROTECTION AGAINST FIRE FROM LIGHTNING.

We have heard so much of what our own Lightning Research Committee considered to be advisable with a view to safe-guarding buildings against lightning that it should be of interest to observe what is considered advisable in the United States by those who are more or less directly interested in fire protection—namely, the members of the National Fire Protection Association, many of whom have considerable fire insurance experience.

We therefore reproduce the latest specification recommended by the National Fire Protection Association for the protection of buildings against lightning, and we should welcome correspondence on this subject, the importance of which is still quite underrated in this country.

Suggestions for Protection of Buildings against Lightning.

1. —Note.—Protection against lightning is advisable on country buildings, on isolated buildings, and on all buildings wherever located having elevated features such as tall chimneys, steeples, high peaked or gable roofs and flag poles. Since complete protection of any building will depend largely upon its location, size, shape, construction and nature of the occupancy, definite requirements cannot be laid down for the installation of lightning conductors, but the following general suggestions should give, under most conditions, reasonable protection:—

2.—*General Suggestions for Installation.*

(*a*) One rod with proper air and earth terminal is recommended for unit of ground area as follows:

Flat or peaked roofs of metal, one for each 3,600 sq. ft. of ground area.

Flat or peaked roofs other than metal, one for each 1,600 sq. ft. of ground area.

Note 1.—Air terminals should never be more than 50ft. apart. Ordinary type flat or peaked metal roof approximately 60 by 60ft. ground area or same type other than metal, approximately 40 by 40ft. ground area, will require one rod and earth terminal, but sharp corners wet with rain, such as gables, dormers and wings, diminish resistance and may require protection in greater proportion to area.

Note 2.—A low, broad building of greater area than 75 by 100ft. can best be protected by an additional rod through the centre of the building.

(*b*) The air terminal to be placed at the highest point of the roof or structure. Where there are two or more gables or other projections above the roof of equal or nearly equal height. each to have an air terminal, and all to be bonded together over the high part of the roof to make the system a unit.

Note 3.—More than one air terminal can be connected with the same ground by the regular conductor, provided other conditions in these rules are not violated. See Rule 5 (*a*).

(*c*) All exterior metal work to be connected with the lightning rod system below the line of the metal itself or be separately grounded by regular conductor. This includes metal roofs, gutters, ventilators, railings, chimney hoods and stacks.

(*d*) All interior masses of metal, such as girders, beams, water piping and any structural iron or steel, but under no consideration gas piping, to be securely connected to the system at their highest and lowest points, the connecting bonds being the regular conductor. It should be borne in mind that conductors and bonds throughout their entire course should always incline downward.

Note 4.—Where a building contains gas piping, the iron pipe on both sides of the gas meter to be securely bonded around the meter by conductor, being careful to make secure electrical connections between the pipe and bond. See Rule 6 (*a*).

(*e*) Where trees stand so close to a building that branches overhang or approach very close to the roof, a conductor with proper earth terminal to extend along the trunk of each tree to near the highest branch top, fastened by a band around the branch or trunk and equipped with a cluster of points. If extreme protection in such cases is desired, wires may be strung from tree to tree across the roof of a building, with sufficient slack to permit of trees swaying, and all connected together. In either case the building should also be equipped with proper lightning rod.

Note 5.—If wires are strung across a building from tree to tree they should not be smaller than No. 6 B. & S.

3.—*Materials.*

(*a*) Conductors may be made of soft copper in either sheet or tape form, or in form of stranded cable, weighing in each form not less than 6 ounces per foot. Where cable form is used no single copper wire to be less than No. 12 B. & S.

Note.—One inch iron rod can be used to connect iron ground with copper conductor, the conductor terminating above the surface of the ground.

(*b*) Conductors may be made of iron in either sheet or tape form, or in cross section, representing "star" shape, weighing in each form not less than 2¼lbs. per foot. Iron, when used in any form, must be thoroughly galvanised to prevent corrosion, and may be also painted, if desired.

4.—*Air Terminals.*

(*a*) To be rods of iron or copper not less than ¾in. in diameter, with point cone-shaped, and height of cone equal to the radius of the base.

(*b*) One foot below the point there should be a casting holding four copper points, each 6ins. long and ¼in. in diameter, or a group of points may be placed on the end of the terminal.

(*c*) Large chimneys should have a band of copper or iron not smaller than the conductor around the top below the corbeling, with terminals securely attached thereto extending 3ft. above the chimney. The terminals to be placed at intervals of not exceeding 4ft. along the circumference of the chimney; each terminal to be connected individually with the band around the chimney.

(*d*) All metal chimneys or stacks to be thoroughly grounded.

(*e*) Terminals should extend not less than 3ft. above flat or peaked roofs or chimneys, and be firmly secured in an upright position.

5.—*Conductors between Air Terminals and Ground.*

(*a*) All joints to be made mechanically and electrically secure, and then soldered.

(*b*) To be run down side of building where best ground is obtainable, preferably on the side most exposed to rain.

(*c*) Not to be run nearer than 5ft. to interior piping unless absolutely unavoidable.

(*d*) To be run as straight as possible, avoiding all turns of radius less than 1ft., and to incline downward throughout its entire course.

(*e*) In case of a chimney other than iron, 50ft. high, two conductors on opposite sides should be provided. Where a chimney is in excess of 50ft. in height an additional conductor should be provided for each additional 50ft. or fraction thereof, spacing the conductors at equal intervals around the circumference of the chimney.

Note.—Added protection can be secured by providing extra bands around the chimney at intervals of 25 to 50ft., all such bands to be securely connected to all conductors.

(*f*) Should never be insulated, but fastened securely to the surface to be protected by clamps of same kind of metal and of sufficient strength in mechanical application to prevent conductors from working loose, at the same time allowing for expansion of the metal.

(*g*) Must never run through iron pipes.

6.—*Connections.*

(*a*) With iron piping or castings, preferably to be made by screwing a brass plug into same and fastening conductors securely to it, then soldering. Another method is by using a soft clamp having a cross section of not less than ¼in. by 1in., which will securely grip the pipe by means of tightening a machine screw or bolt not smaller than ¼in. in diameter. The conductor to be soldered to a lug in this device.

(*b*) With copper ground, by riveting and soldering, the connection then being coated with asphaltum paint.

7.—*Grounding on Earth Terminals.*

(*a*) A copper plate, not less than 2ft. by 3ft. by 1-16in. buried in permanently damp earth below the frost line and not less than 4ft. below the surface, with 3ins. of crushed coke or charcoal underneath, and the same material above to within 6ins. of the surface of the ground.

(*b*) An iron casting, so shaped as to have a number of pockets or cups facing upward, should have not less than 6 sq. ft. of surface. Should be buried in not less than 6ins. of scrap metal and coke under, and 6ins. over same.

(c) A third method of grounding, which may be used if neither of the above is possible, is to dig a trench not less than 3ft. long and 1ft. wide, leading away from the building and deep enough to reach permanently damp earth, but not less than 4ft. deep, and cover the bottom with a layer of scrap metal or well burned coke, about walnut size, in which a "star"-shaped casting securely attached to conductor shall be embedded.

(*d*) Another very satisfactory method of grounding is to connect the earth terminals with municipal water pipes, and where such connections are permissible, connection can be made as specified under No. 6, by connecting into the bell at the joints or where piping is wrought iron, by the clamp, as specified.

(*e*) An iron pipe not less than 10ft. long, 2ins. inside diameter and ¼in. thick, perforated with ½in. holes at intervals of 3 or 4ins., or with slots ¼in. by 10ins. at intervals of 10ins. A hole must be dug 10ft. deep and not less than 6ins. in diameter, the pipe placed in the centre and the hole filled in with crushed coke or charcoal about pea size.

Note.—A proper ground is absolutely essential and permanently damp earth is absolutely required. If same cannot be found at base of conductors, they should be extended underground (buried below the frost line in a wooden jacket) to a point where proper ground can be found. Where 1-in. iron rod is used to connect conductor and ground, same need not be encased in a wooden jacket.

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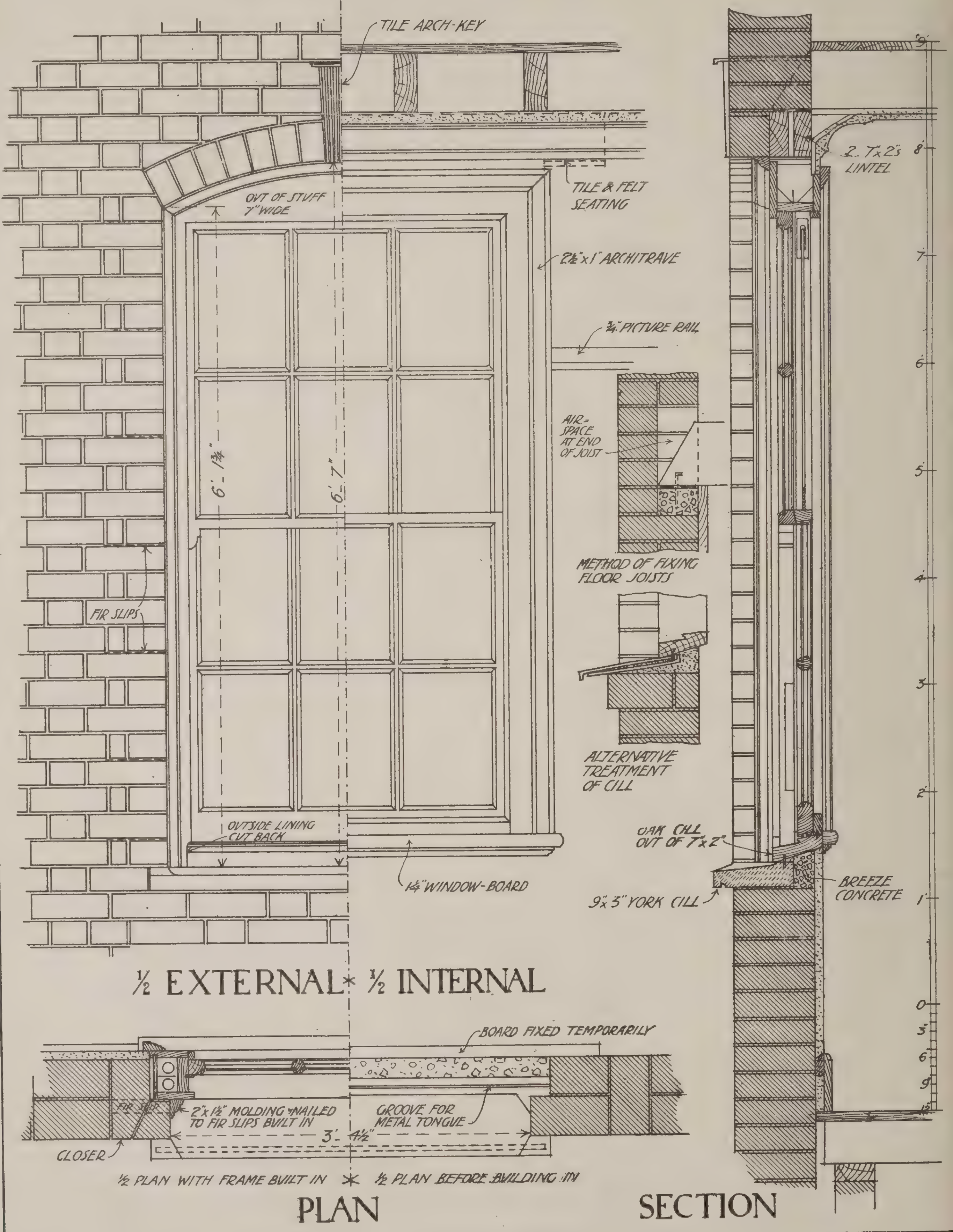
A Competition for Readers. We are doing very well, but we want to do still better. We want to increase our circulation. We welcome comparison with our contemporaries and we have proof that The Builders' Journal is appreciated, in the fact that it has achieved a foremost position among professional and trade weeklies. We know the merits of The Builders' Journal, but however good a thing may be there is always a certain amount of public inertia to overcome. Our readers at present are influential members of the architectural profession and building trades. We feel convinced that The Builders' Journal only requires to be better known in order that its circulation may increase enormously. We are, of course, not without ideas as to how this is to be done, but we should like to have other suggestions. We, therefore, offer a prize of five guineas for the best suggestion as to how we can increase our circulation. The feasibility of the suggestions will be considered by the editors, whose judgment will be final. No doubt our friends will be glad to help us with ideas, and to see us adopt their proposals, whether they win the prize or not; therefore we reserve the right to adopt any of the suggestions which we receive. Suggestions should be submitted before or on January 10th, addressed to the Editors of The Builders' Journal, 6, Great New Street, London, E.C., and the envelopes marked "Circulation." We shall announce the result of our decision in our issue for January 16th.

A COMMON SASH-WINDOW.



SASH WINDOWS.

Acquaintance with the likes and dislikes of the average dweller in suburbia leads to the conclusion that the sash window is one of his most cherished institutions. A sometime unhappy experience of the draught-inducing qualities of cheap, flimsy and ill-designed casements has apparently been responsible for this attitude. Be this as it may, however, the sash window, despite its rattling propensities, is popular, and it is a matter for regret that it appears usually in such hopeless ill-proportion and clothed in such poor and mean detail in the dwellings of the multitude. The accompanying drawing does not profess to show the best manner of constructing a double-hung sash and frame; but in it some attempt has been made to present a decently-proportioned and simply-detailed window, suitable for use in buildings of the cheapest description. Since cheap buildings must be erected, and need not necessarily be bad because they are cheap, no further excuse seems needed.

All architects will agree that the sash window looks its best when set in straight reveals, exposing the outside lining and approaching within a few inches of the external face of the walls, as in Georgian work. To this position, however, the 9-in. walls of the majority of suburban houses do not lend themselves; moreover, the obvious convenience of finishing the sash frame flush with the internal face of walls, and so abolishing jamb linings, makes the 4½-in. reveal preferred. There is no necessity why this should always confer the poor and mean appearance generally inseparable from its use. If the break in the reveal be made 2¼ins. instead of 4½ins. (thereby incidentally improving the brick bond) the sash frame, when built in, will expose a sufficient margin to allow a 2-in. × 1½-in. moulding to be carried round the sides and top of the opening, greatly improving its appearance, and having a distinct practical value. This moulding is fixed after the joint between reveal and frame has been pointed up, and is nailed to fir slips about 6ins. × 1½ins. × ⅜in. built in the mortar joints about 1ft. apart during erection. It keeps the pointing permanently in position and checks a good deal of draught which would arise if it were able to fall away (as it usually does).

The depth of jamb available in 9-in. walls is insufficient for a sash frame more than 5¼ins. thick—*i.e.*, 4½ins. plus the thickness of plastering. This is made up by ¾-in. outside lining, two 1¾-in. sashes, ⅜-in. parting bead and 1-in. inside bead. These, after working, will make up about 5¼ins. thick. Outside linings less than 1in. thick are best only nailed to the pulley stiles, as the working of a groove so near the free edge is liable to cause the lining to curl away from the sash, which so becomes loose. If the outside lining be cut back at the foot level with the face of the pulley stile, it prevents the lodgment against it of water falling on the wood sill, and so removes a frequent cause of decay, as all "dilapidation" surveyors can testify. An American device, saving both labour and material, is shown in the oak sill.

The stone sill is no larger than absolutely necessary; the space at the back of it can be filled in with breeze concrete, a board fixed temporarily across the opening being all that is necessary while filling in. For the alternative tile sill, tiles having a continuous nib are best—forming both a groove for water-bar and a drip on the front edge. Tiles of this pattern are made by several manufacturers — Messrs. Collier, of Reading, for instance.

In building in the frames galvanised hoop-iron cramps should be nailed to the linings about 18ins. apart, coming in the joints of the brickwork. A half-brick face arch built in cement, with a good camber, is stronger than inferior gauged work, and looks simple and workmanlike. To keep the extrados of the arch at the skewback level with a brick course, as shown, rather than the intrados, entails less difficult cutting of the spandrel filling bricks, otherwise there would be a birds'-mouth.

The sashes are shown with bars. The unreasonable opposition often taken to such desirable adjuncts leads one to suppose that most people spend all their time indoors looking out of windows. Besides the undoubted disturbance of scale (and consequent belittlement) which large undivided sheets of glass produce in the appearance of a small house, such sashes are bound to have a very short life, as they depend wholly on their tenons for stiffness. Division by reasonably-spaced bars effects a great improvement in all respects.

The window illustrated is suitable in proportion for a storey 10ft. from floor to floor—the limit under most by-laws for 9-in. walls.

One other detail not actually referring to the sash may be mentioned. To avoid bedding timber in the brickwork, the upper floor joists are secured by the following method, which is found to work well in practice:—The course below the level at which it is intended to bed the joists is a facing course with snapped headers. A board is fixed temporarily on the inside of the wall and the space between this and the facing course filled in with breeze concrete. When this has set, and before laying the floor joists, two rows of stout hoop-iron are laid on the breeze as a lateral tie, and the joists nailed to the breeze fillet between the two rows. The hoop-iron is carried across all openings, and although wood lintels are shown in the drawing, cast breeze concrete is preferable and quite easily made on the works. The method of cutting ends of joists saves 4½ins. in each length of timber, leaves an air-space at the end of each joist without lessening the bearing, and would allow the floors to fall, in case of destruction by fire, without levering over the walls above.

GOTHIC VAULTING.

At the students' meeting of the Manchester Society of Architects held on December 11th Mr. R. W. Orme read an interesting paper on "Gothic Vaulting." After giving a concise historical sketch of the evolution of Gothic architecture, and stating that it was the desire of the old builders to obtain a fire-resisting roof which first led to the adoption of a stone vault, the lecturer dealt with various kinds of vaults, commencing with the groined vault of the 11th century. Diagrams of each form were given. It was explained that the introduction of the pointed arch obviated at once the difficulty of vaulting oblong compartments, having horizontal ridges. The multiplication of the tierceron ribs led to the "rib and panel" vault, and later to the "conoid" form of the 15th century vaults. In conclusion the lecturer showed how the rib (which was such an important factor in early vault construction) lost, in later vaults, all its construction value, the vault becoming either all rib, as in the cloisters at Gloucester, or all panel, as in Henry the Seventh's Chapel at Westminster, which, although a marvellous piece of stone cutting, yet unfortunately lost the true essence of Gothic vaulting.

In the discussion that followed it was suggested that reinforced concrete ceilings might be treated in a somewhat similar manner to Gothic rib construction. The rather illogical method of covering a stone vault with a wooden roof was also noted, and it was considered advisable to let the vault tell its own tale, both internally and externally.

Notes on Competitions

University College of North Wales, Bangor

In the limited competition for the new buildings of the University College of North Wales to be erected at Bangor, the design of Mr. Henry T. Hare, F.R.I.B.A., has been selected by the Council on the recommendation of the assessor, Sir Aston Webb. The buildings are estimated to cost about £200,000. His Majesty the King is to be invited to lay the foundation-stone next summer.

London County Hall.

The recommendations of the Establishment Committee in regard to the competition for the London County Hall were brought before the Council last week, but the consideration of them was deferred. It seems hardly likely, however, that any change in the conditions will be made by the Council, so that architects may soon expect to be able to apply for copies. The competition will, of course, be the biggest held for years past.

List of Competitions Open.

Deposit for conditions given where known.

DATE OF DELIVERY	COMPETITION.
Dec. 31	LABOURERS' COTTAGES AT DUBLIN.—Premiums of £50, £30 and £20. Particulars from A. R. Barlas, secretary, L.G.B. Offices, Dublin. No deposit.
Dec. 31	DUAL SECONDARY SCHOOL AT GOOLE.—Premiums £50 and £25. Particulars from James W. Johnson, clerk to Governors, Council Offices, Goole. Deposit £2 2s.
Dec. 31	NURSES' HOME AT GENERAL HOSPITAL, WOLVERHAMPTON.—Particulars from J. Stephen Neil, House Governor and Secretary, General Hospital, Wolverhampton. No deposit.
Dec. 31	BATHS AT ASHTON-IN-MAKERFIELD.—Limited to architects in Wigan and Leigh Poor Law Unions. Particulars from A. Sykes, clerk, Council Offices, Ashton-in-Makerfield. No deposit.
1907 Jan. 5	SECONDARY SCHOOL AT GUISELEY, LEEDS (for 200 scholars).—Name by this date to M. Rennard, secretary to Governers, Guiseley, Leeds.
Jan. 12	LAY-OUT OF RIDDRIE ESTATE, GLASGOW.—Premiums of £75, £50 and £25. Particulars from A. W. Myles, town clerk, City Chambers, Glasgow. No deposit.
Jan. 19	LIBRARY AT PLYMOUTH.—Premiums £50, £30 and £20. MUSEUM AND ART GALLERY AT PLYMOUTH. Premiums £25, £20 and £10. Limited to local architects. Particulars from Borough Librarian, Plymouth
Feb. 1	CHILDREN'S HOSPITAL AT SUNDERLAND.—Premiums of £100, £50 and £25. Particulars from T. Robinson, secretary, Infirmary Offices, Bank Buildings, Sunderland. Deposit £1 1s.
Feb. 16	CONGREGATIONAL CHURCH, SCHOOL AND MANSE, GRIMSBY.—To cost £8,200. Premiums of 25, 15 and 10 guineas. Particulars from E. L. Bridge, Fish Docks, Grimsby. Deposit £2 2s.

MODERN ARCHITECTURE IN BERLIN.

By R. A. Raven.

Berlin is the third city of Europe. It is growing with astonishing rapidity, both in wealth and size. The wealth and fashion of Berlin, as in London and Paris, live in the West End, and the West End is spreading like fire. One great avenue cuts it in two, the Kurfürstendamm. This avenue has, along its eastern half, been finished for some time, as far as the handsome Kaiser Wilhelm Memorial Church—a converging point for the movement of the rich quarter. Westward, the Kurfürstendamm leads in a straight line to the rich suburb of Halensee and its still richer pendant, the Grunewald Kolonie. It is a great and important street, and in a few years will be still more important. Down the middle runs a three-lined ride for cavaliers, and double tramway lines. On each side of these are broad thoroughfares, flanked by wide pavements and lined with big houses. Everything has been well arranged by the authorities, except that they made no architectural arrangements for the building of the houses; and here is the eyesore. They are great ambitious four-, five- and six-storeyed palaces, these houses—so big that, though the street is long, there are not many of them. But it requires no very discerning ability to see that their architecture has no distinctive quality but that of shameless effrontery. The education necessary for the criticism of them is gained by looking through a few photograph albums of the famous buildings of the world, from the Pyramids to the Tower Bridge. A man armed with this minimum of education and a sense of humour will have an amusing quarter of an hour as he enters the Kurfürstendamm.

Let us take a few examples. Kurfürstendamm No. 50, the largest and most flagrant, occupies the obtuse angle at a corner where a side street enters the big avenue, and is imposingly arranged, with a central block at the corner and a wing at each side. Here is a brief résumé of the architecture of the central block :—The bottom storey, a restaurant, is unadorned, and bears no trace of the enormous weight it carries; only out of its upper part appear volutes, in the shape of lions, which support the chief features of the next storey. These features are, first, four enormous Corinthian columns, resting on the lion volutes, and not on Mother Earth, and supporting nothing; secondly, a large rotunda, of no visible use; thirdly, four Greek statues, arranged here and there on open spaces on the wall. As the eye now mounts to the third storey, it finds itself no longer in Greece, but in Potsdam or Dresden, in a maze of rococo and baroque ornament. One storey higher, and near the empty tops of the great Corinthian capitals, is an inscription in large advertisement-shaped letters, each about 2ft. 6ins. high, "Built A.D. 1901." We are now near the roof, but as all corner houses in the Kursfürstendamm boast some sort of tower (it seems a matter of good form to do so), we find an elongated dome, in shape and style somewhat similar to that of the Frauen church at Dresden. This, however, does not suffice; above this dome is another, a Gothic one—so far as it is possible to make a dome look Gothic; and, to finish the building off, a gilt-winged Victory stands on tiptoe on the Gothic dome.

So much for the centre block. The two side blocks are more elaborate. There are rococo "Atlases," supporting imitation urns, with imitation smoke columns. Greece is represented by both Doric and Corinthian columns, divided conveniently halfway to make room for a balcony, and flanked by massive caryatides. Other styles are not omitted. There are Romanesque windows; two sphinxes from Egypt, supporting heraldic shields—a pretty fancy; and above the red-tiled roof Night and Morning, copied from Michael Angelo's Medici tomb in Florence; and finished off with a Cleopatra's Needle.

But this is only one house. No. 42, for example, has a brick understorey, divided in two by a rich Byzantine doorway; it has sphinxes, cupids playing on harps, and satyrs blowing on pan-pipes; and at the top a huge bare gable, covered with an enormous "Kate Greenaway" fresco.

No. 47 has more Egyptian ware, two enormous columns supporting a vast roof, and themselves borne lightly, in one hand, by a reclining Rameses. No. 48 is remarkable for a palisade of griffins on a Doric peristyle; No. 65 for a design of naiads and two-bodied sphinxes; No. 63 for another of cherubs and peacocks; No. 183 for a Theomachy between the upstairs windows; No. 180 has Doric capitals with Egyptian bases, obelisks standing on the roof-line, each with a pair of plaster watch-lions, instead of watch-dogs, chained to it; the inevitable tower, and the sanguine inscription "Fortuna Fortes Adjuvat." But why continue? Why dwell on the Gothic pinnacles supporting owls of Minerva, the gable windows made to represent dragons' mouths, the portico with broken Gothic tracery, broken to make it look antique?

But it is past a joke. The sad history of it all is clear. A simple, uneducated people, the Prussians; an inrush of money into the country after a victorious war with the one nation who could teach them refinement; rapid commercial success; mushroom millionaires, who require gorgeous and flashy houses to live in; slum architects finding themselves called on to build palaces; Berlin folk charmed with the result, and making a point of sending visitors to see the fine buildings in "modern style" at Halensee—and, above all, in the Kurfürstendamm. The whole thing has been done lightheartedly; but in a few years there will be grief and remorse. The cultured Berliner, now hardly to be found outside the University, will have made his way and will have supplanted the retired army officer and the rich "Kaufman" from their leading position in society. Then there will be weeping, wailing and gnashing of teeth, and repenting in sackcloth and ashes. Then will the wretched Kurfürstendamm be the "Champs Elysées" of expanded West Berlin. And then, too late, will arise a writer with the eloquence of Ruskin and the sarcasm of Macaulay to pour scorn, contempt and the vials of wrath upon the shameless, undignified heads of those who to-day are erecting these hideous things.

Notes and News

Change of Address.—Mr. Horace Farquharson, architect, has moved from Elizabeth Street, Eaton Square, to 41, Montpelier Square, Knightsbridge: telephone No. 3457 Western.

New County Court Offices at Swansea are to be erected at the corner of Fisher Street and Frog Street. The work is to be put in hand at once, and is to be completed by the end of next year.

Smithfield Market Extension. — The foundation-stone of a building which will largely extend the area of the Central Markets, Smithfield, was laid last week. The work is estimated to cost £20,000.

New Baths in Glasgow were opened last week. They are in Cameron Street, Springbank, and have cost £8,000. There are 21 hot baths for men and 4 for women, with washhouse accommodation for 56 washers.

Spinning Mill for Todmorden.—A spinning mill to accommodate at least 80,000 spindles is to be built at once at Todmorden in a part of the Burnley Valley known as Harehill. A well-known Manchester mill architect has been engaged to prepare plans.

Exhaust Ventilation in Factories.—Numerous examples of well-planned installations of exhaust ventilation in factories, selected by Commander Sir H. P. Freer Smith, R.N., late Superintending Inspector for Dangerous Trades, have now been brought together in book form.

Messrs. L. Whitehead & Co., Ltd., builders and contractors, desire us to state that the serious fire which occurred at their store yard in Dorset Road, London, S.W., has not affected their workshops, stables and main yard at Portland Place North, Clapham Road, and in no way inconveniences them, except as regards loss of stock.

Bilston Town Hall.—The large baulks of timber with which Bilston Town Hall has been shored up since May last consequent upon subsidences due to old mine workings, as is thought, beneath the building, have now been removed. The foundation has been made secure by steel girders beneath the building and the roadway.

At the Palatine Road Congregational Church, Manchester, extensive alterations have been made under the direction of Mr. John Swarbrick, A.R.I.B.A., the general contractors being Messrs. Peace & Norquoy. The choir has been rearranged, the high gallery removed, and a new organ case erected, together with choir stalls and canopies in sequoia wood. The organ has been built by Mr. J. J. Binns, of Bramley, Leeds.

Blackfriars Bridge Widening.—The contract for the widening of Blackfriars Bridge has been let to Sir William Arrol & Co., of Glasgow, at £203,000. The bridge is now 43ft. wide, and the improvement will add another 30 ft to the roadway. The pavements will remain 16ft. wide. A curve will extend the north abutment of the bridge on to the Embankment, and the tram-lines will follow it. Steel caissons filled with concrete will be sunk by compressed air to form the basis of the granite piers, which will be connected by steel girders of extra strength. It is expected that the work will occupy two years and a half.

Architectural and Building Events of 1906.

THE year 1906 marks the completion of some large buildings of more than average importance. In London the huge block of the new War Office in Whitehall, designed by the late Mr. William Young, has been carried to completion by his son, Mr. Clyde Young, in conjunction with Sir John Taylor, of H.M. Office of Works. This is undoubtedly the most important building finished this year in the metropolis. In point of size, it ranks as one of the largest Government buildings in this country, but, excepting the front of Whitehall, with its fine colonnade, the exterior can hardly be considered worthy of its opportunity, though within the building the grand staircase has certainly a very fine effect. The other large Government building further down Whitehall is still enveloped in its scaffolding, but it has made considerable advance during the past twelve months and the shell is now practically complete. Most noteworthy on the exterior is the large tower in Great George Street, and the success of this lends point to the argument that was raised in Parliament as to the completion of the late Mr. Brydon's original design in this particular.

Another important London building finished this year is the Central Criminal Court in Old Bailey. Mr. Mountford's design for the building was adopted in competition, and the work as executed is a tribute to his ability. The building indeed has a very imposing appearance, and the sculpture by Mr. Pomeroy—more especially the startling figure of Justice which stands above the dome—adds great interest to the exterior. Within the building marble has been very extensively employed, and the great hall on the first floor beneath the dome is a notable achievement, with its lunette paintings by Prof. Moira and Sir William Richmond: it is not often that we see such a collaboration of architecture and painting in this country; the result at the Central Criminal Court, however, is eloquent of the advantages to be secured by such collaboration.

There have, of course, been a number of other important buildings completed in London during the year—the Ritz Hotel in Piccadilly; the companion block to Mr. Norman Shaw's building of New Scotland Yard; the Alliance Assurance building at the bottom of St. James's Street; the Hearts of Oak building in the Euston Road; and the Ecclesiastical Commissioners' offices at Westminster: but for details of these and other buildings we must refer readers to the pages that follow.

In the provinces undoubtedly the most important building finished during the year has been the magnificent block of new City Hall and the Law Courts in Cathays Park, Cardiff. These two buildings offered a great opportunity, inasmuch as they are erected in an open park with none of the usual restrictions of site and lighting, but it will be generally admitted that Messrs. Lanchester and Rickards have made fine use of their opportunity: they have been especially successful in regard to the sculpture work which is so important a feature of the exterior: this sculpture is the work of a band of young men of pronounced abilities, and under the controlling influence of the architects their work has reached a very high level.

Another great building completed this year is Marischal College, Aberdeen. Mr. Marshall Mackenzie, the architect, was here dealing with an old building, but in his granite structure, strong buttressed and restrained below and bursting above into fretted battlements and pinnacles, there is none of the old stock Gothic, but new work full of vigour; a majestic tower dominating the whole.

The King's Sanatorium at Midhurst, Sussex, must also be counted among the most important buildings of the year. Quite apart from its admirable planning, it calls for attention as a piece of brickwork design, while the unique open-air chapel connected with it is a most interesting and cleverly-arranged building.

To the list of Liverpool's buildings must be added the new Cotton Exchange and the new Bluecoat School, both completed this year—the former, with its great colonnaded front, at once commanding attention, the latter quiet in its general effect, but most refined in every detail.

Newcastle has also had two important buildings completed this year—the Infirmary and the Armstrong College.

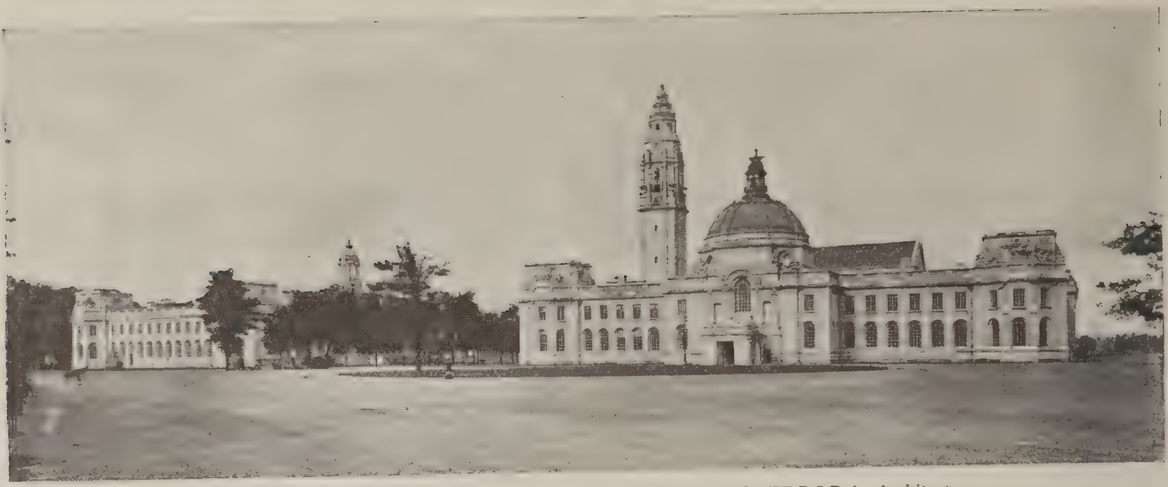
Manchester calls for notice by reason of the new central fire station recently finished; Birmingham for its new electricity generating station; Hull for the new general post-office in course of erection; Glasgow for its new parcels post office; York for the large office building of the North Eastern Railway Co.; Northallerton for its very interesting county hall; Bristol for its new central library.

Turning now from buildings to architectural matters, we have to record the election of numerous eminent architects to the Fellowship of the Institute—men such as Mr. Reginald Blomfield, Mr. E. S. Prior, Mr. Halsey Ricardo, &c., who for one reason or another had kept apart from such alliance. These are very noteworthy additions, and they augur well for the future. Included with them among new Fellows, however, one has to note many names which count for little, and we feel that the Associates who have protested so strongly against such wholesale direct election to Fellowship have had good reason in many cases.

During the year there has been the usual crop of competitions, and it is worth remarking that there has not been the familiar hue and cry by comfortably-established practitioners against the evil of it all: indeed, that old protest seems to have died, and we have had instead the very much more satisfactory efforts to secure proper conditions of competition. There have been no particularly large competitions in this country during the year, excepting, perhaps, the Bangor University College, but abroad there has been the competition for the Palace of Peace at the Hague, which ended in the selection of such a farcical design; and in South Africa there have been the large competitions for the new law courts at Cape Town and the Transvaal University College at Johannesburg. The conditions, however, for the new London County Hall have recently been made known and designs have been delivered for the Birmingham Council House extension, which competitions, inaugurated this year, will rank among the largest for 1907.

Three cathedrals have been the subjects of general interest during the year—St. Paul's, by reason of the subsidences at the south-west corner; Winchester, on account of the subsidences at the east end; and Exeter, for the "restoration" work in progress there. Selby Abbey was gutted by fire in September.

The International Congress of Architects held in London in July was the occasion of a considerable amount of mutual congratulation, and was officially pronounced to be a great success. For our own part, however, we could not see that it was of much account as a serious conference of architects. The meetings were very sparsely attended and resolutions which were excellent as originally put were whittled away to nothing in order to meet the wishes of all concerned. But as a social affair the congress was, of course, an immense success.



New City Hall and Law Courts, Cardiff. Lanchester and Rickards, FF.R.I.B.A., Architects.

TOWN HALLS AND MUNICIPAL BUILDINGS.

The new City Hall and Law Courts at Cardiff were opened by the Marquis of Bute on October 29th. The buildings are in Cathays Park, and are designed in a monumental style. Perhaps the finest portion is the central block of the City Hall with its magnificent dome covering the Council Chamber. The dome is crowned by a lead figure of the Welsh dragon, by Mr. H. C. Fehr. On the exterior of the buildings sculpture has been largely adopted, the groups being the work of Mr. Henry Poole, Mr. Paul Montford, Mr. Albert Hodge, and Mr. Fehr. The Assembly Hall is a large apartment with a very rich plaster ceiling by Mr. G. P. Bankart, and some fine electroliers suspended down the centre. The Law Courts block is divided into two main portions—the assize courts and the police courts. The cost of the two buildings was about £250,000. Messrs. Lanchester & Rickards were the architects, their design having been accepted in competition in 1897.

The new City Hall at Belfast was officially opened in September. This great building stands in the centre of Donegall Square, and has cost £300,000. The main façade is 300ft. long, the general height to the top of the balustrade being 55ft., while the four angle towers rise to 115ft., and the great peristylular dome to 173ft. The building provides accommodation for the city officials and their staffs, and also includes a suite of reception rooms for civic functions and a private suite of rooms for the Lord Mayor. The entrance hall, which is 70ft. by 40ft., is approached through a stone porte-cochère and vestibule. Out of the hall the grand staircase rises to the first floor, on which the principal apartments are disposed, these including a great hall, the Council Chamber, reception room, and banqueting hall. Marble and enriched plasterwork have been used lavishly throughout, giving a very rich appearance. Sir A. Brumwell Thomas, F.R.I.B.A., was the architect.

The new Town Hall at Woolwich was opened on January 13th. Externally the chief feature is the tower, while internally the main entrance hall is the most imposing feature: this hall is carried up two storeys, and is lined with marble, the main staircase to the upper floor being at one end. The statue in the hall is of Queen Victoria, and is the work of Mr. Pomeroy. The architect of this building also was Sir A. Brumwell Thomas.

At Northallerton the new North Riding Council Buildings were completed at the commencement of the year. The exterior is carried out in red brick with white stone dressings. The Council Chamber is 45ft. square, and lies at the rear of the building. The total cost of the work (inclusive of furnishing, roads, &c.) was about £33,000. Mr. Walter H. Brierley, of York, was the architect.

On February 27th the foundation-stone of the new Town Hall at Ossett was laid. The building will cost £20,000. Messrs. W. Hanstock & Son, of Batley, are the architects.

New Council Offices at Pontypridd, Mon., were opened on April 11th. Mr. Henry T. Hare was the architect. The cost of the building was about £16,000.

On July 21st the foundation-stone of the new Municipal Buildings at Lambeth was laid. Messrs. Warwick & Hall are the architects.

On July 25th the foundation-stone of the new Municipal Buildings at Bromley was laid. Mr. R. Frank Atkinson, F.R.I.B.A., is the architect, his design having been selected in competition. The cost of the building will be about £20,000.

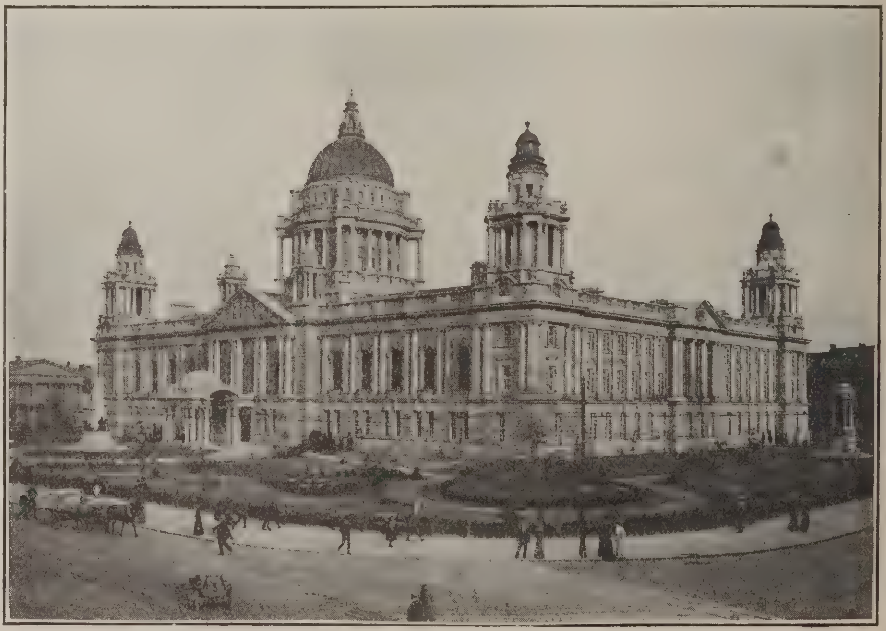
A new Town Hall at Kirkintilloch was erected at a cost of £9,000, from designs by Messrs. Walker & Ramsay, of Glasgow.

On October 23rd the new Municipal Offices at Bodmin were opened. Mr. Reginald T. Buscombe, borough surveyor, designed the building.

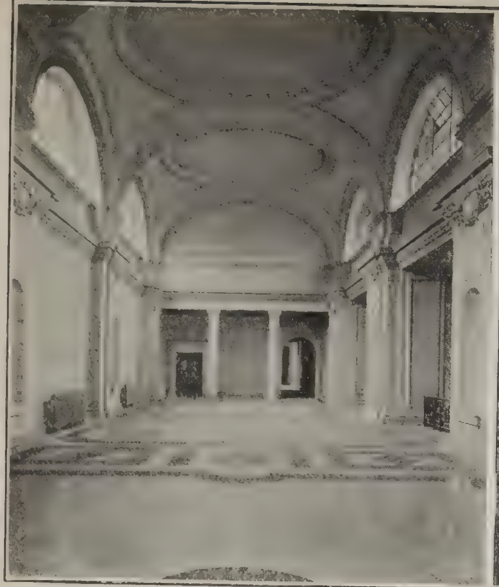
At Bideford the new Municipal Buildings and Free Library were opened on February 7th. Mr. A. J. Dunn, of Birmingham, was the architect. The cost was £6,000.

New offices for the Frimley Urban District Council were erected at Camberley, from designs by Messrs. H. R. and B. A. Poulter, at a cost of £2,339.

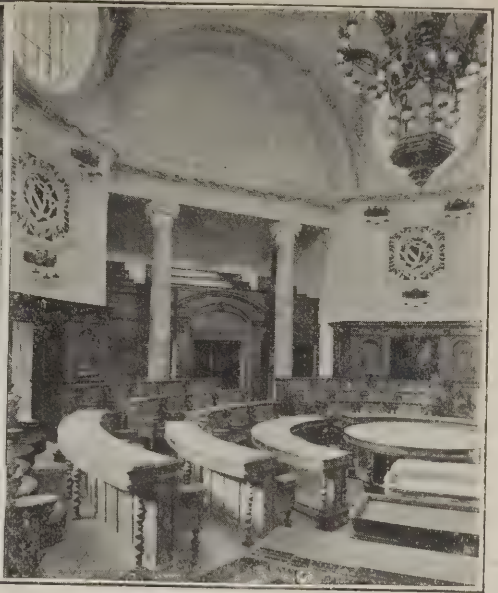
A new Town Hall at Sutton Coldfield was opened on September 19th. The total cost was about £12,000. Mr. Arthur R. Mayston, of London, was the architect. This completes the scheme; the fire station, which forms part of the building, having been opened in November, 1905.



New City Hall, Belfast Sir A. Brumwell Thomas, F.R.I.B.A., Architect.

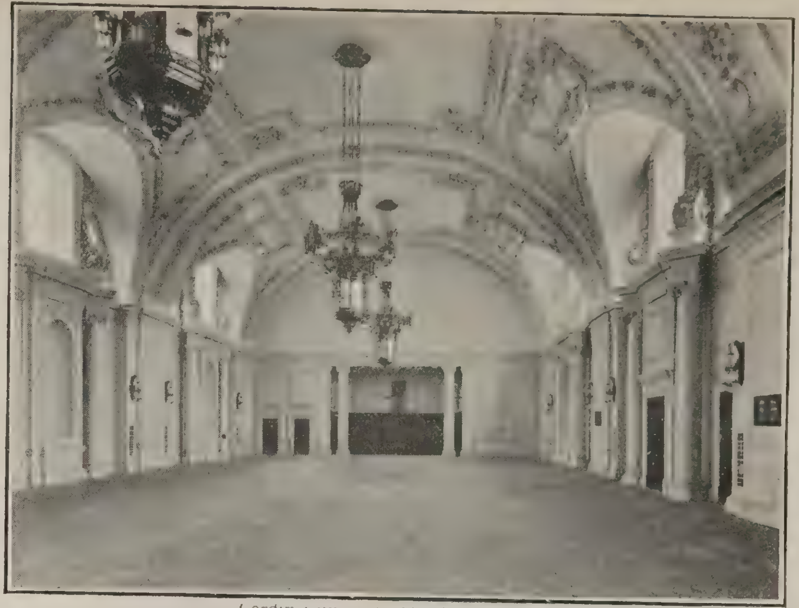


Hall to Law Courts, Cardiff.

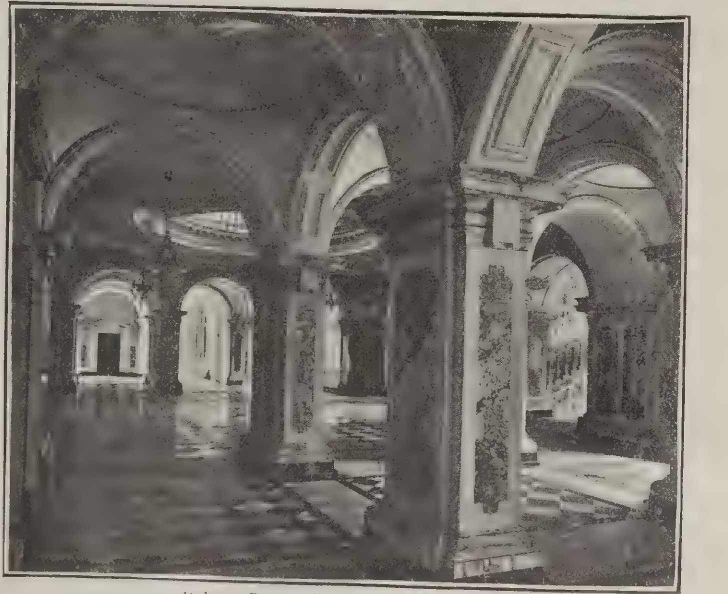


Council Chamber, Cardiff City Hall.

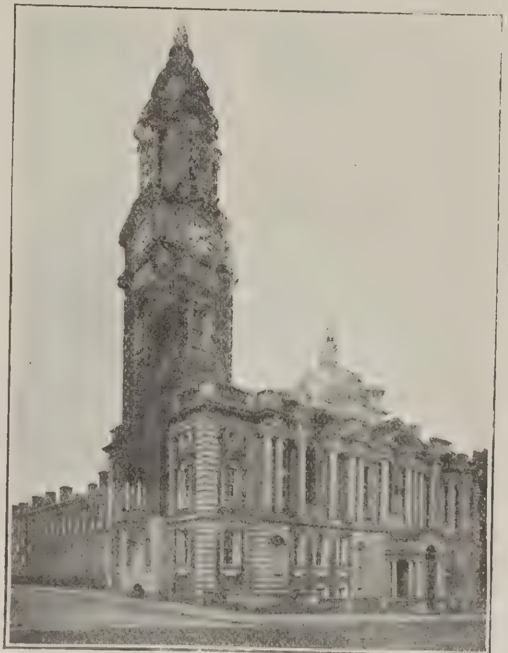
Lanchester and Rickards, FF.R.I.B.A., Architects.



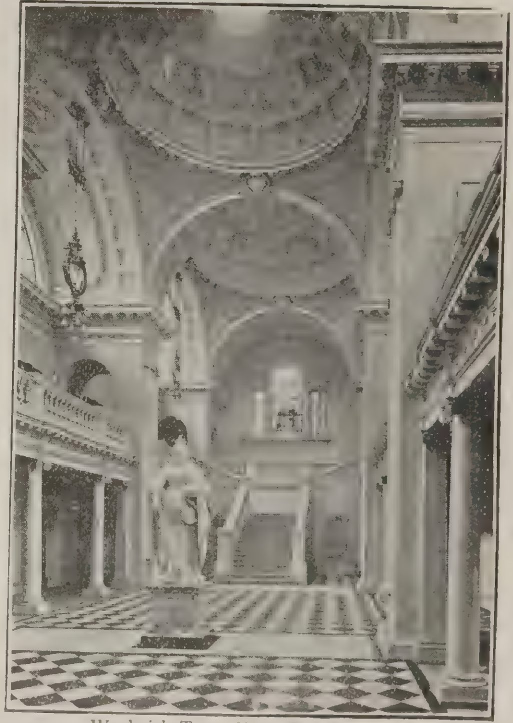
Cardiff City Hall: The Assembly Hall.



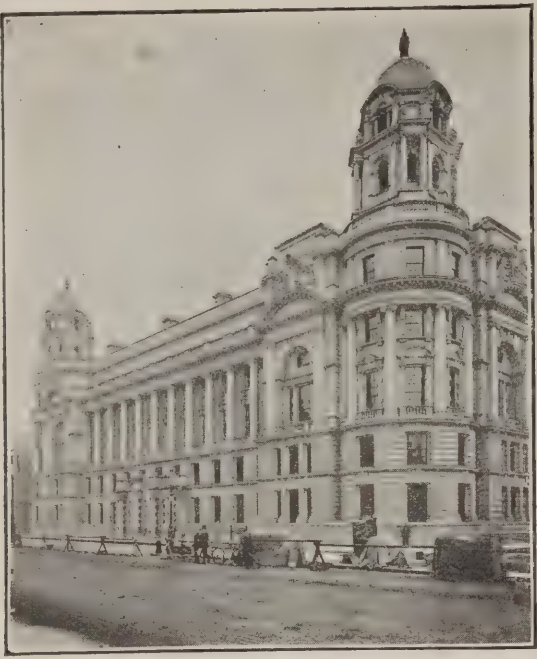
Belfast City Hall: The Entrance Hall.
Sir A. Brumwell Thomas, F.R.I.B.A., Architect.



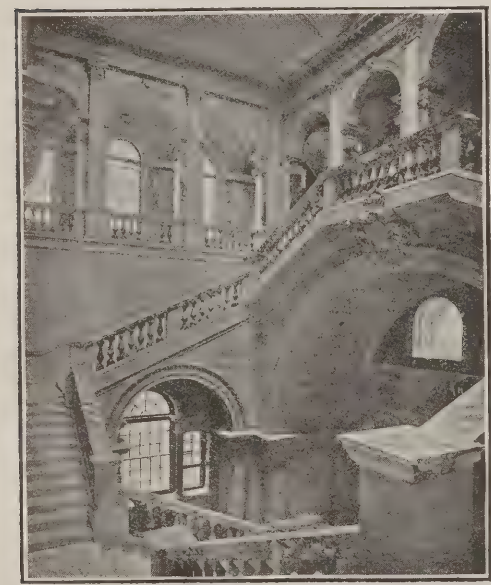
Woolwich Town Hall.
Sir A. Brumwell Thomas, F.R.I.B.A., Architect.



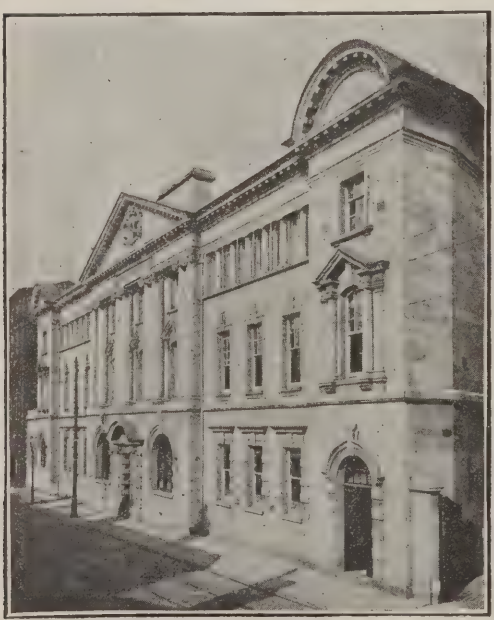
Woolwich Town Hall: The Entrance Hall.



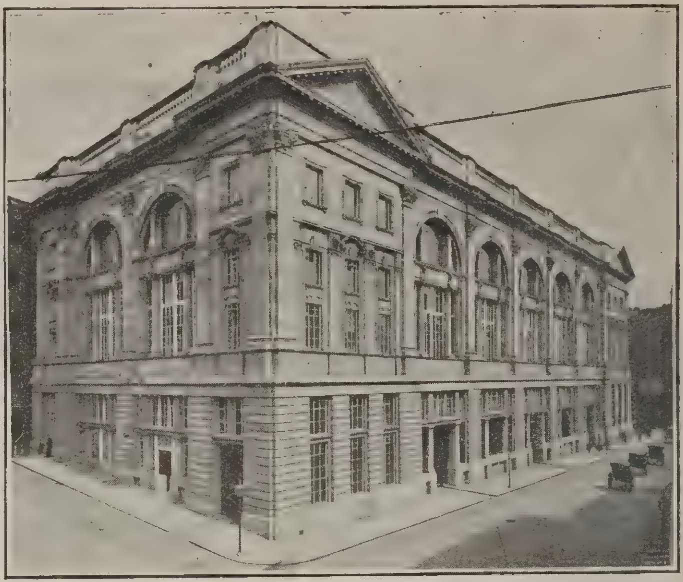
New War Office, Whitehall, London.
The late William Young, F.R.I.B.A., Architect.



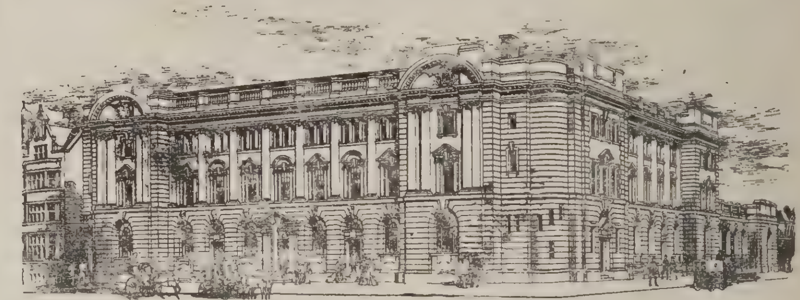
New War Office: The Grand Staircase.



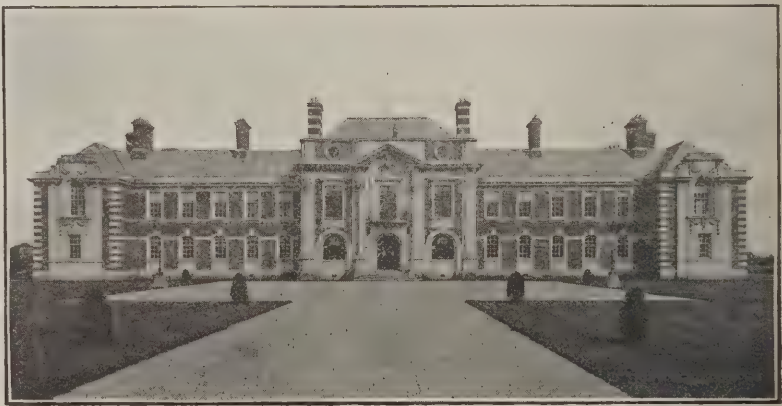
New General Post-Office, Hanley.
H.M. Office of Works.



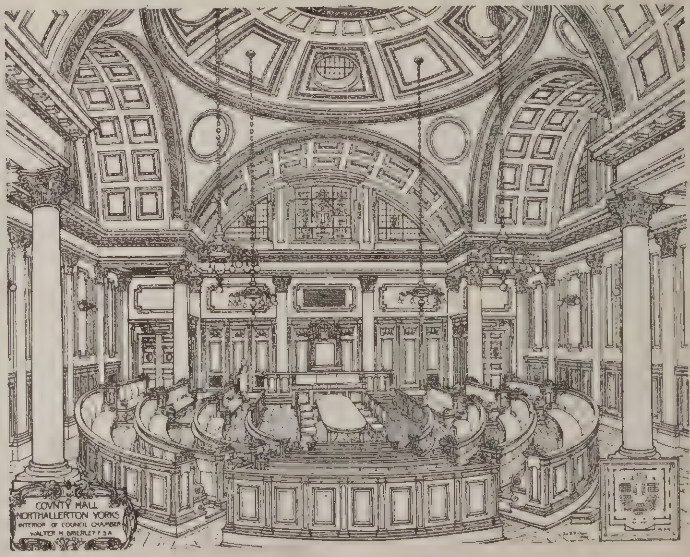
Parcels Post Building, Waterloo Street, Glasgow.
W. T. Oldrieve, H.M. Office of Works.



New General Post-Office, Hull. W. T. Oldrieve, H.M. Office of Works.



New County Hall, Northallerton, Walter H. Brierley, F.R.I.B.A., F.S.A., Architect.



County Hall, Northallerton: The Council Chamber,

CENTRAL CRIMINAL COURT.

The new Central Criminal Court in Old Bailey, London, was completed from designs by Mr. E. W. Mountford, F.R.I.B.A., selected in competition. The building occupies the site of grim Newgate, and is faced with Portland stone. Surmounting the whole is the great dome rising to a height of more than 200ft., and covered by a bronze-gilt figure of "Justice" by Mr. Pomeroy, who also is responsible for the sculpture work on the front to Old Bailey. Dignity and impressiveness have been considered of primary importance, and ornament has been sparingly used. From the entrance hall rises a fine marble staircase to the great hall on the first floor. This hall is the chief internal feature of the building. It is lined with magnificent slabs of marble and embellished with lunette paintings by Prof. Gerald Moira and Sir William Richmond. Following the plan of the ground floor, corridors, lined with marble, branch away on either side, and off these are the four courts—two large and two small, each with its own suite of rooms for counsel, jury, witnesses, &c. The general contractors for the building were Messrs. Holloway Brothers.

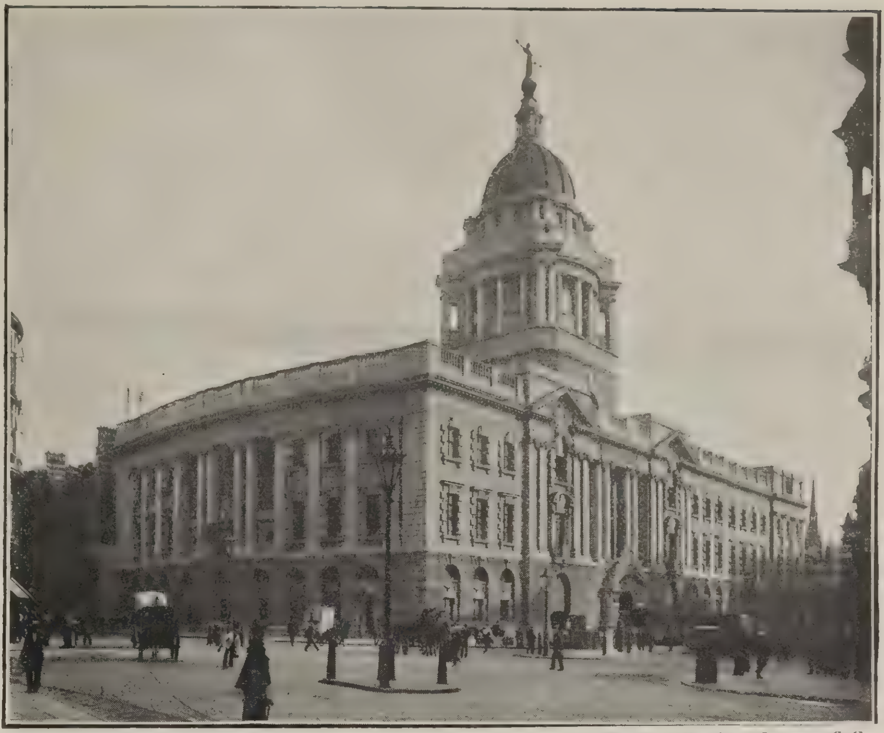


Photo.: *Bedford Lemere & Co.*

New Central Criminal Court, Old Bailey, London. E. W. Mountford, F.R.I.B.A., Architect.

GOVERNMENT BUILDINGS.

The new War Office in Whitehall was completed by November. The building occupies a huge site and is the most important Government building erected in London in recent years. The design was originally prepared by the late Mr. William Young in 1899, but he died before the foundations even were finished, and the task of carrying his building to completion was entrusted to his son, Mr. Clyde Young, in conjunction with Sir John Taylor, of H.M. Office of Works. On the Whitehall front is a fine colonnade, with curved pediments at the corners embellished with sculptured groups by Mr. Alfred Drury, A.R.A. Within the building the most impressive feature is the main staircase, while the rooms allotted to the Secretary of State, the Permanent Secretary, the Council of War, &c., are effectively carried out with oak panelling and finely carved fire-places: there are some magnificent marble mantelpieces from the old War Office. Work on the foundations was commenced in 1899, so that seven years were occupied in the erection of the building. Messrs. Foster & Dicksee were responsible for the work above ground. 26,000 tons of Portland stone was needed for the building, this having been supplied by the Bath Stone Firms, Ltd. Faience and wall tiling were entrusted to Messrs. Doulton & Co., Ltd.

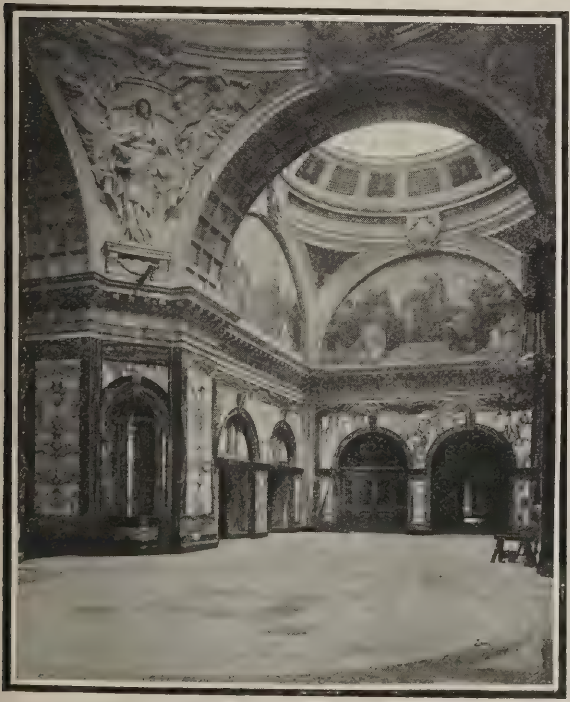
The South Kensington Museum extensions have made good progress during the year. An army of workmen has been engaged and the shell of the buildings is now complete, with the exception of the tower, which is to be 220ft. high. Sir Aston Webb and Mr. E. Ingress Bell are the architects, and Messrs. Holliday & Greenwood are the contractors. The floor-space of the new museum will be about 13 acres, the frontages to Cromwell Road and Exhibition Road being more than a quarter of a mile, taken together. The work will not be completed for another two years. Its total cost will exceed £1,000,000.

It is interesting to note that the floors and domes of the building are reinforced with expanded steel, and all construction fire-resisting. The reinforcement is supplied by the New Expanded Metal Co.

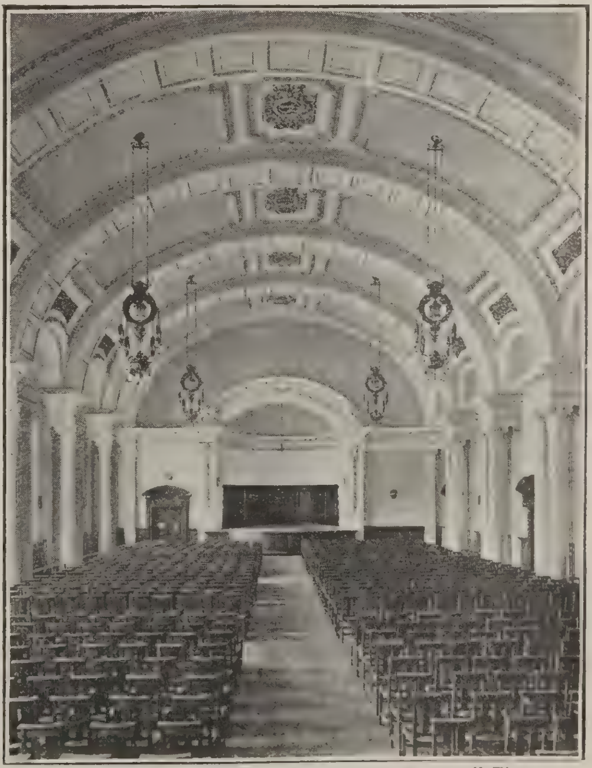
On the site of Christ's Hospital, Newgate Street, London, a start was made with the work of erecting the new G.P.O. buildings, designed by Sir Henry Tanner, principal architect to H.M. Office of Works. It is noteworthy that these important new buildings will be erected on the Hennebique system of reinforced concrete.

A new parcels post building in Waterloo Street, Glasgow, was completed. The building provides large sorting halls, 25ft. high, and has cost £80,000. It has been carried out from designs prepared in H.M. Office of Works, Edinburgh.

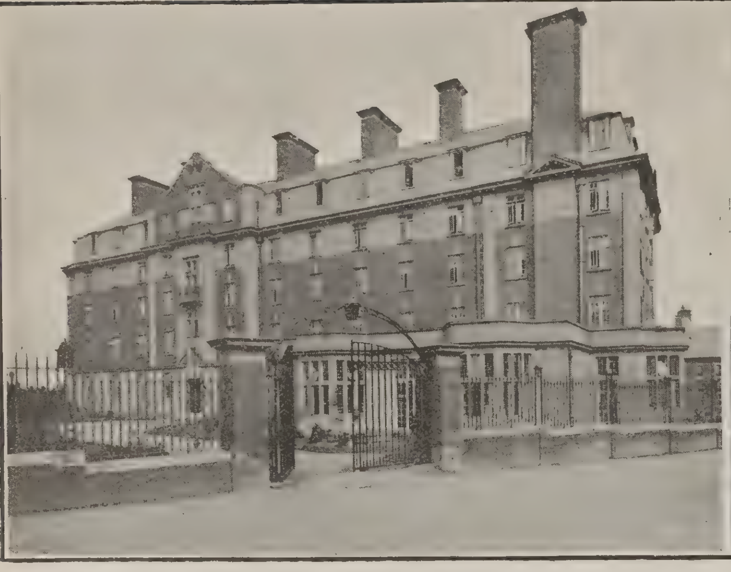
At Hanley a new general post-office was erected from designs prepared in H.M. Office of Works.



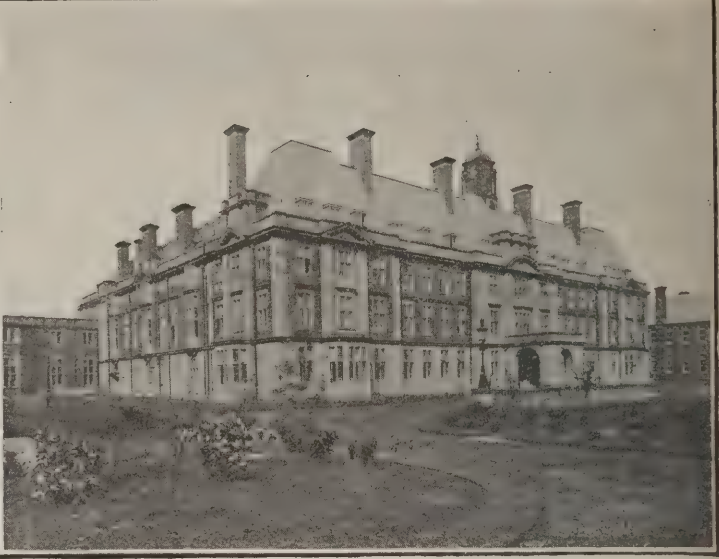
New Central Criminal Court: Hall on First Floor.



Belfast City Hall: The Great Hall. Sir A. Brumwell Thomas, F.R.I.B.A., Architect.



Nurses' Home, Newcastle Infirmary.



Administration Block, Newcastle Infirmary.

H. Percy Adams, F.R.I.B.A., and W. Lister Newcombe, F.R.I.B.A., Joint Architects.

INFIRMARIES.

The large new infirmary at Newcastle-on-Tyne was opened by His Majesty the King in July. The general scheme comprises an administration building centrally placed, with eight ward pavilions grouped on either side, and the usual other buildings disposed about the site. The main front faces Leazes Park. Within the building perhaps the most interesting portion is the hall of the administration block, which is panelled out in teak and leather, with peacocks thereon, and a finely modelled plaster frieze and ceiling. On the highest part of the site is a nurses' home. Mr. H. Percy Adams, F.R.I.B.A., was the architect, associated with whom was Mr. W. Lister Newcombe, F.R.I.B.A., of Newcastle. The total cost of the scheme was £300,000. Accommodation is provided for 400 beds.

In May the Board of Management of the Manchester Royal Infirmary accepted the tender of Messrs. Arnold & Son, of Doncaster (amounting to £239,546), for the general superstructure of the new infirmary, including three large four-storey blocks, and the medical and surgical departments. Mr. Edwin T. Hall, F.R.I.B.A., of London, and Mr. John Brooke, A.R.I.B.A., of Manchester, are the joint architects of the building.

At the Western District Infirmary, Glasgow, a new wing was erected from designs by Mr. J. J. Burnet. This provides three large wards (81ft. by 28ft. by 14ft. 8ins.) with appurtenant rooms.

At the Royal Infirmary, Glasgow, work on the northern wing of the new building was commenced. Mr. James Miller is the architect. The total cost of the entire scheme is likely to exceed £400,000.

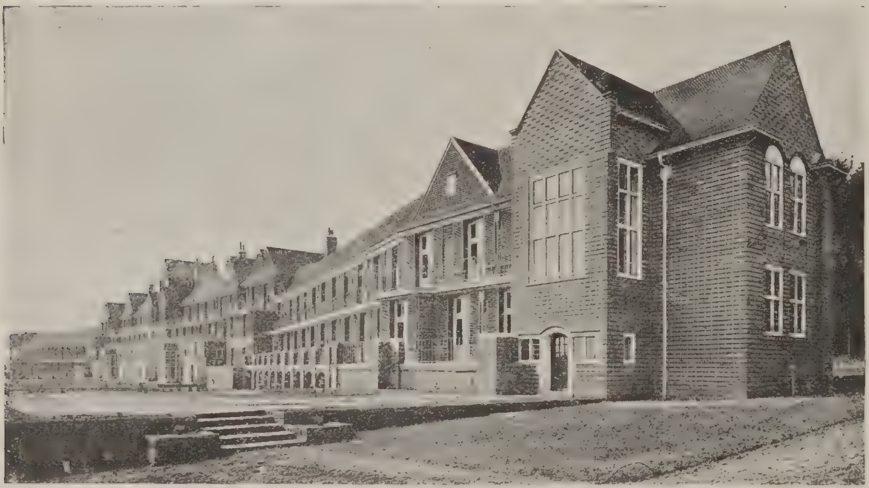
On October 23rd the Read Dispensary, at the junction of St. George's Road and Anchor Road, Clifton, Bristol, was opened. Mr. P. Hartland Thomas, of Bristol, was the architect.

New infirmary buildings at Kingston-on-Sea were erected from designs by Messrs. Clayton and Black, of Brighton.

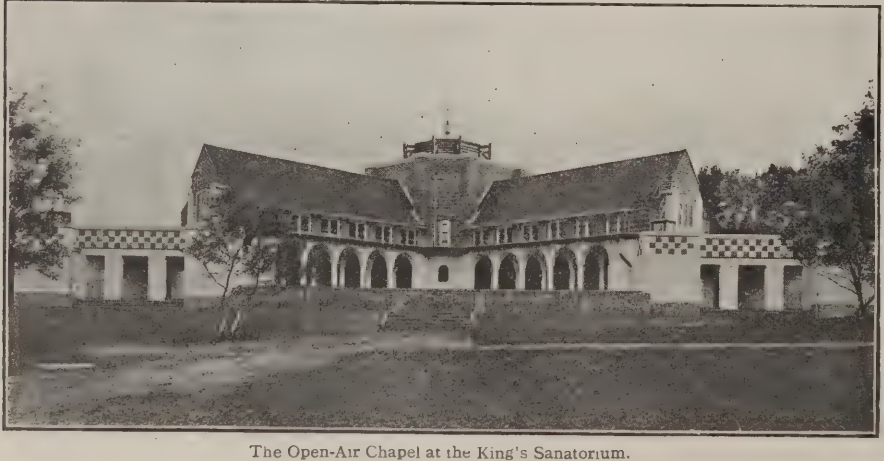
At Leeds the first portion of the extension scheme to the Beckett Street workhouse infirmary was completed. The complete scheme will make provision for 500 additional beds, bringing the total up to about 1,000. The cost is put at £100,000. Messrs. Thomas Winn and Sons, of Leeds, are the architects.

SANATORIA.

In June the King's Sanatorium at Midhurst, Sussex, was opened by His Majesty. It is a very notable building, both as a piece of brickwork design and as embodying the latest principles in the planning of a sanatorium. There are two main blocks—the administration block, facing north, and the patients' block, facing south; the latter comprising a centre portion with wings at an angle. The open-air chapel is quite unique and altogether a delightful example of modern design; on plan it takes the form of a V, the arms constituting two naves, for men and for women, with the pulpit in the "chancel" at the junction. It is interesting to note that the heating of this chapel, as also the dining hall, is carried out on the old Roman system, the floor itself, laid with slabs of York stone, being heated by steam pipes in channels below. Mr. H. Percy Adams, F.R.I.B.A., was the architect. The total cost of the building was about £130,000, this amount including the furnishing, which was carried out by Messrs. Heal & Son, who supplied bedroom suites specially designed to prevent the collection of dust and dirt.



The King's Sanatorium, Midhurst, Sussex. H. Percy Adams, F.R.I.B.A., Architect.



The Open-Air Chapel at the King's Sanatorium.

Sanatorium, Benenden, Kent. William West, Architect.

At Barrasford on the North Tyne a new sanatorium for consumptives was completed at a cost of £20,000. The buildings were designed by Messrs. Nicholson & Dotchin, of Newcastle.

At Blackpool Sanatorium the first portion of the extension was completed. Mr. F. T. Waddington was the architect.

At Benenden, Kent, the National Sanatorium for the working classes was begun, the foundation-stone having been laid in July by H.R.H. Princess Christian. The first section, comprising a block for 38 beds, with separate dining hall, kitchens, &c., will be ready for patients early in the New Year. The buildings have a steel frame filled in with "Frazzi" partition blocks, cement rough-cast externally and finished inside with Sirapite plaster.

ASYLUMS.

A new asylum for the county borough of Newport, Mon., was opened in February. The asylum is at Caerleon, and when quite completed will have cost more than £150,000. Accommodation is provided for 368 patients, in blocks two storeys high. Mr. A. J. Wood, of London, is the architect.

The new asylum for the City of York was opened on April 4th. It is situated at Naburn, about three miles from the city, and has cost £130,000, inclusive of site. The designs for the building were prepared by the city engineer, Mr. A. Creer. Accommodation is provided for 151 males and 211 females.

The Bangour Village Asylum, near Edinburgh, was opened by Lord Rosebery in October. Mr. Hippolyte J. Blanc was the architect.

The extension to the Plymouth Borough Asylum at Wrangaton, providing additional accommodation for 200 patients, was opened on June 6th. The cost of the work was about £32,000. Messrs. Hine & Odgers were the architects.

At Langho, near Blackburn, the colony for sane pauper epileptics was completed in the autumn. It is notable as the first State institution of its kind in this country. Accommodation is provided for more than 300 patients. The total cost (including site, 166 acres) has amounted to nearly £100,000. Messrs. Giles, Gough and Trollope, of London, were the architects, and Messrs. Robert Neill & Sons, of Manchester, the contractors.

HOSPITALS.

To the Rotunda Hospital, Dublin, an addition has been made from designs by Mr. A. E. Murray, F.R.I.B.A.

A commencement was made with the erection of the new buildings of King's College Hospital at Camberwell, for which Mr. W. A. Pite is the architect.

A new fever hospital was completed at Perth. Mr. G. P. K. Young, of Perth, was the architect. The cost was about £12,000.

At Bagnall the new North Staffordshire Joint Small-pox Hospital was erected, at a cost of about £7,000. It accommodates 39 beds. Mr. Elijah Jones, of Hanley, was the architect.

A new infectious diseases hospital was erected at Stanfield, Burslem, at a cost of about £11,000, Mr. Reginald T. Longden, of Burslem, being the architect.

A new infectious diseases hospital at Purdysburn, Belfast, was opened in August. Messrs. Young & Mackenzie were the architects.

ROWTON HOUSES.

"Bruce House," the "poor man's hotel," which the London County Council have built at a cost of £46,000 in Kemble Street, Drury Lane, was opened on July 13th. It contains 699 cubicles (let at 7d. per night), and dining-room accommodation for 400 men, with cooking ranges, &c., for the men's use, as in Rowton houses. "Bruce House" is the third institution of its kind erected by the London County Council, the other two being in Parker Street, Drury Lane, and "Carrington House," Deptford. Mr. W. E. Riley, F.R.I.B.A., was the architect. The cost of erection was about £46,000.

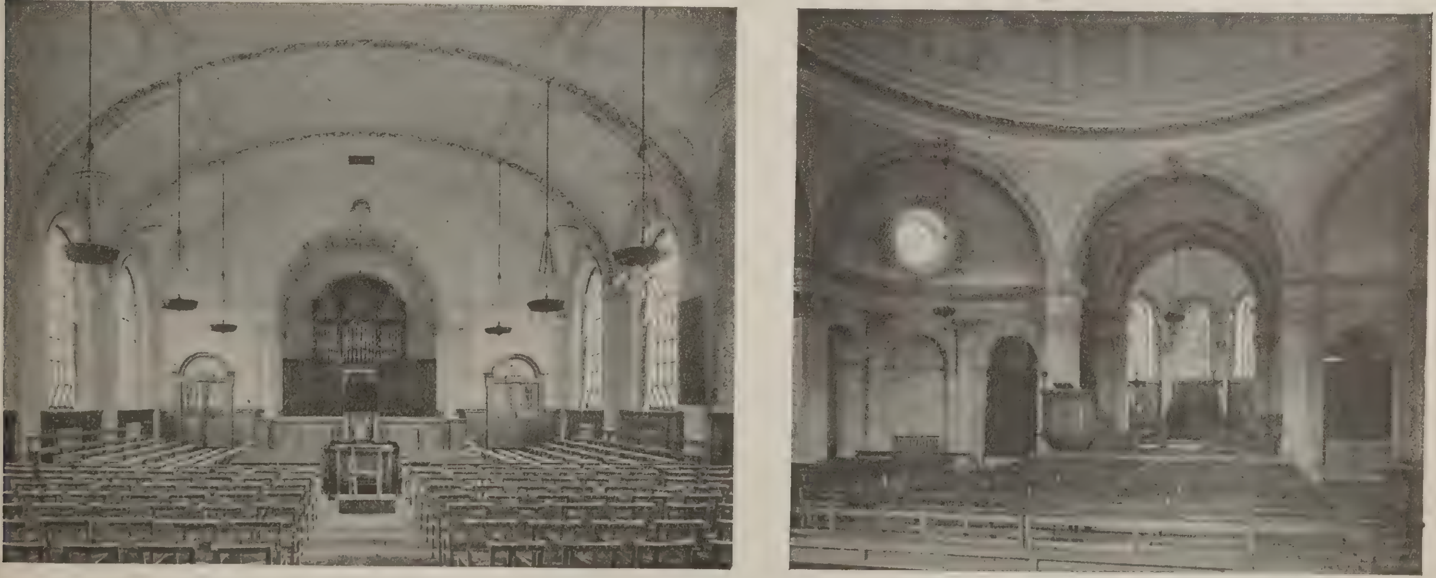
Hopkinson House, a kind of Rowton house for ladies engaged in professional work, was opened in Vauxhall Bridge Road, London. Mr. R. Stephen Ayling, F.R.I.B.A., was the architect. Accommodation is provided for 139 ladies.

At Newcastle-on-Tyne a "Rowton House" was completed. The building is at the top of Dog Bank, Lower Pilgrim Street, and contains more than 250 cubicles. Mr. J. C. Maxwell was the architect.

The ceilings to Brentwood Asylum have been plastered on expanded steel lathing, so as to be fire-resisting.

"Linolite" has been supplied to the new Central Criminal Court, Old Bailey, the new War Office and many other important buildings—by the Linolite Co., 25E, Victoria Street, S.W.

Messrs. Strode & Co. are carrying out the whole of the electric wiring for light and motors at the new "Morning Post" building, London, on their improved galvanised screwed steel conduit system: they are also carrying out the electric light work at the new building of the Alliance Assurance Co. in Capel Court, London, E.C.



The Shirley Hall.

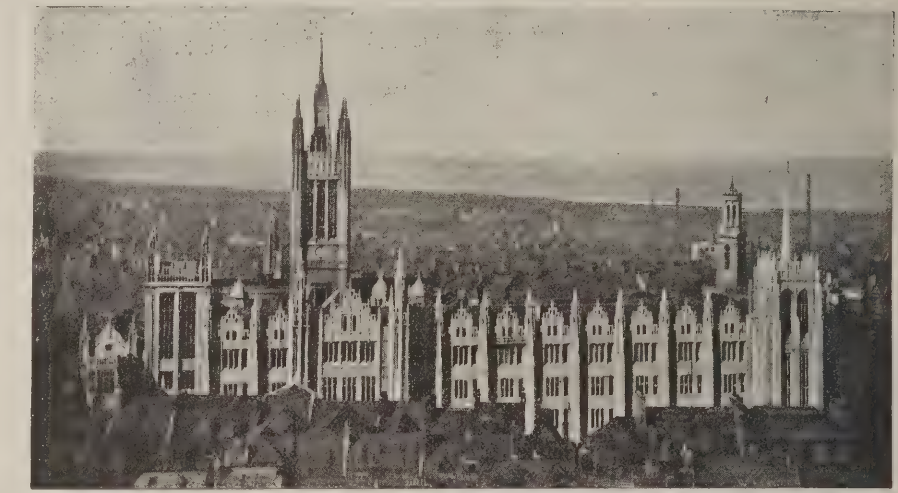
The Chapel.

The New Bluecoat School, Wavertree, Liverpool. Briggs and Wolstenholme, F. B. Hobbs and Arnold Thornely, Architects.

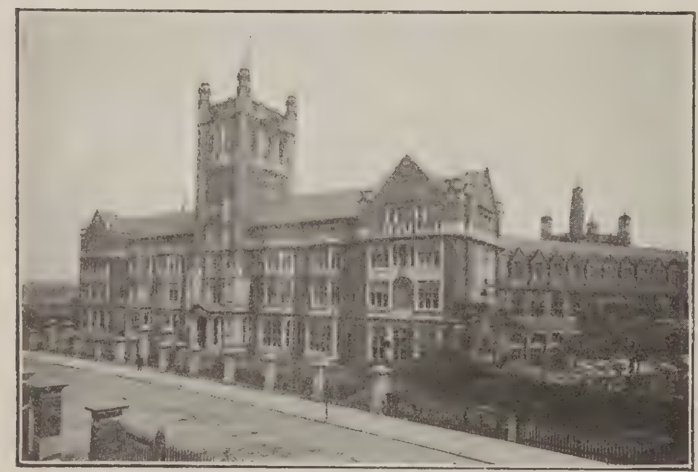
New Schools, King's Lynn. Basil Champneys, Architect.

COLLEGES AND SCHOOLS.

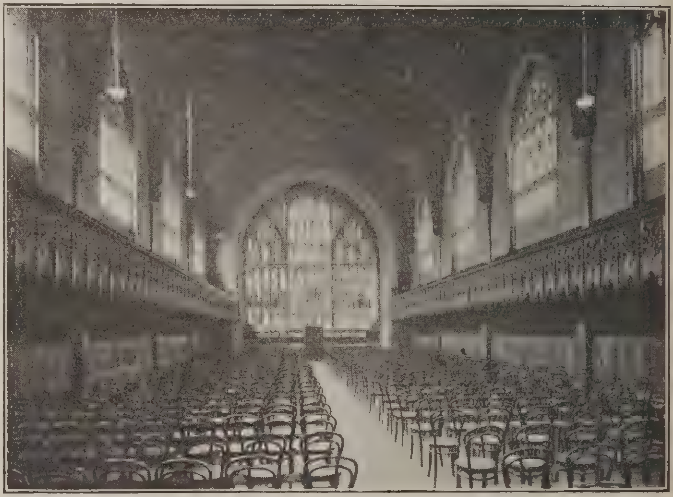
The new buildings of Marischal College, Aberdeen, were opened by his Majesty the King on September 27th. These form a most important group, carried out in light-grey granite, which looks almost pure white when seen in sunshine. Marischal College has a frontage of 400ft. to Broad Street and a general height of 60ft. There is a long series of powerful-looking buttresses, very severe and restrained till they reach the top storey, when they burst into a rich array of pinnacles and frettled battlements; while above all rises the tower. The total cost of the buildings has been more than £200,000. Included in the scheme is a great hall. Mr. A. Marshall Mackenzie, A.R.S.A., F.R.I.B.A., was the architect and Messrs. D. MacAndrew & Co., of Aberdeen, were the contractors.



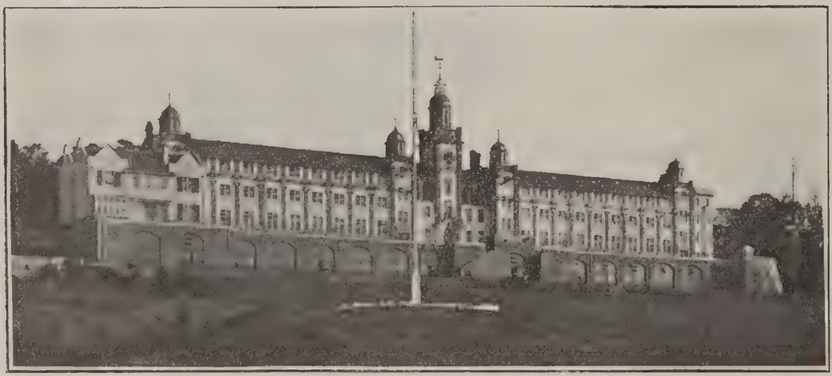
Marischal College, Aberdeen. A. Marshall Mackenzie, A.R.S.A., and Son, Architects.



Armstrong College, Newcastle-on-Tyne.
W. H. Knowles, F.S.A., Architect.

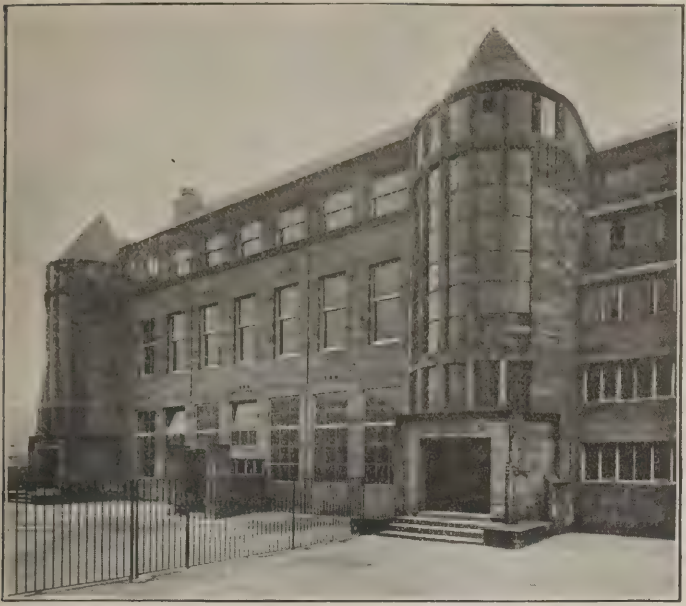


Marischal College, Aberdeen: The Great Hall.

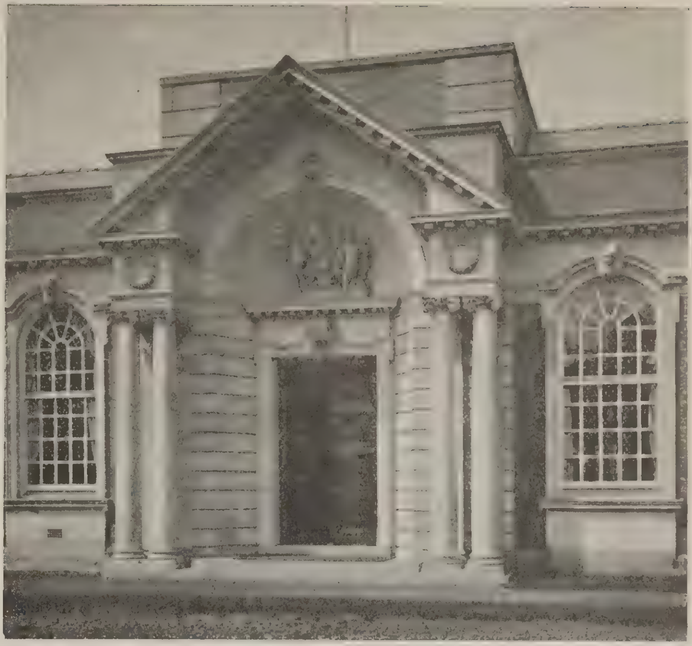


Nautical School, Portishead. E. Gabriel, F.R.I.B.A., Architect.

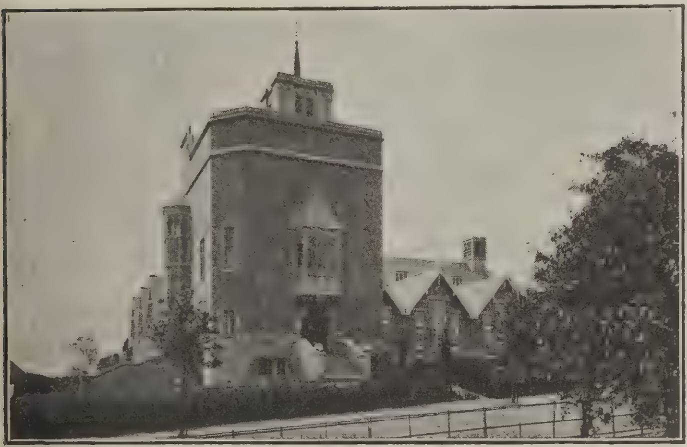
At Wavertree, one of the suburbs of Liverpool, the new Bluecoat School was formally inaugurated in June. The architects were Messrs. Briggs and Wolstenholme, F. B. Hobbs and Arnold Thornely. The school (which replaces the old Bluecoat Hospital in School Lane, Liverpool) provides accommodation for 250 boys and 150 girls. Behind the front block is a quadrangle in which is a central hall block, having a large dining-hall on the ground floor and the "Shirley Hall" on the floor above, the former being very effectively lined with green-stained whitewood and plaster, and the latter barrel-vaulted and panelled with whitewood left plain. At one side of the main front is the chapel and at the opposite side will be erected the swimming-bath and gymnasium, with a sanatorium beyond. The tower over the main entrance is not yet



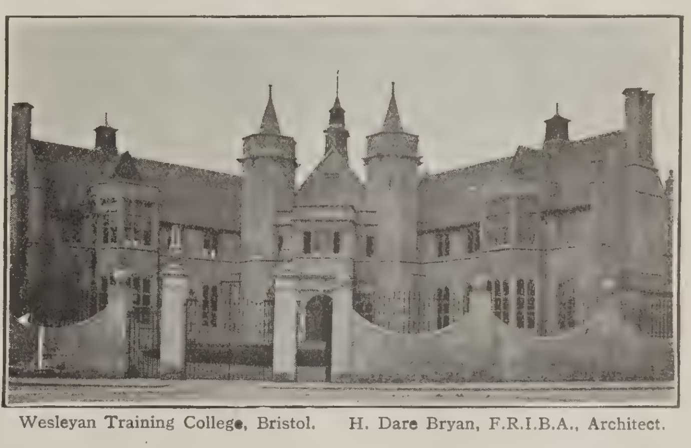
Board School, Scotland Street, Glasgow. Honeyman, Keppie and Mackintosh, Architects.



New Bluecoat School, Wavertree, Liverpool: Main Entrance. Briggs & Wolstenholme, F. H. Hobbs and Arnold Thornely, Architects.



New Schools, Bournville. W. Alex. Harvey, Architect.



Wesleyan Training College, Bristol. H. Dare Bryan, F.R.I.B.A., Architect.

built. The cost of the new school has been about £90,000.

In July the tender of Messrs. E. Turner & Sons for the erection of the South Wales University College in Cathays Park, Cardiff, was accepted — main building, £68,985; library, £18,862.

In July His Majesty the King opened the extensions made to the Armstrong College, Newcastle-on-Tyne. These comprise a principal front 300ft. long, with the Sir Lowthian Bell tower (120ft. high) and the examination hall, library, classrooms and laboratories. Mr. W. H. Knowles, F.S.A., of Newcastle, was the architect. The cost was more than £50,000.

On July 25th the foundation-stone of the new schools for University College at Frognal was laid. Mr. Arnold Mitchell is the architect. The total estimated cost is £110,000.

A new wing to the Durham University College of Medicine, Newcastle-on-Tyne, was opened in October. The cost of the addition was £11,000. Messrs. Dunn, Hansom and Fenwicke, of Newcastle, were the architects.

In January the new buildings of the Working Men's College at Camden Town were opened. A large assembly hall, gymnasium, library and various classrooms are provided. The total cost, including site, was about £30,000. Mr. W. D. Caröe was the architect.

A remarkable school in Scotland Street, Glasgow, was opened in the autumn. Messrs. Honeyman, Keppie and Mackintosh were the architects. The school is on the corridor plan, with 21 classrooms, 18 of which face south. An unusual appearance is given to the north front by the glazed bays lighting the staircases at either end. The cost of the school was about £15,000, accommodation being provided for 1,250 scholars.

Another new public school in Glasgow was erected in Cuthbertson Street, Coplawhill, at a cost of about £20,000, from designs by Mr. James Miller, A.R.S.A. It was opened on September 28th. Accommodation for 1,428 scholars is provided.

A new science building has been added to Trinity College, Dublin. Mr. Marshall was the architect.

The Girls' High School, Leeds, has been completed from designs by Messrs. Connon and Chorley.

The King Edward the Seventh School at Sheffield has been remodelled under the direction of Messrs. Gibbs and Flockton.

New buildings at University College, Reading, were completed at a cost of £50,000, from designs by Mr. W. Ravenscroft and C. S. Smith, F.R.I.B.A., of Reading.

At Dover work was commenced on the erection of the new Duke of York's School, which is to be transferred from Chelsea. The scheme has been prepared by Sir Henry Tanner, principal architect of His Majesty's Office of Works, and is likely to cost about £175,000.

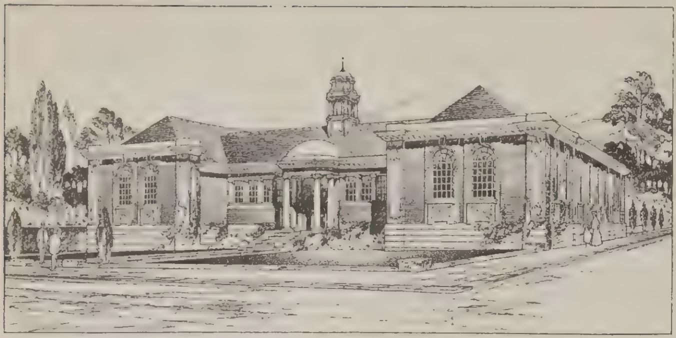
At Bournville, Birmingham, the public schools built by Mr. and Mrs. Cadbury were completed. Mr. W. Alexander Harvey was the architect. Accommodation is provided for 540 scholars. The cost was £30,000.

New buildings were erected at Queen Elizabeth's Grammar School for Boys at Mansfield, from designs by Mr. John Bilson, of Hull.

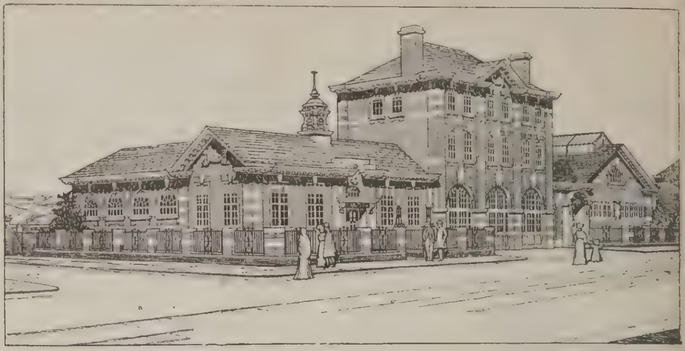
The new nautical school at Portishead (architect, Mr. Edward Gabriel, F.R.I.B.A., London) was opened in May by H.R.H. Princess Christian. The building has a frontage of 382ft.

At Chorley the new technical school was completed from designs by Messrs. Cheers and Smith, of Blackburn. The total cost was about £15,000.

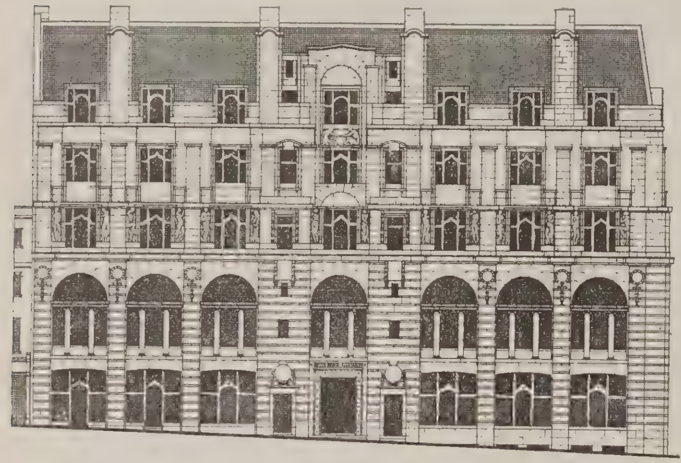
New council schools were erected at Watford, Altrincham, Barnsley, Gloucester, Farnham, Kingston-on-Thames, and other towns.



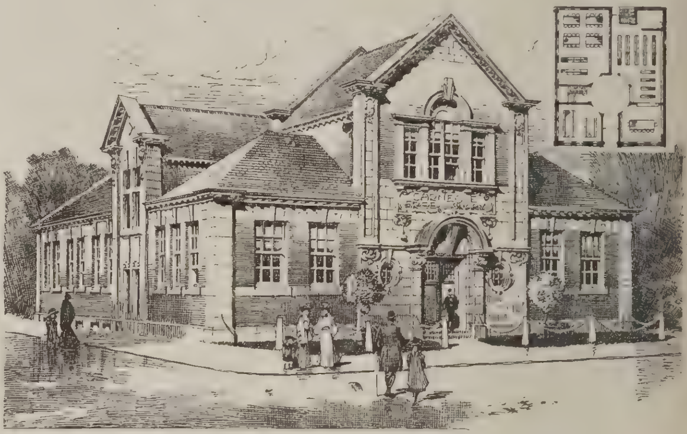
Free Library, Swadlincote. A. Macpherson, Architect.



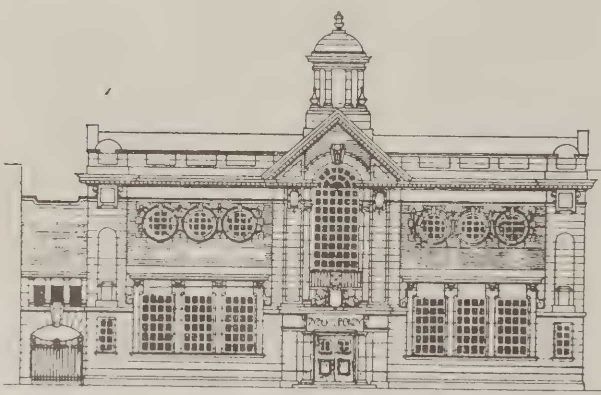
Fire Library and Fire Station, Reddish. Dixon and Potter, Architects.



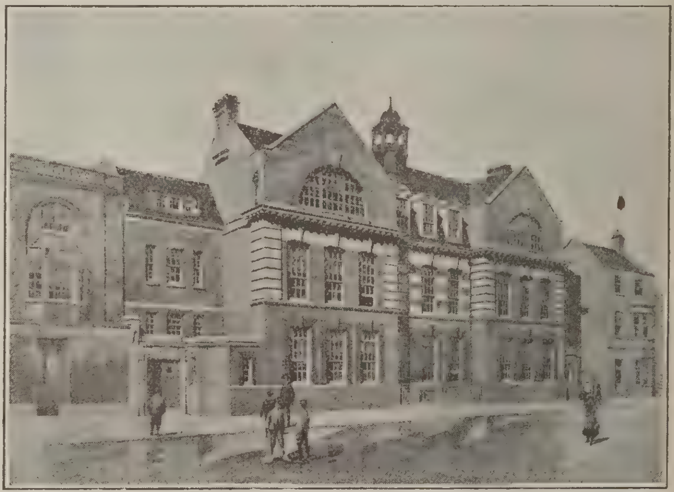
New Building for British Medical Association, Agar Street, Strand, London.
H. Percy Adams, F.R.I.B.A., Architect.



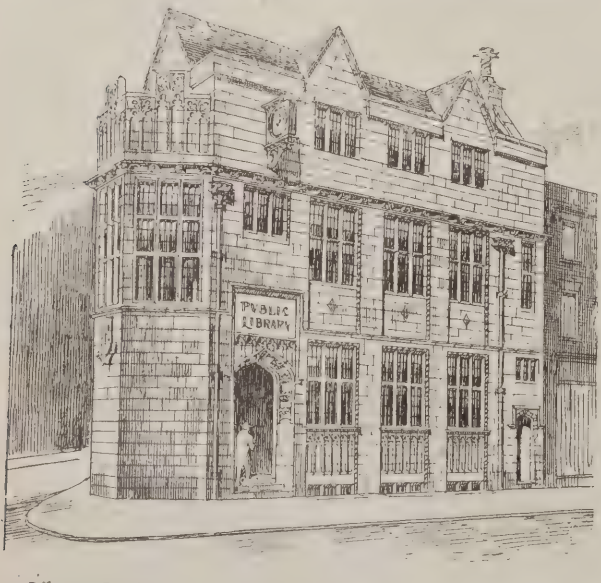
Free Library, Crompton. Jesse Horsfall, F.R.I.B.A., Architect.



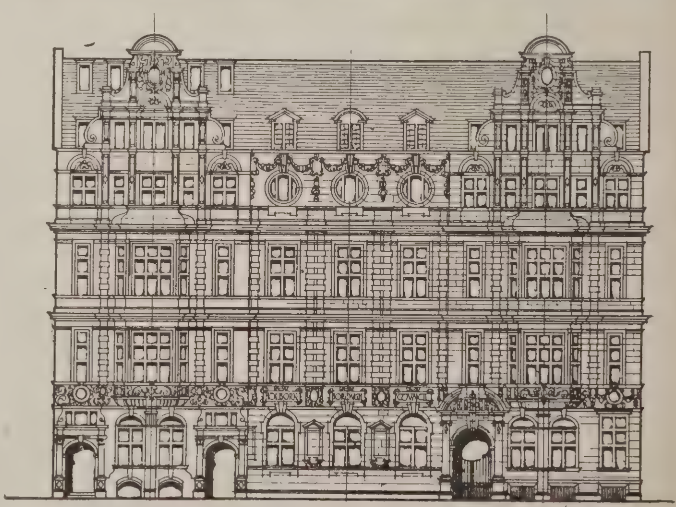
Free Library, Hove. Percy Robinson and W. Alban Jones, Joint Architects.



Secondary School and Technical Institute, Luton. Spalding and Spalding, Architects.

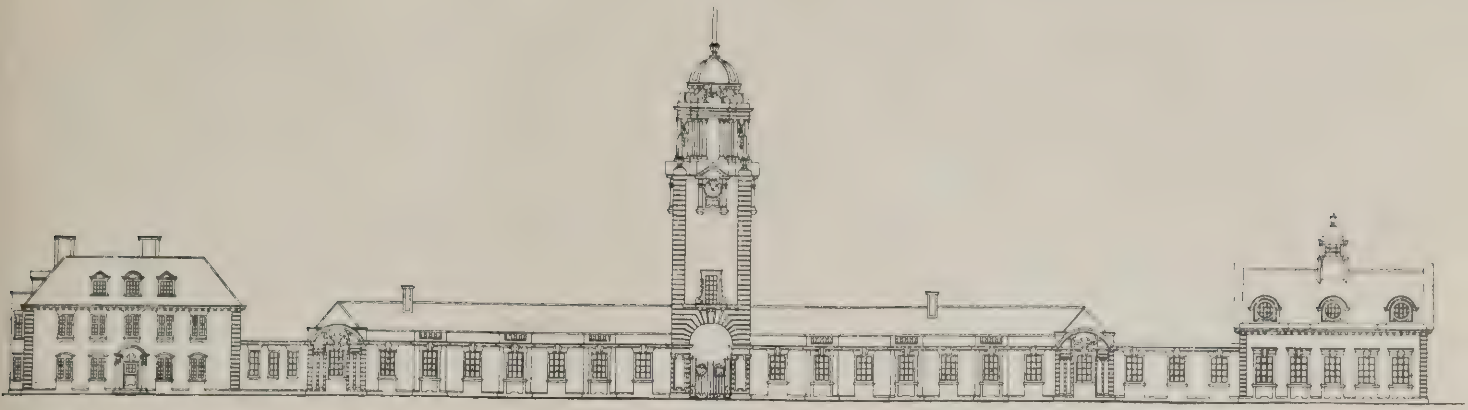


Free Library, Southwark, London. W. Claude Batley, A.R.I.B.A., Architect.

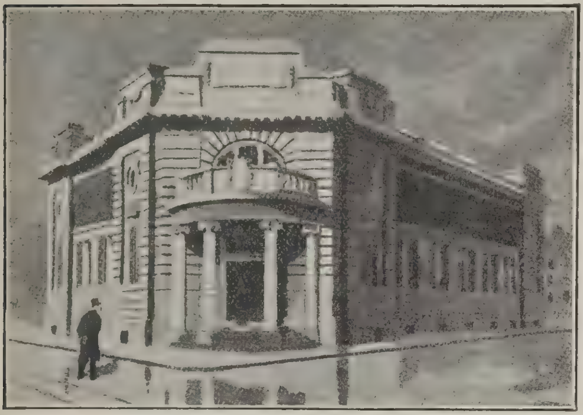


Holborn Municipal Offices. Warwick and Hall, Architects.

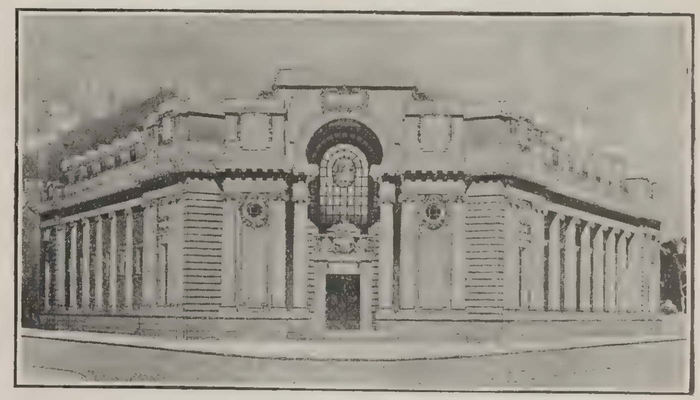
COMPETITIONS OF 1906: SOME FIRST-PREMIATED DESIGNS.



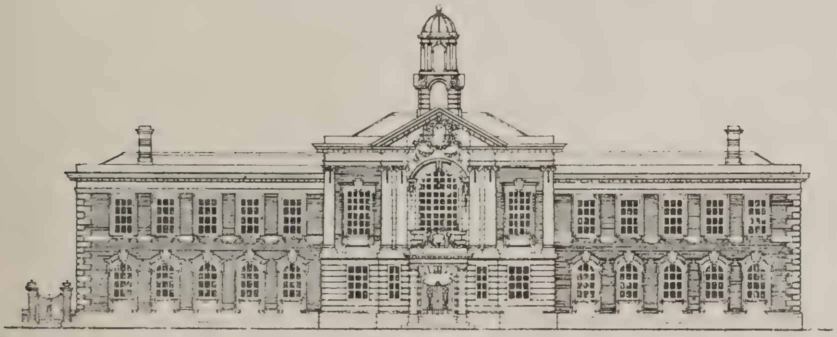
King Edward VII. Grammar School, Lytham, Lancs. Briggs & Wolstenholme and Arnold Thornely, Architects.



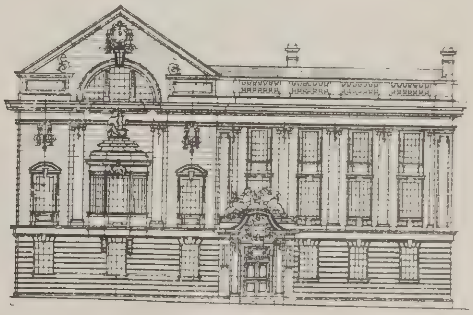
Central Library, Hackney, London. Henry A. Crouch, F.R.I.B.A., Architect.



Central Library, St. Pancras. Russell and Cooper, Architects,



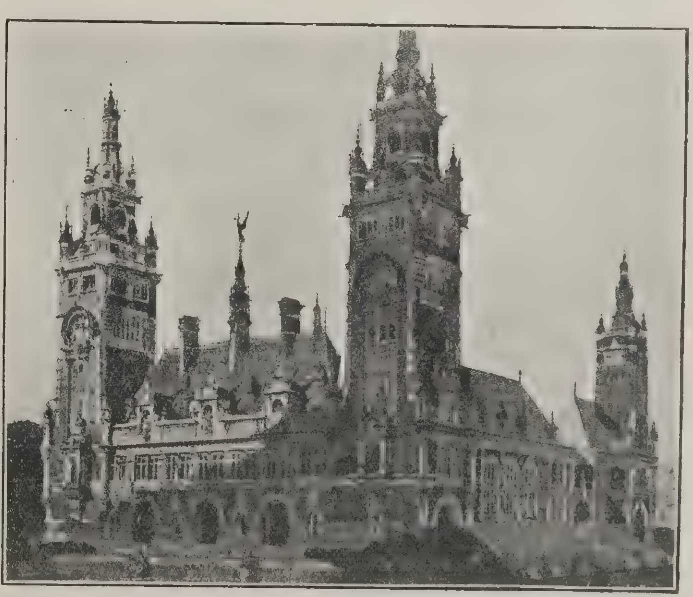
Wallsend Municipal Buildings. J. H. Morton, F.R.I.B.A., Architect



New Building for Institution of Engineers and Shipbuilders in Scotland, Elmbank Crescent, Glasgow. John B. Wilson, A.R.I.B.A., Architect.

MILAN EXHIBITION.

The Milan Exhibition was opened in May. The architecture was of a particularly exuberant order—rioting in fact—and could not be regarded as satisfactory by people of any restrained ideas. The Peace Pavilion was appreciably quieter than the majority, and was perhaps the most pleasing of all the pavilions, but the main entrance, with a representation of the Simplon Tunnel, also deserves mention as full of new life and vigour, with a "Rodinesque" feeling in the sculpture freely employed. Messrs. Waring & Gillow were awarded a grand prix and gold medal at this Exhibition for high-class furniture and decorative work; and Messrs. Doulton & Co., Ltd., a Diploma of Honour and Grand Prix for sanitary appliances.

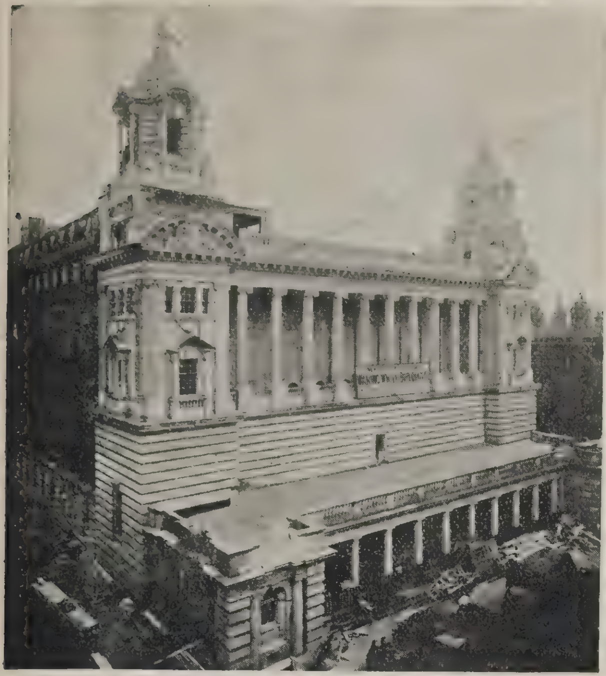


Peace Palace, The Hague. M. L.-M. Cordonnier, Architect.

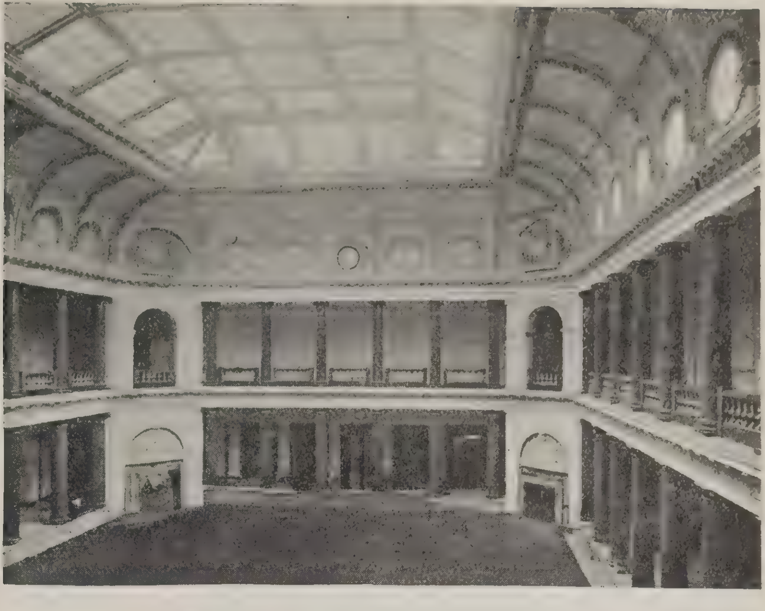
COMPETITIONS OF 1906: SOME FIRST-PREMIATED DESIGNS.

COMPETITIONS OF 1906.

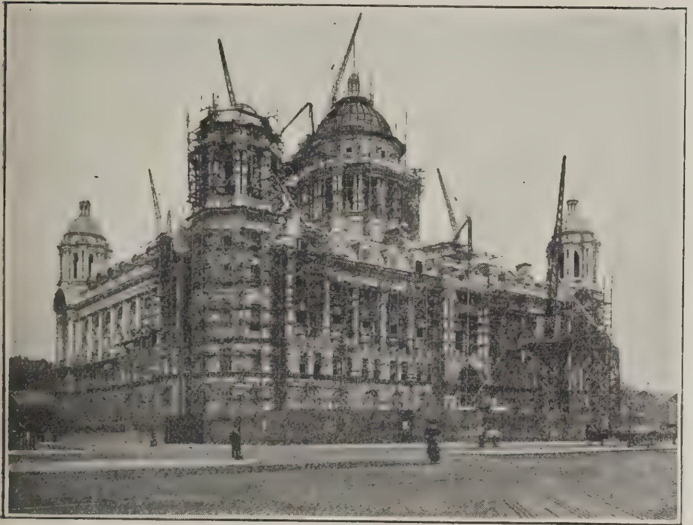
Award Announced	Building	Cost	Assessor	Successful Competitors	Remarks
		£			
January	King Edward VII. School, Fairhaven	50,000	Prof. Beresford Pite	1st (£250) Briggs & Wolstenholme and Arnold Thornely; 2nd (£100) Broderick, Lowther & Walker; 3rd (£50) Potts, Son & Hennings; 4th (£25) G. H. Willoughby	14 designs submitted
,,	Extension of Shire Hall, Norwich	8,850	A. J. Wood	1st (£100) E. J. Tench; 2nd (£50) W. Whiddington; 3rd (£25) W. J Durham	
,,	Library, Greenwich	4,500	A. W. S. Cross	1st (£25) Wills & Anderson; 2nd (£15) H. Goldsmith; 3rd (£10) H. A Crouch	172 designs submitted
,,	Law Courts, Cape Town	—	Mervyn Macartney	1st (£500) Hawke & McKinlay; 2nd (£300) Milne & Sladdin; 3rd (£200) Baker & Masey	
February	Isolation Hospital, Stockport	2,000	Dr. E. Seargeant	1st, G. H, Brady; 2nd, C. A. Locke; 3rd, A. G. Wilkinson	9 invited competitors
,,	Carnegie Library, Crompton	—	G. H. Willoughby	1st (£30) Jesse Horsfall; 2nd (£20) Dixon & Potter; 3rd (£15) T. J. Hill; 4th (£10) Eaton, Sons & Cantrell	46 designs submitted
,,	Secondary School and Technical Institute, Luton	7,000	H. Percy Adams	Spalding & Spalding	10 selected architects
March	Coroner's Court, Mortuary and Disinfecting Station, Deptford, S.E.	—	—	Horace T. Bonner	
,,	Carnegie Library, Pemberton	5,000	— Hartley	1st (£40) J. B. & W. Thornley; 2nd (£20) Heaton, Ralph & Heaton	
,,	Municipal Buildings, Wallsend	—	—	1st, J. H. Morton; 2nd, Shrewbrooks & Hodges; 3rd, Liddle & Brown	Limited competition
,,	Central Library, Hackney	10,000	J. W. Simpson	1st, H. A. Crouch; 2nd, Trimnell & Davison; 3rd, Crouch, Butler & Savage	152 designs submitted
,,	Schools, Salford	19,000	—	J. H. Woodhouse	
,,	Elementary Schools, Sutton Coldfield	6,000 1,500 1,200	J. H. Cossins	Crouch, Butler & Savage	Limited to local architects. Three separate schools
,,	Building of the Institution of Engineers and Shipbuilders in Scotland, Glasgow	15,500	—	1st, John B. Wilson; 2nd (£75) Mitchell & Whitelaw; 3rd (£50) H. E. Clifford; 4th (£25) W. F. McGibbon	43 designs submitted
April	Wesleyan Hall and Schools, Lytham	2,500	—	Herbert Wade and Walter Wade	
,,	Baptist Church School, Peterborough	—	—	Dotteridge & Walford	4 designs submitted
,,	Carnegie Library, Royston, Oldham	—	—	Butterworth & Duncan	Limited competition
,,	Council School, Farnworth	5,500	—	Ormrod & Pomeroy	
,,	Cartsburn School, Greenock	13,000	Andrew Balfour	1st, Salmon, Son & Gillespie; 2nd (40 guineas) Gall & Anderson; 3rd (30 guineas) Cowan & Knox	
,,	Free Library, Bangor	3,000	P. C. Thicknesse	1st (£25) A. E. Dixon; 2nd (£15) Vernon Hodge	117 designs submitted
,,	Schools, Princes Rock, Plymouth	15,910	H. Dare Bryan	1st (£50) Thornely & Rooke; 2nd (£30) A. S. Parker; 3rd, B. Priestley Shires	16 designs submitted
May	British Medical Association's New Premises, Strand	—	—	H. Percy Adams	6 selected competitors
,,	Palace of Peace, Hague	—	—	1st (£1,000) L. M. Cordonnier; 2nd (£750) A. Marcel; 3rd (£583) Franz Wendt; 4th (£416) Otto Wagner; (£250) H. Greenley and H. S. Olin; (£250) Franz Schwechten	217 competitors
,,	Municipal Offices, Coventry	30,000	—	(£50) T. F. Tickner	Limited to local architects
,,	Branch Libraries, Sunderland	—	—	1st, Hugh Hedley; 2nd, Clayton Green	
,,	Elementary School, Barnsley	—	W. S. Braithwaite	1st (£30) E. W. Dyson; 2nd (£20) A. Wilby; 3rd (£10) E. W. Dyson	
June	Public Library. Southwark	—	A. W. S. Cross	1st, Claude Batley; 2nd, S. W. Grant & Bowden; 3rd, Springhall & Taylor	99 designs submitted
,,	Coopers' Company's School, Bow	32,000	W. D. Caröe	1st (£150) T. Phillips Figgis and Alan E. Munby; 2nd (£150) George Elkington; 3rd (£50) H. O. Cresswell	
,,	Guildhall, Perth	2,250	James Miller	A. G. Heiton	
,,	Hospital. Leuchars, Edinburgh	—	—	W. Carruthers Laidlow	25 designs submitted
,,	Library, Hove (2nd competition)	9,333	John Belcher	1st (£50) Percy Robinson and W. Alban Jones; 2nd (£30) A. J. Hardwick and Sydney E. Castle; 3rd (£20) L. U. Grace	
July	Library, Swadlincote	—	Thomas Cooper	1st (£25) A. Macpherson; 2nd (£15) Walton & Thomas; 3rd (£10) F. B. Cooper	
,,	Cottage Hospital, Finchley	4,500	E. A. Woodrow, Dr. L. Barlow & W. H. Cross	1st, E. B. I'Anson; 2nd, Young & Hall	
,,	Borough Offices, Holborn	19,205	Establishment Committee of the Holborn Borough Council	1st, Warwick & Hall	5 designs submitted by invited architects
,,	Free Library, Caversham	1,600	—	1st (£20) W. G. Lenton; 2nd (£10) W. G. A. Hambling	
,,	Durham County Schools, Southmoor	10,425	—	1st & 2nd, Clark & Moscrop; 3rd, Liddle & Brown	41 designs submitted
,,	Carnegie Free Library, Annfield Plain	2,700	Committee	1st, E. Cratney; 2nd, T. E. Taylor; 3rd, Boyd & Groves	13 designs submitted
,,	Baths, Fire Station and Library, Reddish	5,054	Sir A. Brumwell Thomas	1st, A. E. Dixon & C. H. Potter; 2nd, J. Myrtle Smith; 3rd, Shewbrooks & Hodges	26 designs submitted
,,	Wesleyan Church, Ossett	—	—	Garside & Pennington	Limited competition
,,	Joint Isolation Hospital, Stone, Staffordshire	—	William A, Pite	J. J. Chapman	4 other competitors
,,	Central Library, St. Pancras	19,996	John Belcher	Russell & Cooper	Limited to 6 architects
,,	Wesleyan Church, Wallington, Surrey	6,640 without tower	—	1st, Frank Windsor; 2nd, (the late) W. D. Church; 3rd, H. A. Woodington	
September	Cottage Models and Designs, Birmingham	—	C. E. Bateman	Models: 1st (£15) H. T. Weaver; 2nd (£10) Hugo Bird and Robert Browne. Designs: 1st (£10) A. Dennis Thacker; 2nd (£7) S. Cooke and Norman Twist	
,,	Transvaal University College, Johannesburg	80,000	T. E. Collcutt	1st, R. Howden; 2nd, Dickson & McCowat; 3rd, Stucke & Bannister; 4th, Till & Till; 5th, McIntosh & Moffat: 6th, Leck & Emley	28 competitors
,,	Standard Colour Card	—	—	1st (£50) William E. Naylor; 2nd (£15) J. Standem Adkins; 3rd (£15) Edward F. Saunders	For Messrs. Pinchin, Johnson & Co., Ltd.
,,	Suburban House, Bristol	700 to 1,000	Corporation	1st (£15 15s.) Rowley & Norton; 2nd (£10 10s.) La Trobe & Weston; 3rd (£5 5s.) P. Hartland Thomas	
October	Free Library, Hither Green	4,500	—	Henry Hopton	Limited competition
,,	Cemetery and Caretaker's House, Stewarton	—	—	1st, J. & J. Armour; 2nd, J. Sturrock, junr.; 3rd, Cowan & Knox	
,,	Workmen's Houses, Tranent, Midlothian	2,046	—	Edward C. H. Maidman	
,,	Secondary School, Mexborough	—	—	1st J. E. Knight; 2nd, W. S. Braithwaite; 3rd, Smith & Enson	
,,	Sewerage Scheme, Emsworth	17,000	G. R. Strachan	1st, W. B. G. Bennett, Son & Berry; 2nd, H. Stringfellow	32 competitors
,,	Branch Dispensary, Smethwick, Birmingham	5,000	—	F. J. Gill	4 other Birmingham architects invited to submit designs
,,	New Headquarters, Bank of Africa, Capetown	—	Reginald Blomfield	1st, T A Sladdin; 2nd, Baker & Masey; 3rd, W. Black; 4th, Parker & Forsyth; 5th, Stucke & Bannister	
,,	New Schools, Consett	—	W. Rushworth	1st, H. Knowles; 2nd, J. Garry; 3rd, Clark & Moscrop	
November	Convalescent and Nurses' Home, Glossop	—	—	1st, Bulman & Vinycomb; 2nd, B. C. Deacon; 3rd, Woodhouse, Corbett & Dean	96 designs submitted
,,	Elementary School, Blackburn	—	—	Cheers & Smith (£30)	
December	Public Baths, Primrose Meadows, Sheffield	—	J. L. Fox	1st, A. Nunweek; 2nd, C. M. Hadfield & Son; 3rd, Potter & Sandford	17 designs submitted



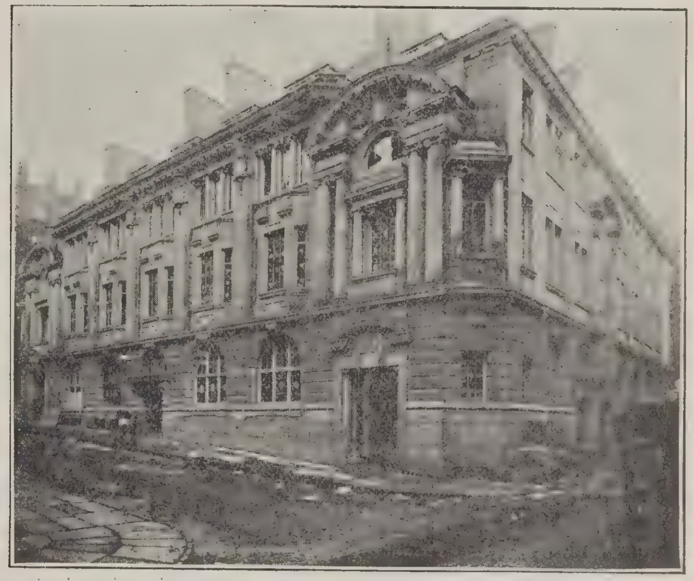
New Cotton Exchange, Old Hall Street, Liverpool.
Matear and Simon, FF.R.I.B.A., Architects.



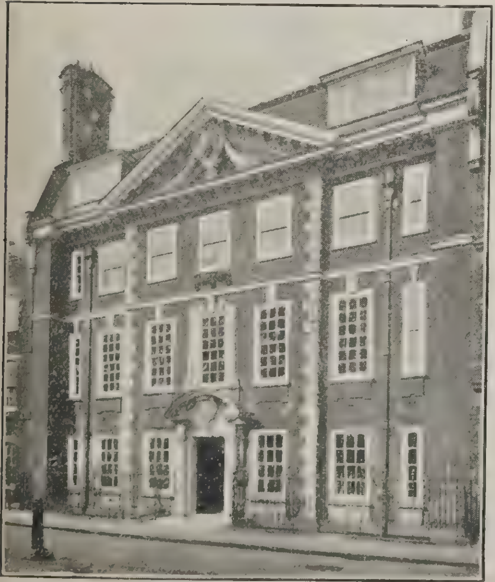
New Cotton Exchange, Liverpool: The Exchange Hall.



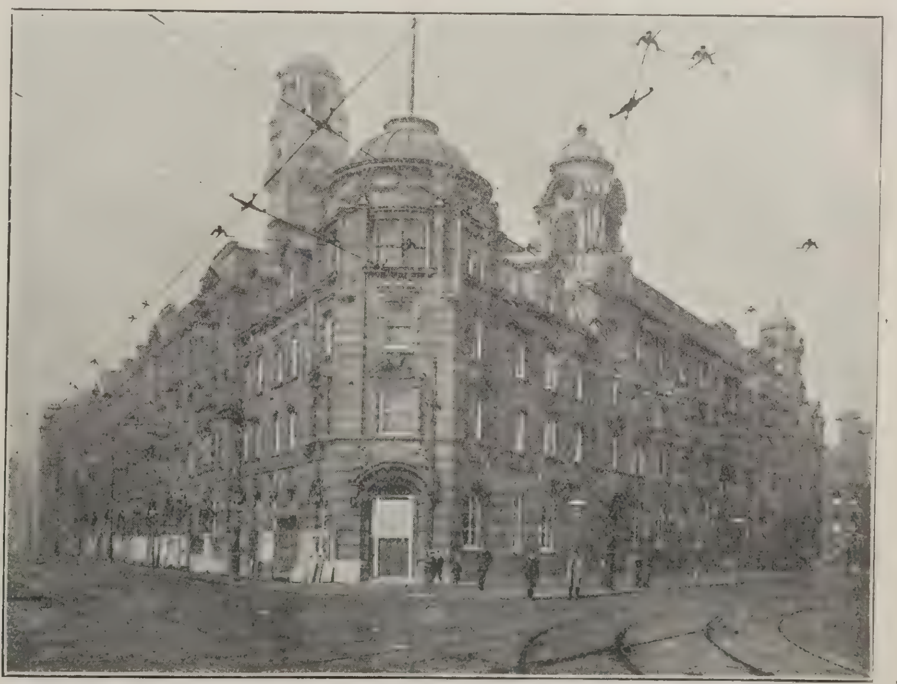
New Dock Offices, Liverpool.
Briggs and Wolstenholme, F. B. Hobbs and Arnold Thornely, Architects.



New Stock Exchange, Pall Mall, Manchester.
Bradshaw and Gass, FF.R.I.B.A., Architects.



N.E.R. Offices, Great College Street, Westminster.
Horace Field, F.R.I.B.A., Architect.



New Central Fire Station, London Road, Manchester. Woodhouse, Willoughby and Langham, Architects.

NEW EXCHANGES.

The new Cotton Exchange at Liverpool was opened by the Prince and Princess of Wales on November 30th. The building has its main front in Old Hall Street, where a great blank wall with a magnificent range of columns against it hides the glass roof to the exchange hall, the chief feature of the interior. This hall is 140ft. by 128ft., and on ground and first floors is embellished with a granite colonnade. The building has a steel frame, and the north front is faced with cast-iron, this having been adopted in order to reduce the obstruction to light by piers, &c., as much as possible, in order to secure an abundance of even lighting for the cotton sale-rooms on this front. The building was erected with great rapidity by the Waring-White Building Co., Ltd., who employed about 700 men on the job. The total cost exceeds £250,000. Messrs. Matear and Simon, of Liverpool, were the architects. Altogether about 3,000 tons of steel have been used in the building, and 17,500ft. super. of ornamental cast-iron, this latter having been supplied by Messrs. Walter Macfarlane & Co., of Glasgow.

At Manchester the new Stock Exchange, designed by Messrs. Bradshaw and Gass, of Bolton and London, was completed and opened in December. The building fronts Norfolk Street and Pall Mall, and is faced with Portland stone with a grey granite base.

In St. George's Place, Glasgow, the extension to the Stock Exchange was opened in April. It follows the lines of the main building and provides a new mining market, a telephone corridor more than 100ft. long, general offices, &c. Mr. J. J. Burnet was the architect.

LIBRARIES, BATHS, &c.

On June 20 the new Central Library at Bristol was opened. The main front is to Deanery Road. On the ground floor are news-room, magazine-room and lending library (for 25,000 books), while on the first floor are the reference library, 150ft. long and 40ft. high, with space for 100,000 volumes, and "the Bristol Room," containing the Bristol collection of books. Mr. H. Percy Adams, F.R.I.B.A., of London, was the architect, his design having been selected in competition.

At North Islington a branch library was opened on September 20th. It is the first of five to be built in the borough, and is on the "open access" system. The cost was £9,000, Mr. Henry T. Hare being the architect.

At Beverley a new public library was completed from designs by Mr. John Cash.

At Harrogate the new Free Library facing Victoria Avenue and Raglan Street was completed. The lending library provides shelving for 40,000 books. Mr. Henry T. Hare, F.R.I.B.A., of London, was the architect. The cost of the building was about £8,000.

At Glasgow three more district libraries were completed—at Dennistoun, Bridgeton, and Hutchesontown.

At Morningside, Edinburgh, a branch library has been erected from designs by the city architect, Mr. R. Morham.

At Battersea the first portion of the new baths, museum and library in Plough Road was opened in August. The total cost of the scheme is about £11,000.

New baths at Handsworth were erected at a cost of £22,000.

In High Street, Manchester, the Victoria Baths were opened in September by the Lord Mayor. The designs for the building were prepared by Mr. Henry Price, city engineer.

New tramway offices and depôt were erected at West Ham from designs by the Borough Engineer, Mr. John G. Morley, A.M.I.C.E., at a cost of about £40,000.

In Hatton Garden, Liverpool, the new tramway offices designed by the Corporation Architect and Surveyor, Mr. Thomas Shelmerdine, were completed, so far as the exterior is concerned, and advanced considerably inside.

New L.C.C. fire stations at Herne Hill, Brixton, and Greycoat Place, Westminster, were completed from designs by Mr. W. E. Riley.

The Central Forward Movement Hall at Newport was opened on October 4th.

At Manchester the new Central Fire Station was opened by the Lord Mayor on September 27th. The total cost, including site, has been about £145,000. The engine-house has space for seven vehicles, and stalls for 14 horses, the exits being into Fairfield Street. Residences are provided for the officers, and there are 35 tenements for firemen. Messrs. Woodhouse and Willoughby, of Manchester, were the architects.

In Dublin, at the corner of Great Brunswick Street and Tara Street, a new central fire-brigade station was erected from designs by Mr. C. J. M'Carthy, city architect.

A new public abattoir at South Shields was completed in Station Road, from designs by Mr. S. E. Burgess, borough engineer and surveyor. The main slaughter hall is 140ft. by 27ft. The total cost was about £17,500.

The new Central Police Office in St. Andrew's Square, Glasgow, was completed from designs by the City Engineer, Mr. A. B. M'Donald, at a cost of £40,000.

In Whitecross Street, London, E.C., the new Weights and Measures Office was opened by the Lord Mayor on September 19th. The building cost £6,000, and was erected from designs by the City Surveyor, Mr. Sydney Perks, F.R.I.B.A.

At Birmingham the great new power station in Sumner Lane was completed, after having been in course of erection for about two years. It has cost £200,000, and comprises engine-house, boiler-house, and economiser-house, each 275ft. long. There are two chimney stacks, the larger being 230ft. high and of 15ft. inside diameter. The architects were Messrs. Ewen Harper and Brother, of Birmingham, the building contract having been carried out by Messrs. William Sapcote & Sons, also of Birmingham.

At the end of May the new electricity generating station at Greenwich for the L.C.C. tramways was opened.

At Manchester a special committee appointed by the Corporation to report on the future use of the old Infirmary site in Piccadilly recommended the allocation of the ground for the erection of a new art gallery, museum and library.

BOOKS OF THE YEAR.

Cottages and Small Houses.

"Cottages and Week-End Houses," by J. H. Elder-Duncan, 5s. (*Cassell.*)

"Modern Suburban Houses," by C. H. B. Quennell, 16s. (*Batsford.*)

"The Modern Home," 5s. (*Hodder & Stoughton.*)

"Houses and Gardens," by M. H. Baillie Scott, 31s. 6d. (*Newnes.*)

"Bournville," by W. Alexander Harvey, 8s. 6d. (*Batsford.*)

"The American Country House," by Charles E. Hooper, 15s. nett. (*Batsford.*)

Architecture, Ornament, &c.

"Impressions of Japanese Architecture," by Ralph Adams Cram, 10s. 6d. (*John Lane.*)

"Reason in Architecture," by T. G. Jackson, 10s. 6d. (*John Murray.*)

"Architectural Sketching and Drawing in Perspective," by H. W. Roberts. (*Batsford.*)

"Reason as a Basis of Art," by C. F. A. Voysey, 1s. (*Elkin Matthews.*)

"A Glossary of English Architecture," by T. D. Atkinson, 3s. 6d. (*Methuen & Co.*)

"The American Vignola," by William R. Ware, Part II., 12s. 6d. (*Batsford.*)

"Alphabets Old and New," by Lewis F. Day, 2nd edition, 3s. 6d. (*Batsford.*)

"The Art of Garden Design in Italy," by H. Inigo Triggs, 73s. 6d. (*Longmans, Green.*)

"A Manual of Historic Ornament," by Richard Glazier, 6s. (*Batsford.*)

"The Cathedrals of England and Wales," by T. Francis Bumpus, 3 vols., 6s. each. (*T. Werner Laurie.*)

"The Cathedrals and Churches of the Rhine and North Germany," by T. Francis Bumpus. (*T. Werner Laurie.*)

Building Construction, Ventilation, &c.

"Building Construction," by Charles F. Mitchell, Elementary, 7th edition, 3s.; Advanced, 5th edition, 5s. 6d. (*Batsford.*)

"Modern Buildings: Their Planning, Construction and Equipment," by G. A. T. Middleton, 10s. 6d. each part; 4 parts. (*Caxton Publishing Co.*)

"Cassell's Building Construction," by Prof. Henry Adams. (*Cassell.*)

"Modern Practical Carpentry," by George Ellis, 12s. 6d. (*Batsford.*)

"The Building Mechanics' Ready Reference," by H. G. Richey. (*Chapman & Hall.*)

"Handbook for Superintendents of Construction, Architects, Builders, and Building Inspectors," by H. G. Richey. (*Chapman & Hall.*)

"Building Details," by Frank M. Snyder. 6s. 6d. (*Technical Journals, Ltd.*)

"Symmetrical Masonry Arches," by M. A. Howe. (*Chapman & Hall.*)

"Experiments on Hot Water Systems," by A. Sayers. (*Sanitary Publishing Co.*)

"The Ventilation, Lighting and Heating of Dwellings," by J. W. Thomas, 6s. (*Longmans, Green & Co.*)

"Sanitary Engineering," by Francis Wood, 2nd edition. (*Charles Griffin & Co.*)

Professional.

"The London Building Acts, 1894 to 1905," by Bernard Dicksee, 2nd edition. (*Stanford.*)

"Dilapidations," by Banister Fletcher, 6th edition, 6s. 6d. (*Batsford.*)

"Building Contracts, Building Leases, and Building Statutes," by Matthews & Ball, 4th edition. (*Butterworth & Co.*)

"London Building Acts (Amendment) Act, 1905," by Barnard C. Molloy, 5s. ("*Estates Gazette, Ltd*))

"Building Contracts," by Alfred A. Hudson. 3rd Edition, 2 vols., £2 12s. 6d. (*Sweet & Maxwell.*)

"Party Walls," by A. R. Rudall, 7s. 6d. (*Jordan & Sons.*)

"Dangerous Structures," by George H. Blagrove, 4s. 6d., 2nd edition. (*Batsford.*)

Special Treatises.

"Crematoria in Great Britain and Abroad," by Albert C. Freeman. (*St. Bride's Press.*)

"Modern School Buildings," by Felix Clay, 2nd edition, 25s. (*Batsford.*)

"Public Baths and Washhouses," by Alfred W. S. Cross, 21s. (*Batsford.*)

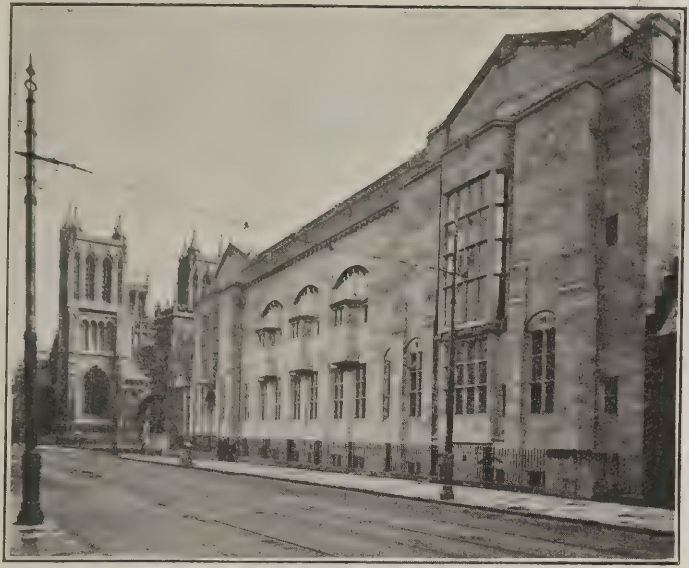
Concrete.

"Reinforced Concrete," by Marsh and Dunn. 3rd edition, 31s. 6d. (*Archibald Constable & Co.*)

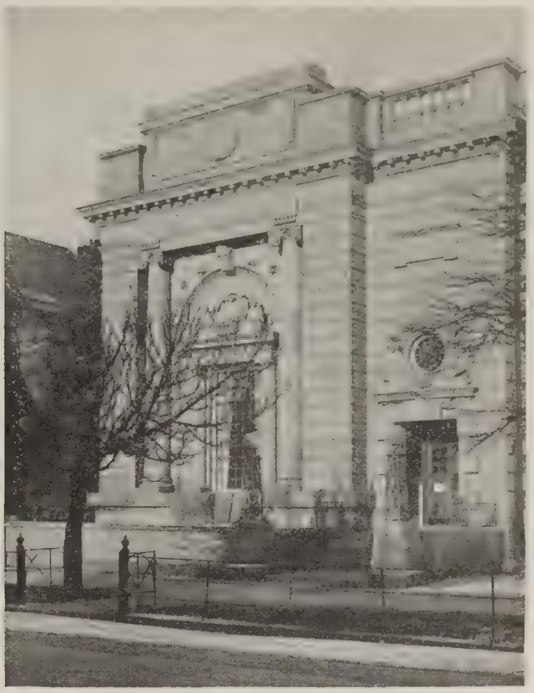
"Reinforced Concrete Construction," by Buel and Hill. 2nd edition, 21s. (*Archibald Constable & Co.*)

"A Handbook of Reinforced Concrete," by F. D. Warren, 10s. 6d. (*Crosby, Lockwood & Son.*)

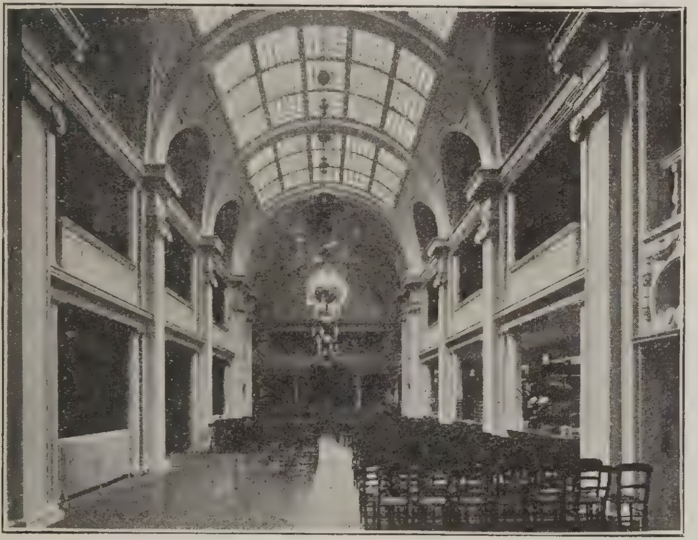
"The Manufacture of Concrete Blocks and their Use in Building Construction," by Rice Torrance. (*A. Constable & Co.*)



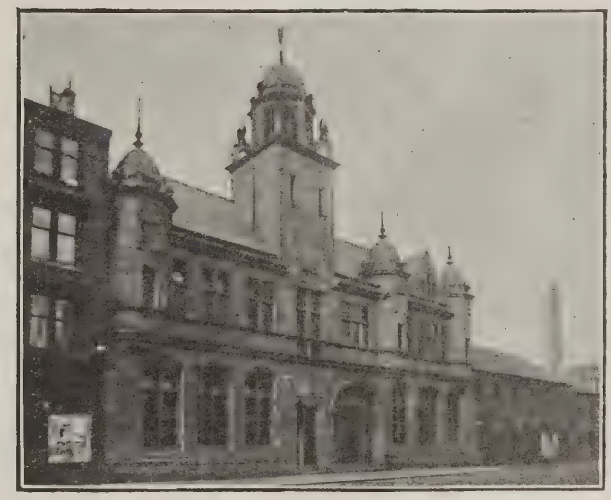
New Central Library, Deanery Road, Bristol.
H. Percy Adams, F.R.I.B.A., Architect.



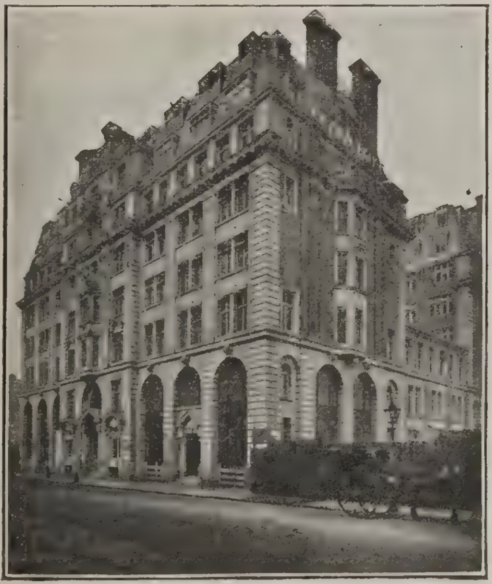
Library, Harrogate. Henry T. Hare, F.R.I.B.A., Architect.



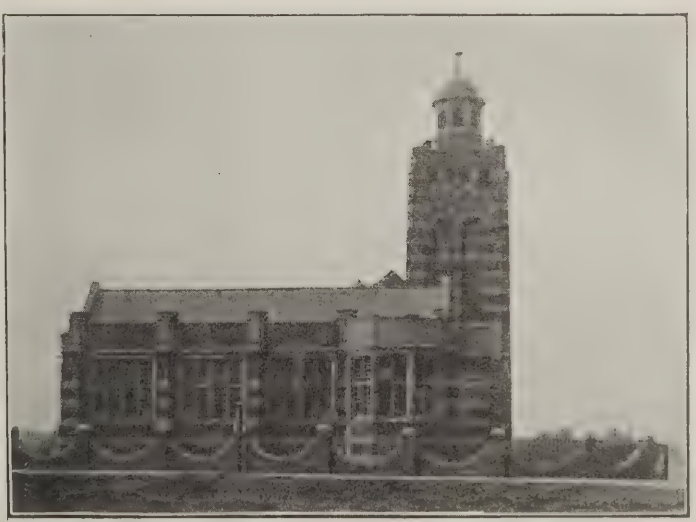
New Central Library, Bristol : the Reference Library.



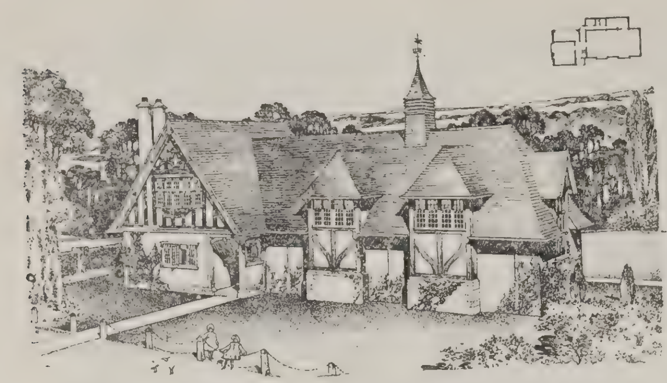
Hutchesontown District Library, Glasgow. James R. Rhind, Architect.



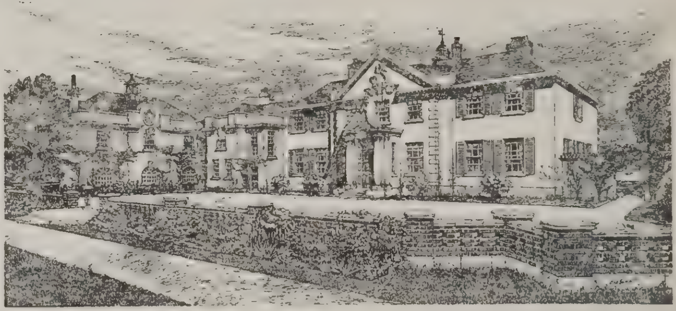
Caxton House, Tothill Street, Westminster.
J. S. Gibson, F.R.I.B.A., Architect.



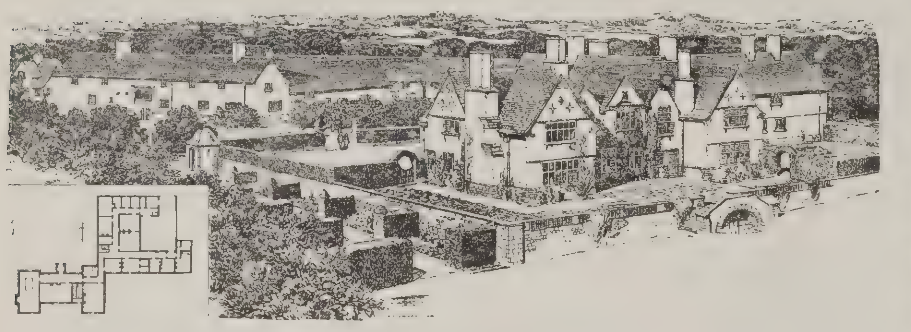
New Library, Tipton. George H. Wenyon, Architect.



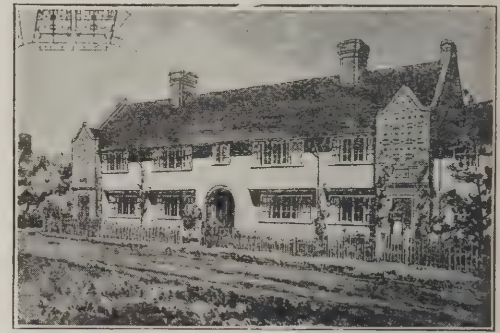
Village Club, Sandon, Staffs. E. Guy Dawber, F.R.I.B.A., Architect.



Shenley Hill, Herts. Frank T. Baggallay, F.R.I.B.A., Architect.



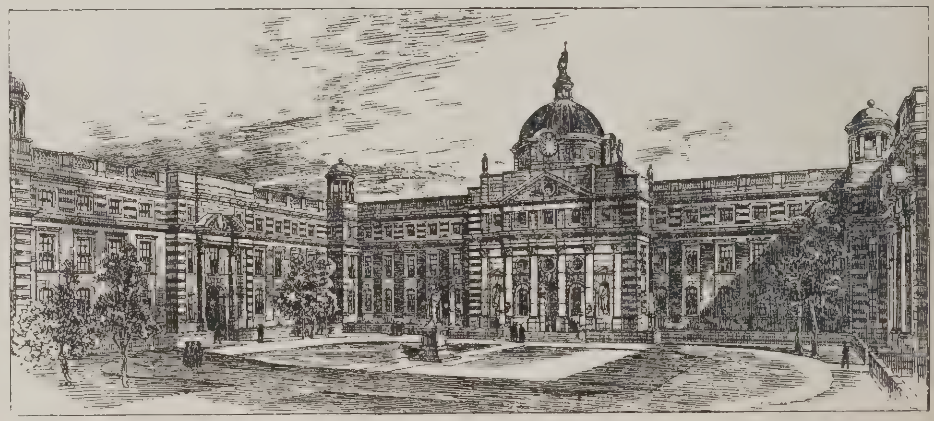
Burrough Court, Leics. Walter H. Brierley, F.R.I.B.A., F.S.A., Architect.



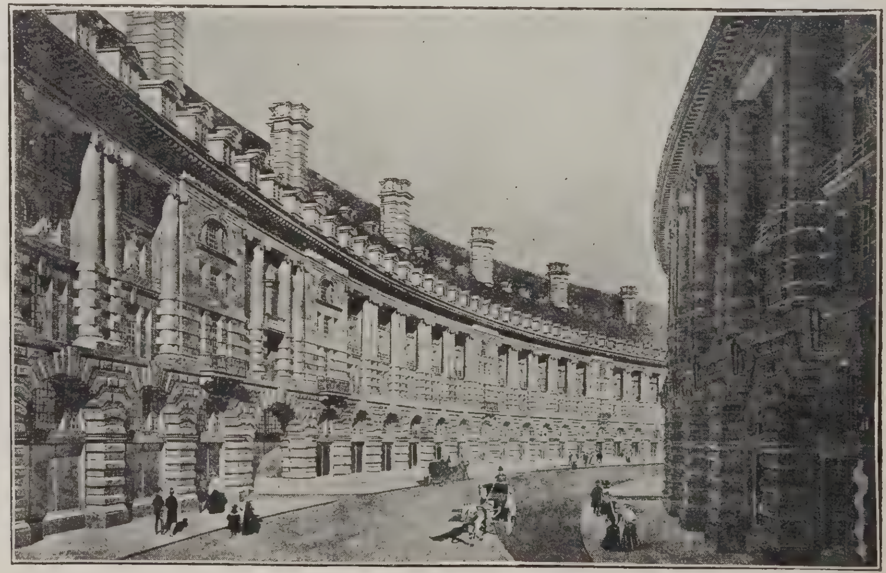
Cottages, South Mimms, Herts.
Geoffry Lucas, A.R.I.B.A., Architect,

THE ACADEMY.

In the Architectural Room at the Academy this year the most important and interesting scheme shown was Mr. Norman Shaw's rebuilding of Regent Street Quadrant. The new Piccadilly Hotel, which has a long front to the Quadrant, was the occasion of the scheme. Mr. Shaw tackled the work boldly and produced a fine design. After the exhibition of it at the Academy the scheme was assailed by the shopkeepers, who, clamorous for unlimited window-space, thought they saw a great injury being done to them by Mr. Shaw's projections between their shops. Mr. Shaw also exhibited at the Academy a much-wanted scheme for remodelling Piccadilly Circus, reducing its present chaos to a reasonable orderliness. Among the other exhibits at the Academy may be mentioned the Royal College of Science and Government offices at Dublin, of which Sir Aston Webb is joint architect with Mr. T. Manly Deane; a very interesting detail of the new Admiralty buildings to be erected at the east end of the Mall, also by Sir Aston Webb; a fragment of the new United University Club by Mr. Reginald Blomfield; Mr. Hare's fine design for the Provident Institution building now being completed opposite St. Clement Danes' Church in the Strand; the Royal Exchange buildings by Messrs. Ernest George and Yeates; a very clever design for a women's hospital in Soho Square, by Mr. Percy Adams; a detail of a block of city offices (Winchester House) by Mr. Belcher; the new town hall for Lancaster—a very dull building—by Mr. Mountford; Bournemouth Municipal Buildings, for which Mr. Mallows and Mr. Lacey are joint architects; a few good church designs—by Mr. Skipworth, Mr. Spooner, Messrs. Nicholson and Corlette, and Mr. Mileham especially; and a reputable collection of houses, large and small, up and down the country.



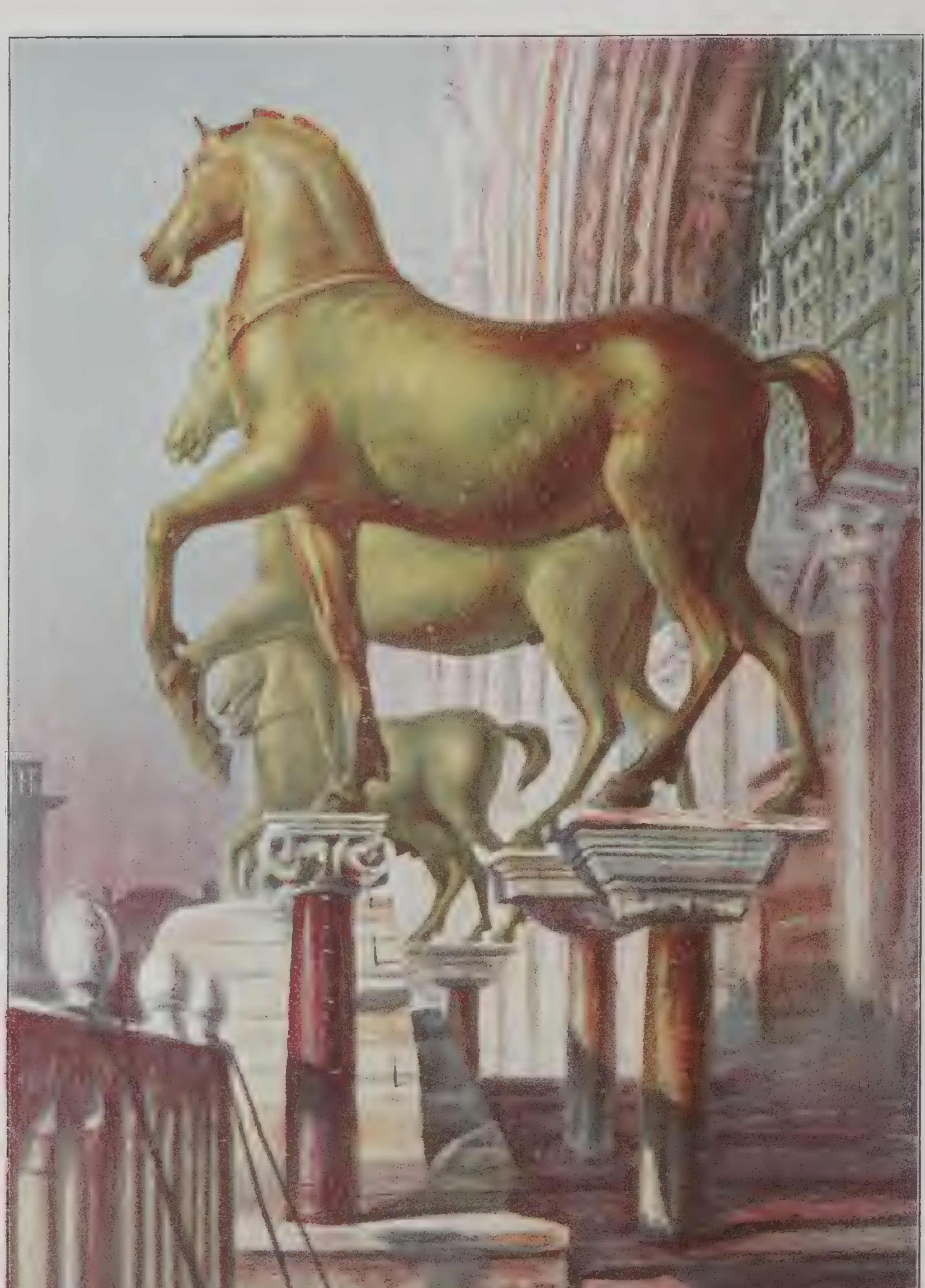
Royal College of Science and Government Buildings, Merrion Street, Dublin. Sir Aston Webb, R.A., and T. Manly Deane, A.R.H.A., Joint Architects.



Rebuilding of Regent Street Quadrant. R. Norman Shaw, R.A., Architect.

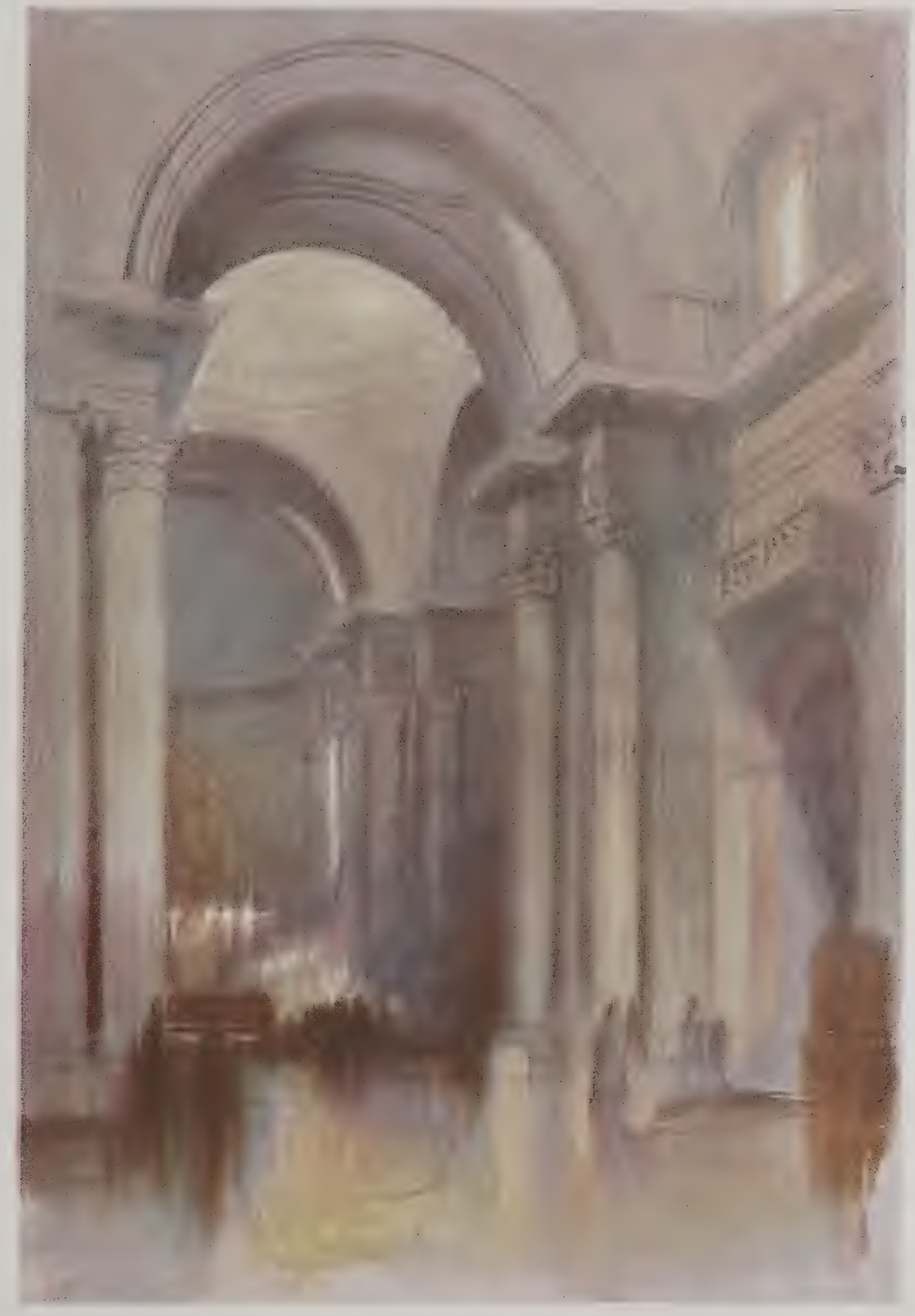
LIBRARY
OF THE
UNIVERSITY OF ILLINOIS

Supplement to
THE BUILDERS' JOURNAL AND ARCHITECTURAL ENGINEER,
Wednesday, December 26th, 1906.



THE BRONZE HORSES OF ST. MARK'S, VENICE.. DRAWN BY WALTER MILLARD.

Supplement to
THE BUILDERS' JOURNAL AND ARCHITECTURAL ENGINEER,
Wednesday, December 26th, 1906.



S. MARIA IN CAMPITELLI, ROME. DRAWN BY CHARLES GASCOYNE.

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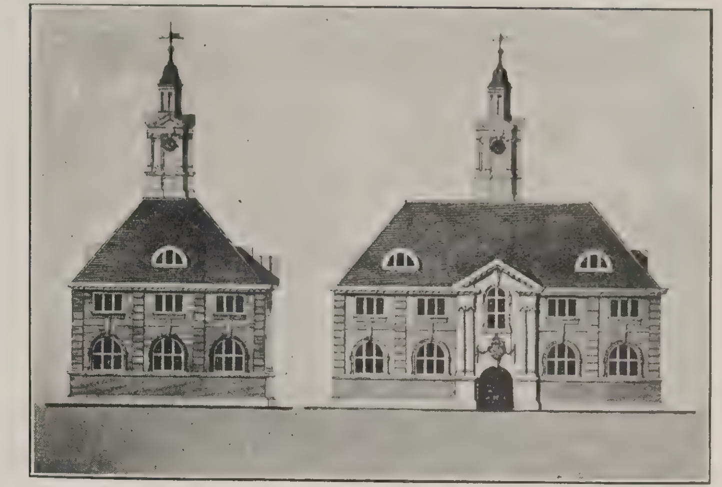
Lancaster Town Hall. E. W. Mountford, F.R.I.B.A., Architect.



District Council Offices, Camberley, Surrey. H. R. and B. A. Poulter, Architects.

How Green, Hever, Kent. R. Weir Schultz, Architect.

Royal Exchange Buildings, London. Ernest George and Yeates, Architects.

FROM THE ACADEMY.

ASSURANCE BUILDINGS, BANKS.

In St. James's Street, London, the new building for the Alliance Assurance Co. was completed. It is planned around a central court and is built entirely of Portland stone. Mr. R. Norman Shaw, R.A., and Mr. Ernest Newton were the joint architects.

A new building of the Prudential Assurance Co. in Dale Street, Liverpool, was erected from designs by Mr. Waterhouse.

In London Street, Norwich, new premises for the London & Provincial Bank were erected from designs by Messrs. G. J. and F. W. Skipper.

The Hearts of Oak Benefit Society's new premises in Euston Road, London, were opened by His Majesty the King on May 26th. The building cost £100,000. Messrs. Essex, Nicol and Goodman, of Birmingham, were the architects. There is a large general office on the ground floor, and on the first floor a delegates' hall seated for 210.

Work was commenced on the new offices for the London, Edinburgh and Glasgow Assurance Co. on the west side of Euston Square. Prof. Beresford Pite is the architect.

In St. Vincent Street, Glasgow, one wing of the large new building for the Scottish Provident Institution was completed and work on the remaining portion proceeded with. Mr. J. M. Dick-Peddie is the architect. In St. Enoch Square the erection of the new building for the National Bank of Scotland was proceeded with (architect, Mr. Alexander N. Paterson, M.A., A.R.I.B.A.).

A new bank in Market Square, Dover, was erected from designs by Mr. F. W. Waller, of Gloucester. For the illustration on p. 335 we are indebted to the "Dover Express."

BUSINESS PREMISES, WAREHOUSES.

In June the opening of the splendid new building of Messrs. Waring & Gillow, in Oxford Street, attracted great attention. The problem which the architect (Mr. R. Frank Atkinson, F.R.I.B.A.) had to solve was to provide an enormous floor area, to provide as great a superficies of window as was compatable with dignity, and to challenge attention. This problem, it will be generally admitted, he has solved very successfully. The building is faced with red bricks, relieved with stone, which, around the heads of the circular windows, and in other parts, is very richly carved. Within the building is a spacious entrance hall leading into a rotunda 54ft. in diameter and 85ft. high, off which on the several floors are ranges of rooms. The linen shop, carried out in waxed mahogany, is unique, while other fine apartments are the antique salon (decorated in Georgian style), the restaurant —essential modern in treatment, and the ladies' room adjoining. The floors throughout the building were constructed by the Columbian Fireproofing Co., Ltd., of London.

New premises for Messrs. Novello & Co., music publishers, were completed in Wardour Street, from designs by Mr. F. L. Pearson, F.R.I.B.A. The building includes a hall 44ft. by 36ft. by 24ft. high, which takes the place of the old shop.

A new warehouse for Messrs. William McGeoch & Co., Ltd., was erected in West Campbell Street and Cadogan Street, Glasgow, and a very high reinforced concrete office block in Hope Street from designs by Messrs. Salmon and Son and Gillespie.

A new packing warehouse and offices in Whitworth Street, Manchester, was carried on towards completion, from designs by Mr. H. S. Fairhurst, A.R.I.B.A., of Manchester. The building is expected to be finished next February.

At Aylesbury new printing works for Messrs. Hazell, Watson & Viney were erected with great rapidity, from designs by Mr. W. Ernest Hazell, A.R.I.B.A., of London.

THEATRES.

A new theatre at Cardiff, by Messrs. Ernest Kuntz & Ford, was opened by Mr. Beerbohm Tree in December.

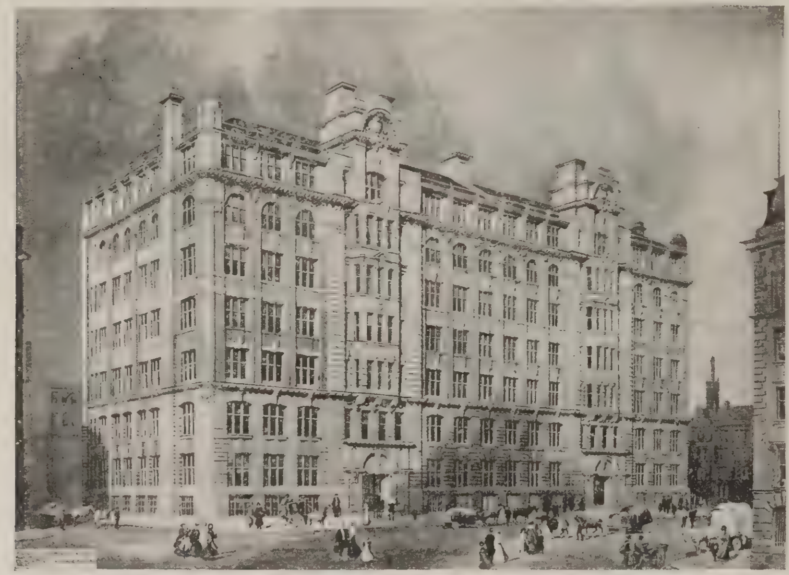
At Aberdeen a new theatre was completed from designs by Messrs. Frank Matcham & Co. It will seat 2,500 persons. The cost of the building was £35,000.

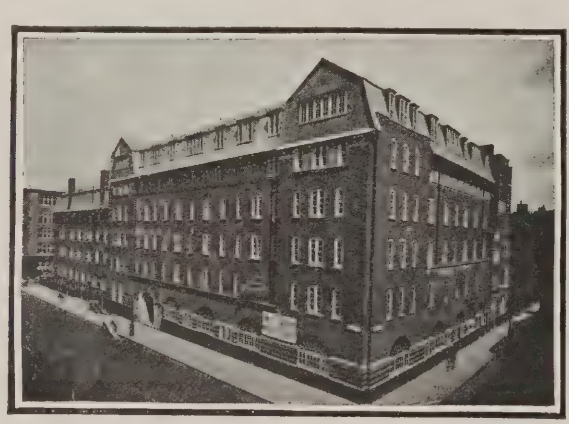
The old "Royal" music-hall on Holborn was converted into the "Holborn Empire" at a cost of £30,000, from designs by Messrs. Frank Matcham & Co.

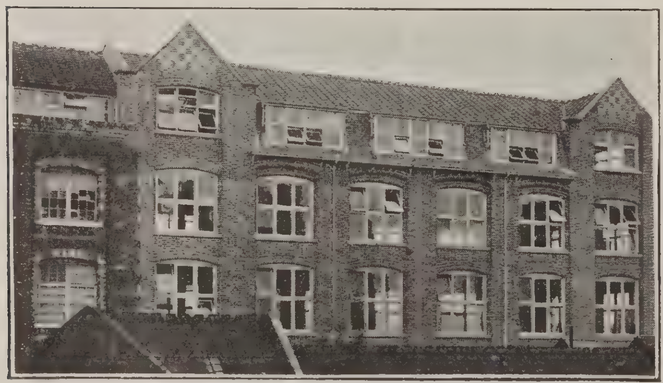
At Putney the Hippodrome was completed, from designs by Mr. F. W. Kingston.

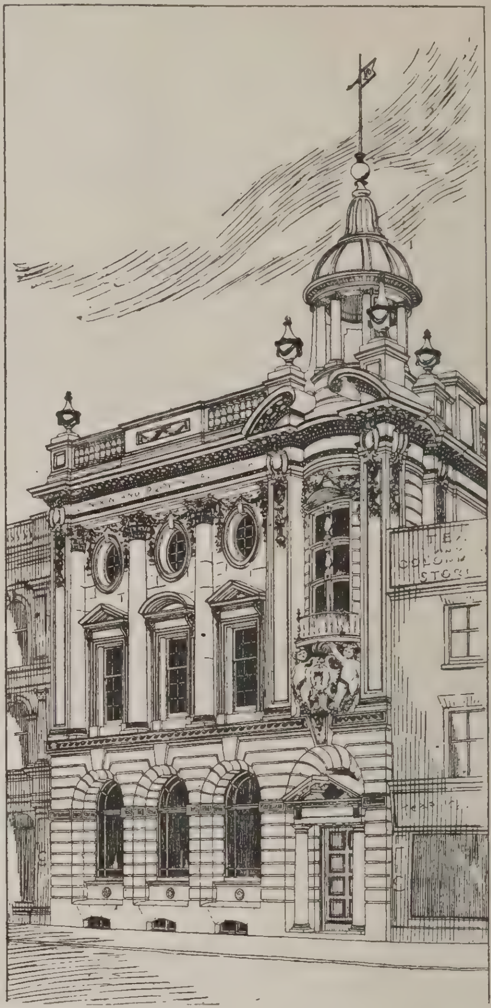
In Shaftesbury Avenue the new Hicks Theatre was erected.

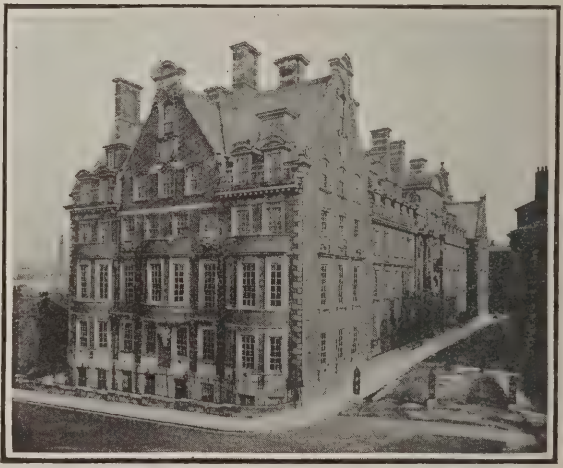
At Edinburgh the new King's Theatre in Leven Street was opened in December. Messrs. James Davidson, F.R.I.B.A., and J. D. Swanson were the joint architects. The cost of the building was about £50,000.


Packing Warehouse and Offices, Whitworth St., Manchester. Harry S. Fairhurst, A.R.I.B.A., Architect.


Bruce House, Drury Lane, London. W. E. Riley, F.R.I.B.A., Superintending Architect L.C.C.


Printing Works, Aylesbury. W. Ernest Hazell, A.R.I.B.A., Architect.


London and Provincial Bank, London Street, Norwich. G. J. and F. W. Skipper, Architects.


N.E.R. Offices, York. Horace Field, F.R.I.B.A., and William Bell, F.R.I.B.A., Joint Architects.

OFFICE BUILDINGS.

At Liverpool great advance was made with the huge new building for the Mersey Docks and Harbour Board, and the exterior is now practically finished, while the interior is in the hands of painters, decorators, and others engaged on finishing work. The façades are of Portland stone, and the central dome is 74ft. in diameter at the base, the top of its cupola being 223ft. above pavement level. The front and rear frontages of the building are each 264ft. in length, and the side frontages not much short of that. The total cost of the building, including fittings, will be about £300,000. Messrs. Briggs and Wolstenholme, F. B. Hobbs and Arnold Thornely are the architects, and Messrs. William Brown and Sons, of Manchester, are the contractors.

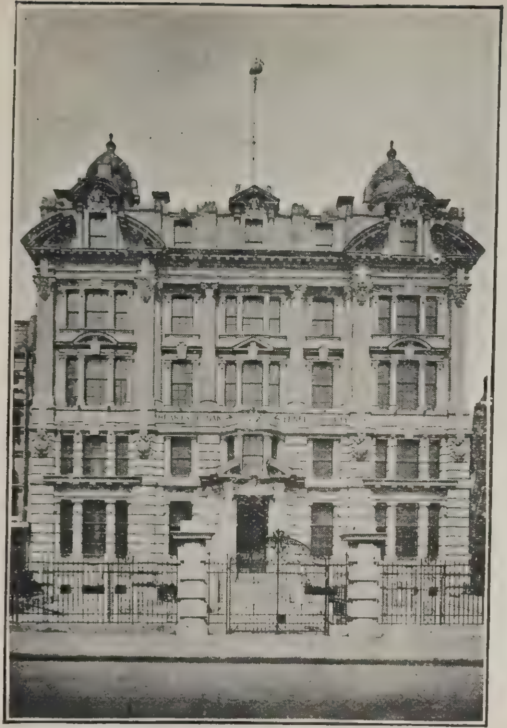
On September 24th the Ecclesiastical Commissioners moved into their new building at the corner of Millbank Street and Great College Street, Westminster. Mr. W. D. Caröe was the architect.

At the corner of Aldwych and the Strand, London, the new "Morning Post" building was commenced early in the year. Messrs. Mewès and Davis are the architects, and The Waring-White Building Co., Ltd., the contractors; the granite work being by Messrs. A. & F. Manuelle, Ltd., of London.

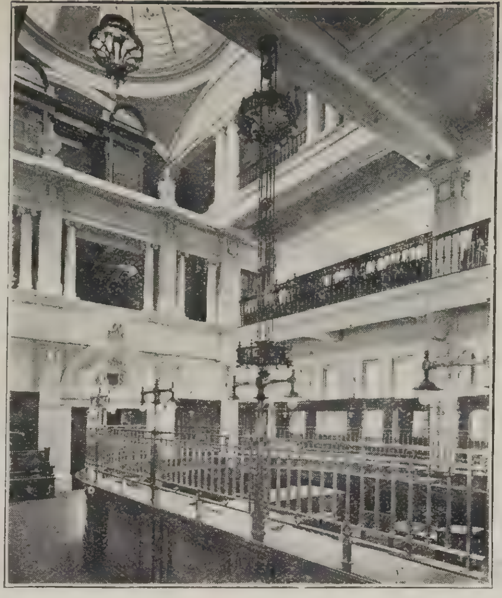
At York an imposing block of offices for the North-Eastern Railway Co. was completed, after having been in course of erection for five years. Nearly 200 rooms are provided, the largest being the boardroom on the first floor. Mr. Horace Field, F.R.I.B.A., of London, and Mr. William Bell, F.R.I.B.A., of York (chief architect to the company), were responsible for the design.

Caxton House, Westminster—a large block of office premises in Tothill Street, adjacent to the Aquarium site for the new Wesleyan Hall—was completed from designs by Mr. J. S. Gibson, F.R.I.B.A. Rather a novel feature is the use of wood casements for all windows.

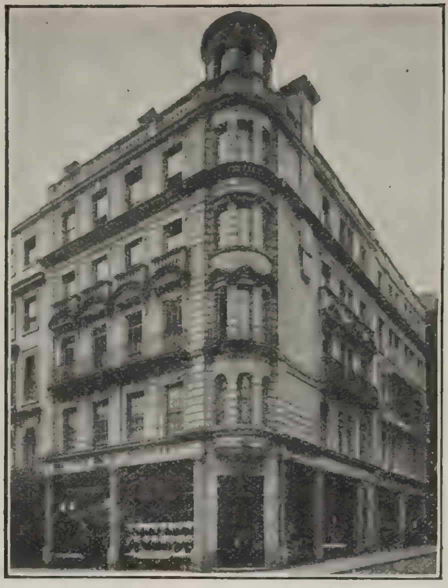
In South Parade, Leeds, the office block for the Phœnix Insurance Co. was completed from designs by Mr. W. H. Thorp.



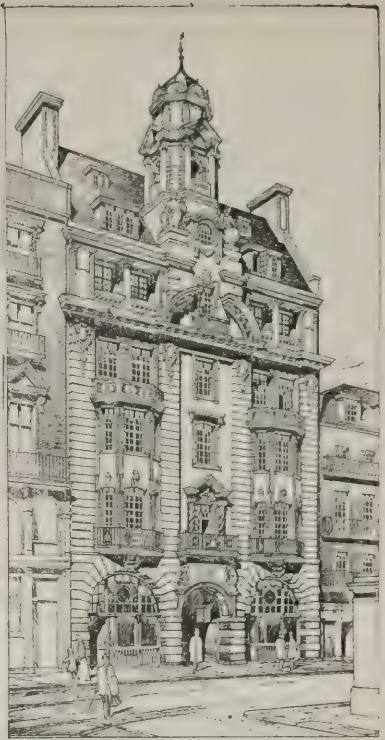
Hearts of Oak Offices, Euston Road, London.
Essex, Nicol and Goodman, Architects.



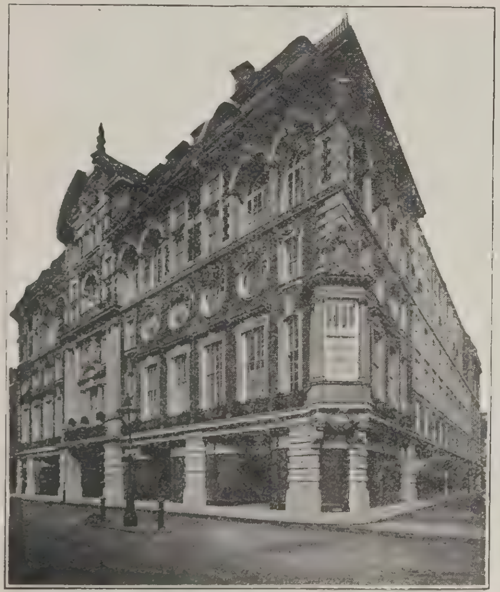
Hearts of Oak Offices, Euston Road, London.



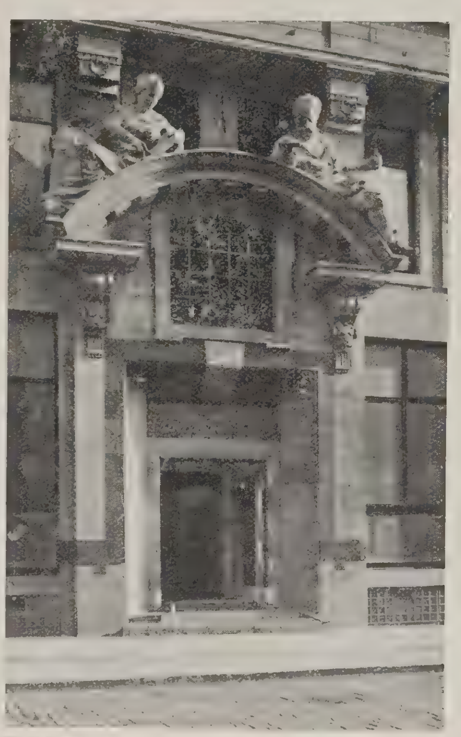
Business Premises and Flats, Jermyn Street, London, S.W.
W. Woodward, F.R.I.B.A., Architect.



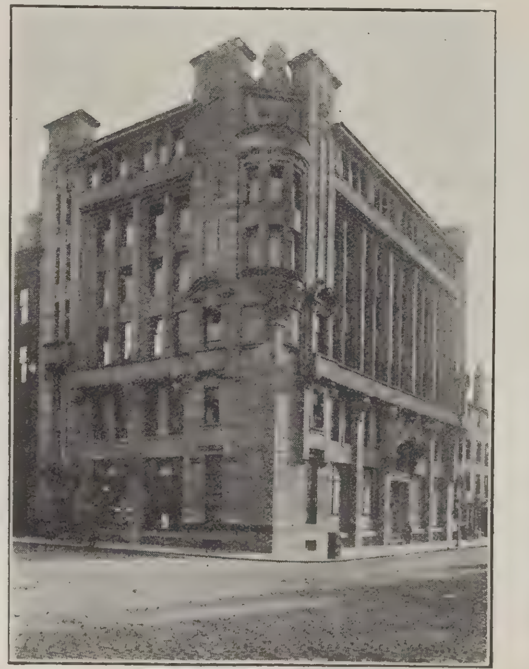
New Premises for London and Lancashire
Fire Insurance Co., Pall Mall, London.
E. Guy Dawber, F.R.I.B.A., Architect.



The Waring Building, Oxford Street, London.
R. Frank Atkinson, F.R.I.B.A., Architect.

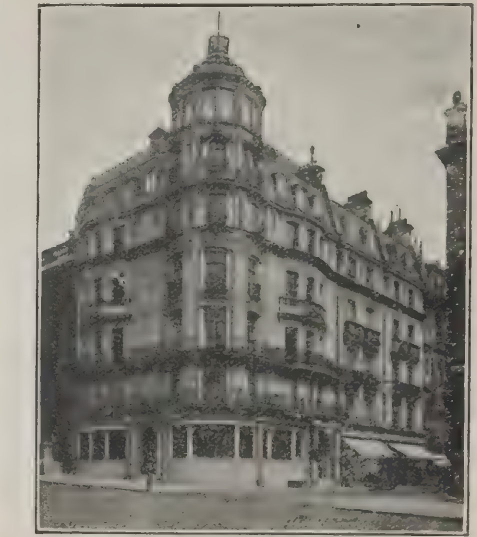


Entrance Doorway to McGeoch's Warehouse, Glasgow.

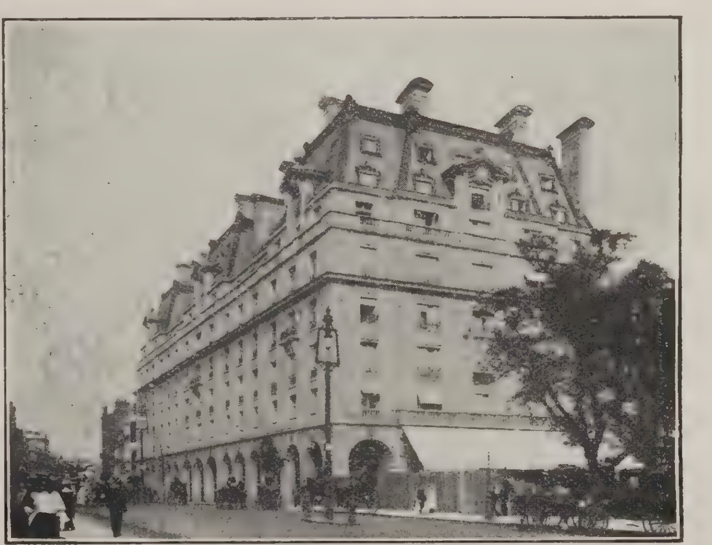


McGeoch's Warehouse, West Campbell Street, Glasgow.

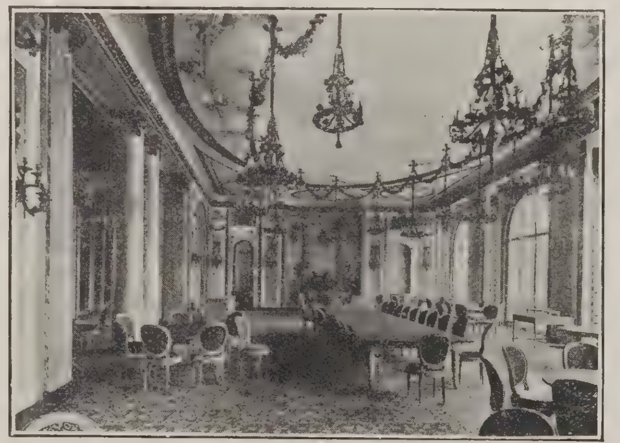
J. J. Burnet, A.R.S.A., Architect.



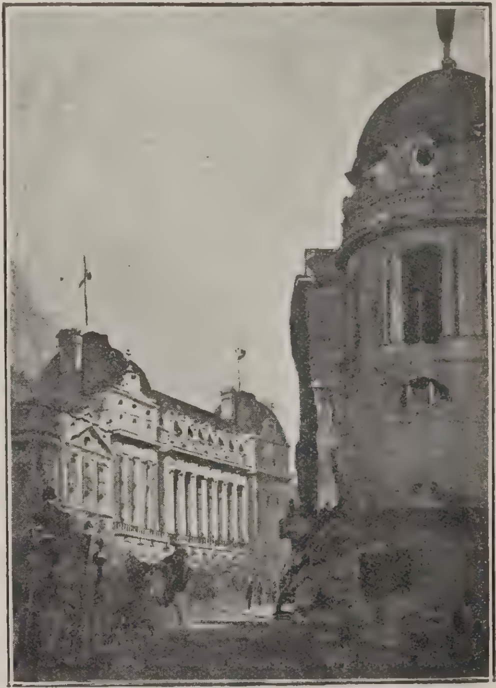
Bank and Flats, St. James's Street, London, S.W.
W. Woodward, F.R.I.B.A., Architect.



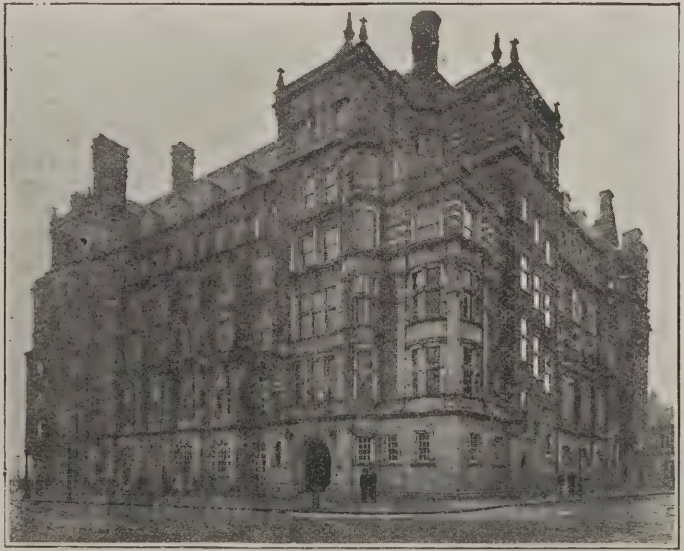
Ritz Hotel, Piccadilly London.
Mewès and Davis, and John P. Bishop, A.R.I.B.A., Architects.



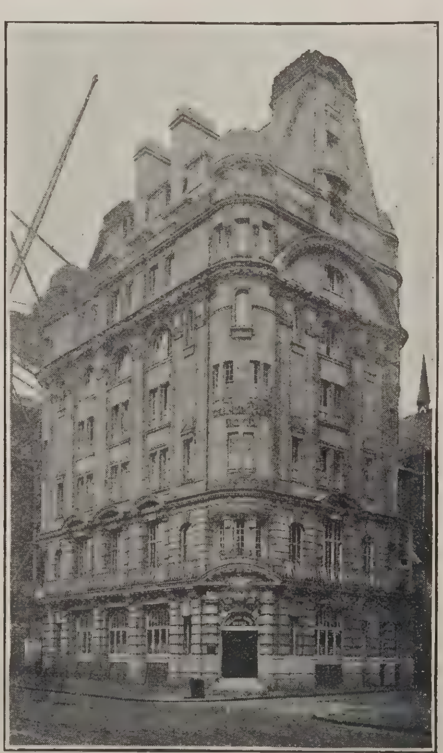
Ritz Hotel: The Restaurant.



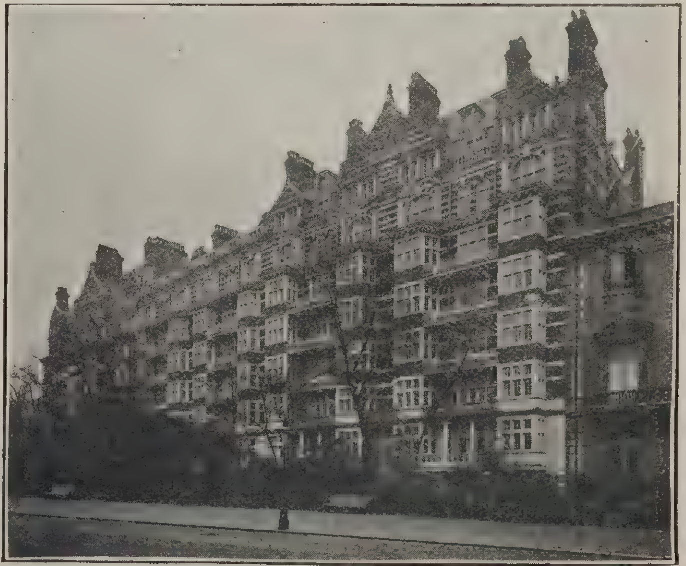
Waldorf Hotel, Aldwych, London.
A. Marshall Mackenzie, A.R.S.A., and Son, Architects.



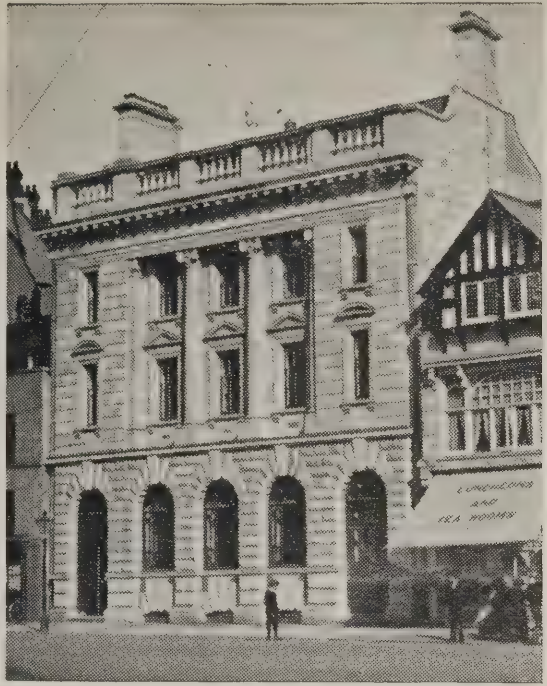
Ecclesiastical Commissioners' Offices, Millbank Street, Westminster.
W. D. Caröe, M.A., F.S.A., Architect.



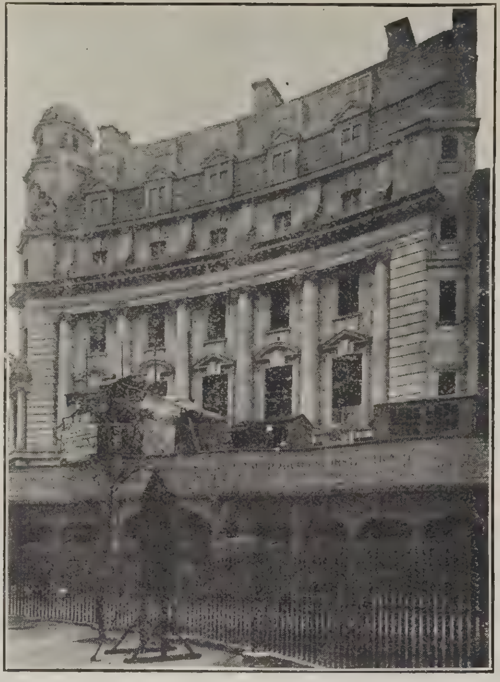
Tollard Hotel, Southampton Row, London.
Bradshaw and Gass, FF.R.I.B.A., Architects.



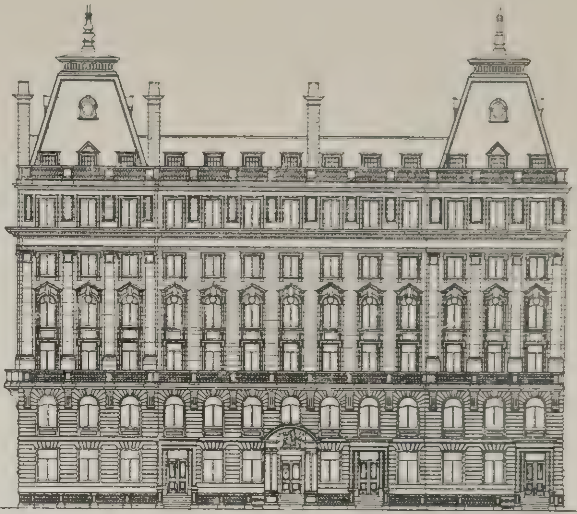
Flats, Knightsbridge, London. Hart and Waterhouse, Architects.



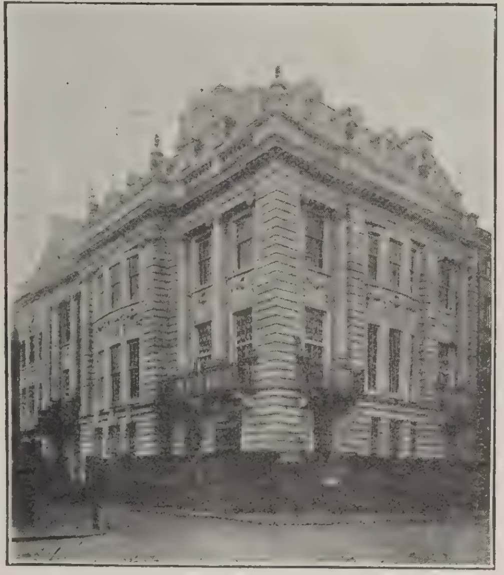
Lloyds Bank, Market Square, Dover.
F. W. Waller, F.R.I.B.A., Architect.



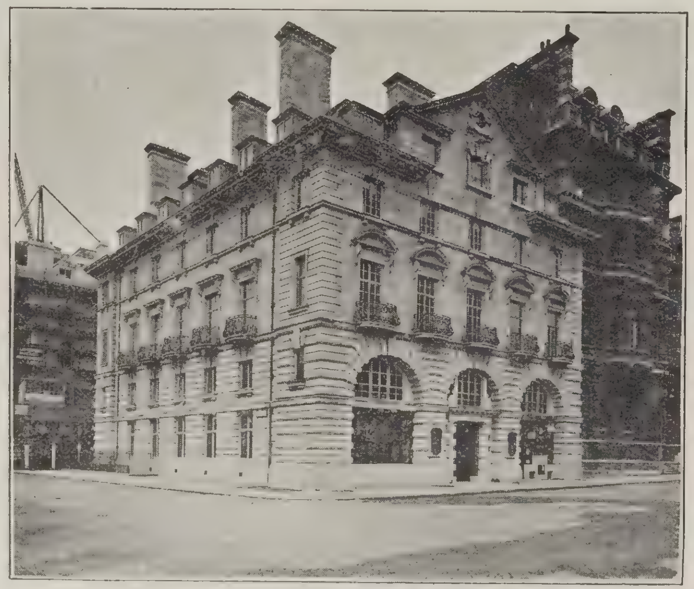
United Kingdom Temperance and General Provident Institution Building,
Strand, London. Henry T. Hare, F.R.I.B.A., Architect,



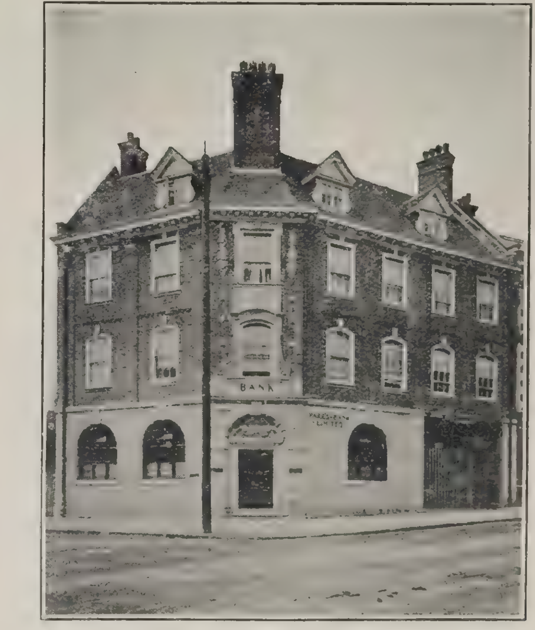
Scottish Provident Institution Building, St. Vincent Street, Glasgow.
J. M. Dick-Peddie, Architect.



United University Club, Suffolk Street, London, S.W.
Reginald Blomfield, A.R.A., Architect,



Alliance Assurance Building, St. James's Street, London.
R. Norman Shaw, R.A., and Ernest Newton, Joint Architects.



Parr's Bank, Woodford.
E. Guy Dawber, F.R.I.B.A., Architect.

HOTELS.

The Ritz Hotel, in Piccadilly, London, was opened in June. This building is notable not only as a piece of architecture, but also for the fact that it was the first complete example in this country of American methods of steel-frame construction. The work reflects great credit on all concerned—on Messrs. Mewès & Davis, the architects; on the Waring-White Building Co., Ltd., the contractors; and on Messrs. Waring and Gillow, the decorators and furnishers. The hotel is faced with Norwegian granite, and has a colonnade on the Piccadilly front. Within the building the chief apartments are the restaurant, looking on to the Green Park, the winter garden, and the banqueting hall and ballroom in the basement. More than 150 bedrooms and salons are provided, and about 75 bathrooms, the rooms being arranged in suites and carried out in the most luxurious style.

After lying idle for a long time, work on the new Waldorf Hotel, in Aldwych, London, was recommenced in earnest early in the summer, and at the present time the steel frame of this large building is well advanced, and the granite facing on Aldwych up to second-floor level. Messrs. A. Marshall Mackenzie & Son are the architects, and Messrs. The Waring-White Building Co., Ltd., are the contractors.

At the bottom of Southampton Row, London, the Tollard Hotel was erected from designs by Messrs. Bradshaw and Gass. We believe this is the first hotel in London to have hot and cold water laid on to lavatory basins in the bedrooms; another feature is that there are no urinals, the "Only" silent non-ball valve closet being fitted throughout.

In Russell Square, London, the Imperial Hotel was erected from designs by Mr. Fitzroy Doll, F.R.I.B.A. The floors throughout and the roofs are by the Kleine Patent Fire-resisting Flooring Syndicate, Ltd.

The Ivanhoe Hotel, at the corner of Bloomsbury Street and Great Russell Street, London, was completed in the early part of the year. The hotel includes 20 suites of rooms and 250 bedrooms. Mr. T. Duncan Rhind, A.R.I.B.A., of Edinburgh, was the architect.

At the Caledonian Station Hotel, Glasgow, a large extension was completed. This comprises a new dining-room 100ft. by 50ft. by 30ft. high, lounge, billiard-room, &c., together with about 130 bed-rooms and sitting-rooms. Mr. James Miller was the architect.

MISCELLANEOUS.

There has been considerable outcry against the mutilation of the trees on the Embankment by reason of the new tramways being laid so close to the pavement. The trees have been "pruned" to allow for the 16ft. clear headway required by double-decked cars. At present the effect of the "pruning" is not particularly noticeable, but when the trees are in leaf again it will be seen how much they have been mutilated.

The demolition of Sir Edward Watkins's ill-fated copy of the Eiffel Tower at Wembley Park, London, N., was commenced in August by a firm of Manchester contractors. The tower was to exceed the Eiffel Tower in height and splendour, but, as a matter of fact, never reached more than 150ft. out of the projected 1,200ft.

At Cleveleys, on the Lancashire coast, near Blackpool, an exhibition of cottages was held during the summer on the lines of that held at Letchworth last year. The first prize of £100 for a detached cottage costing £290 was won by Mr. Albert E. Done, of Blackpool, and the first prize of £100 for a pair of cottages costing £430 by Mr. Q. Mangnall Bluhm, of St. Anne's-on-Sea.

In June the Engineering Standards Committee issued a British standard specification for structural steel for bridges and general building construction.

At the Royal Exchange, London, a fresco of "Modern Commerce," by Mr. Frank Brangwyn, was unveiled in October. It forms a companion fresco to "Ancient Commerce," by the late Lord Leighton.

Transporter Bridge across the Usk, at Newport, Mon.

At the beginning of the year a circular-letter in reference to rural by-laws was sent by the Local Government Board to the rural district councils throughout the country.

BRIDGES, &c.

The new bridge across the Thames at Vauxhall, after having been under construction for 7½ years, was opened on May 26th. It replaces a structure opened in 1816 and finally dismantled in 1899. The abutments and piers are of concrete faced with granite, the superstructure being of steel. There are five spans, the centre span being 150ft. wide. About 4,000 tons of steel were put into the bridge. Much difficulty was experienced with the foundations. The bridge was designed by Mr. Maurice Fitzmaurice and Mr. W. E. Riley, F.R.I.B.A., respectively engineer and architect to the London County Council. Messrs. Pethick Brothers, of Plymouth, were the contractors for the substructure, and Messrs. Charles Wall, Ltd., for the superstructure. The total cost was £437,000.

The new high-level bridge across the Tyne, connecting Gateshead and Newcastle, was opened in July by H.M. the King. There are four spans—two of 300ft., one 232ft. and one 191ft., the total length of the bridge being 1,150ft. The contract ranks as the largest of its kind in this country since the completion of the Forth Bridge. The structure was designed by Mr. C. A. Harrison, chief engineer of the N.E.R., northern division.

The new transporter bridge across the Usk at Newport, Mon., was formally opened on September 12th.

The new lock at Molesey was opened at the beginning of June. With the exception of Teddington, it is the largest lock on the Thames, being 267ft. long and 30ft. wide. The total cost of the work was £14,000.

New sea-defence works and a grand pavilion at Bridlington were completed at a cost of £40,000. The engineering work was under the direction of Mr. E. R. Matthews, A.M.I.C.E., borough engineer, while the architects for the grand pavilion were Messrs. Mangnall & Littlewoods, of Manchester. The reinforcement for the concrete-work is expanded steel.

On December 17th the Bridge House Estates Committee of the City Corporation accepted the tender of Sir William Arrol & Co., for £203,000, for the widening of Blackfriars Bridge, which is to be commenced early next year and will occupy about two years.

A reinforced concrete bridge of 96ft. span at Stanford, Worcestershire, was constructed on the Hennebique system.

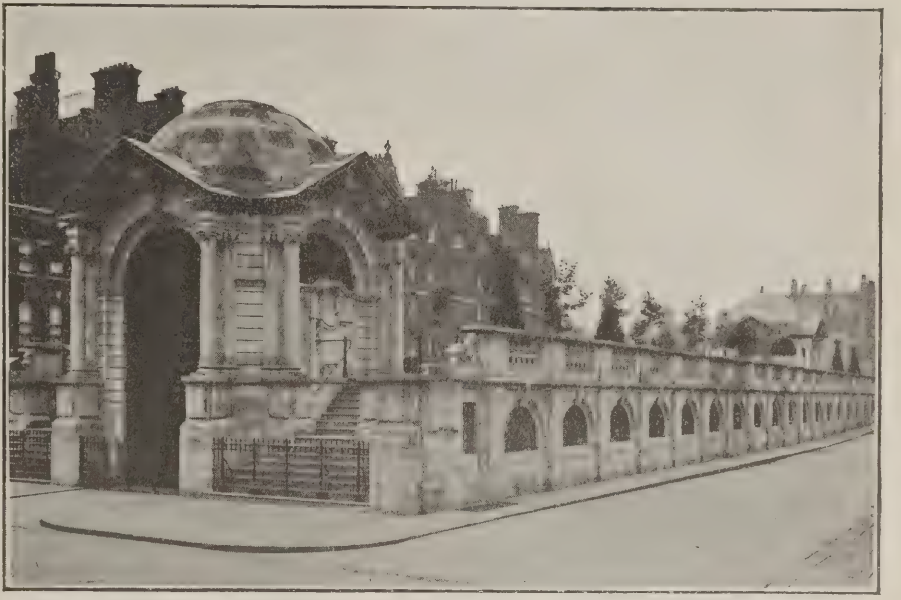
After the close of Earl's Court Exhibition in the autumn, a start was made with the demolition of the Great Wheel, built twelve years ago at a cost of £6,000. The wheel is 280ft. in diameter and weighs 600 tons, and its axle 53 tons. During the course of demolition it was found that many of the rivets had perished, and 20,000 new ones had to be put in before the work could be proceeded with. The wheel is being demolished from the top and equally at both sides, so as to preserve the balance.

The New Vauxhall Bridge. Maurice Fitzmaurice, Engineer; W. E. Riley, Architect, L.C.C.

The New King Edward VII. Bridge at Newcastle-on-Tyne. C. A. Harrison, Chief Engineer, N.E.R., Northern Division.

Steelwork to carry Hammersmith Offices of Great Northern, Piccadilly and Brompton Railway. Drew Bear, Perks & Co., Ltd., Contractors.

Milburn House, Newcastle-on-Tyne. Oliver, Leeson and Wood, and Marshall and Tweedy, Architects. (Concrete floors, reinforced with expanded steel.)



Motor Generator Station, Duke Street, Mayfair, London, W. C. Stanley Peach, F.R.I.B.A., Architect.

New Pavilion and Café at Bridlington. Mangnall and Littlewoods, Architects.

Electricity Generating Station, Sumner Lane, Birmingham. Ewan Harper and Brother, Architects.

Reinforced Concrete Bridge (Hennebique System), Stanford, Worcestershire. Hugh Woodcock, Consulting Engineer.

INSTITUTE AND ASSOCIATION MATTERS.

The year has been notable for the number of distinguished architects who, with the new era inaugurated by the Board of Architectural Education, have joined hands with the Institute and have been elected Fellows. Among these are—Mr. Reginald Blomfield, Mr. Walter Cave, Prof. W. R. Lethaby, Mr. E. L. Lutyens, Mr. Mervyn Macartney, Mr. E. J. May, Mr. Ernest Newton, Mr. E. S. Prior, Mr. Halsey Ricardo, Mr. E. P. Warren, Mr. Walter H. Brierley, Mr. R. S. Lorimer, Mr. E. A. Rickards, Mr. C. R. Mackintosh, Mr. Detmar Blow and Mr. H. Bulkeley Cresswell.

At the exhibition of R.I.B.A. prize designs at the Alpine Gallery in January, two men attracted paramount attention—Mr. Walter S. George, who won the Soane medallion with his splendid design embodying the mansion described in Bacon's essay "Of Building," and Mr. Charles Gascoyne, whose Owen Jones Studentship drawings of Italian architecture were most exquisite in colour and composition. The Tite prize was won by Mr. Alick G. Horsnell, of Chelmsford, the subject being "An Open-Air Swimming Bath"; the Grissell gold medal, for the design of a stone skew bridge, by Mr. George Nott, of Leicester; and the Pugin by Mr. G. Drysdale.

A report on architects' registration has been presented during the year by the committee of the Institute appointed to consider the matter. The report was in favour of a scheme for diplomas granted by the Board of Architectural Education, but no definite decision has yet been reached.

The Architectural Association Rifle Club was inaugurated on October 27th by Major-General Lord Cheylesmore.

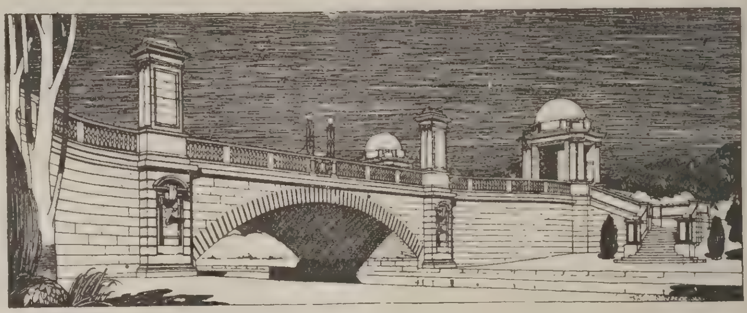
A new Society was formed among architects practising in Gloucestershire, with Mr. F. W. Waller as president.

After some friction, the Ulster Society of Architects decided to terminate its affiliation with the Royal Institute of the Architects of Ireland, and subsequently made application for direct affiliation with the Royal Institute of British Architects.

The fire-resisting floors of the new Manchester Infirmary, for which Mr. Edwin T. Hall is joint architect with Mr. John Brooke, are being constructed of reinforced hollow terra-cotta blocks by the National Fireproofing Co., Ltd., an American combine, who have recently opened a London office.

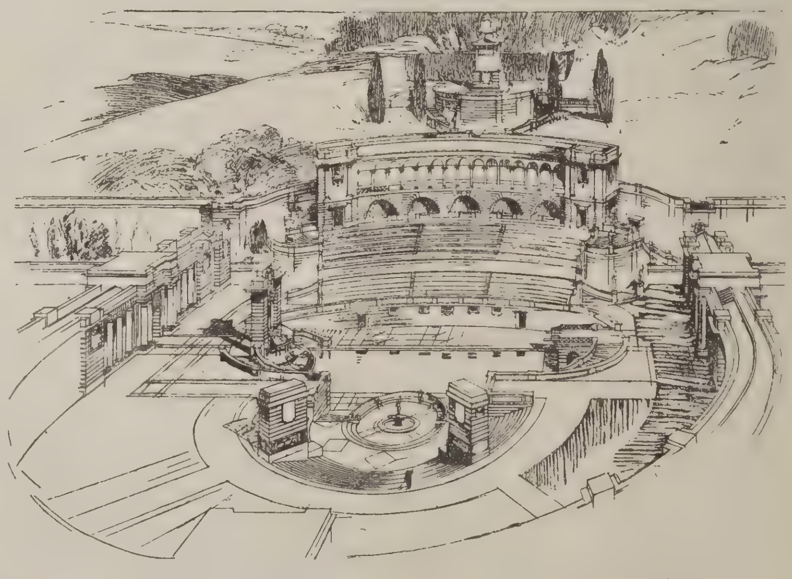
Carl Flohr, the foremost manufacturer of lifts and hoisting appliances in Germany, and one of the old houses in the trade, opened a London office early this year, and is installing automatic push-button lifts of a type novel to the metropolis.

At the Milan Exhibition Messrs. Wailes, Dove & Co. (1906), Ltd., of Newcastle-on-Tyne, were awarded a Gold Medal and Diploma of Excellency for the exhibit of their patent "Bitumastic" enamels, coverings and solution. This firm was also successful in gaining a Gold Medal and Diploma for their exhibits of the same specialities at the Genoa Exhibition held last summer.



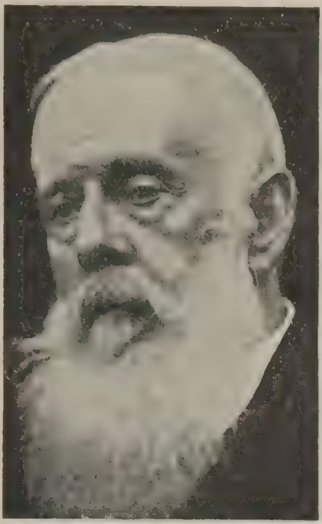
Grissell Gold Medal Design for a Skew Bridge, by G. Nott.

Soane Medallion Design for the Realisation of the Mansion described in Bacon's Essay "Of Building," by W. S. George.



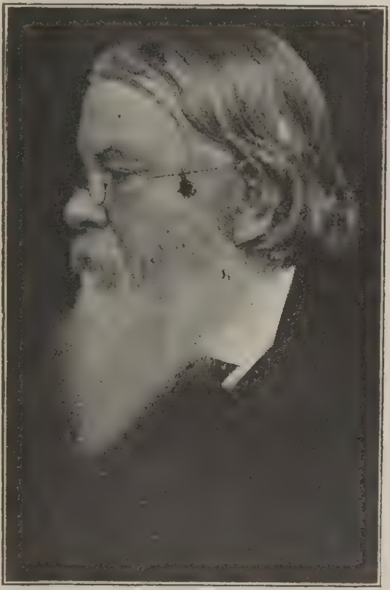
Tite Prize Design for an Open-Air Swimming Bath, by Alick G. Horsnell.

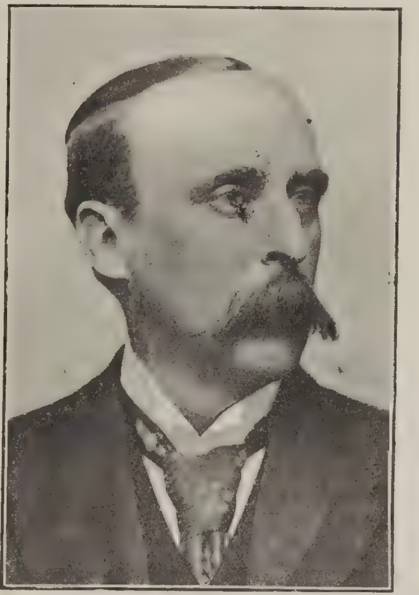
R.I.B.A. PRIZE DESIGNS, 1906.

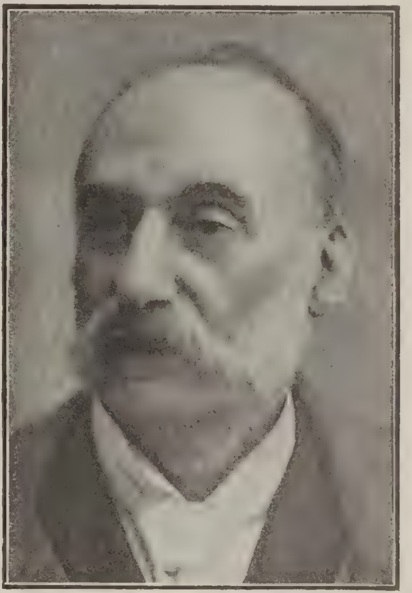

The late J. Henry Christian.

The late John P. Seddon, F.R.I.B.A.

The late Edmund Woodthorpe, M.A., F.R.I.B.A.


The late J. T. Micklethwaite, F.S.A.


The late Bradley Batsford.


The late Edward Salomons, F.R.I.B.A.

OBITUARY, 1906.

Mr. Thomas Garner died in May, aged 67. He did a great deal of church work, both individually and in partnership with Mr. G. F. Bodley, including the fine church at Hoar Cross, Staffs, and St. Augustine's, Pendlebury, near Manchester. He was responsible for most of the firm's work at Oxford, as also for Hewell Grange (Lord Windsor's Worcestershire mansion), and the reredos in St. Paul's Cathedral. The crowning work of his arduous life was the beautiful chancel of Downside Abbey, near Bath, beneath whose roof his body now reposes.

Mr. J. T. Micklethwaite, F.S.A., architect and surveyor to the Dean and Chapter of Westminster Abbey, died on October 28th. In his knowledge of the Abbey Mr. Micklethwaite had no rival, save Thomas Wright, clerk of works, who died some months previously, while as an able architect, and an archæologist of great learning, he was widely known.

Mr. John P. Seddon, F.R.I.B.A., died on February 1st, aged 78. He belonged to the old Gothic school of architects, and made a special study of mediæval architecture.

Mr. Edmund Woodthorpe, M.A., F.R.I.B.A., surveyor for the Northern District of the City of London, died on May 3rd, aged 47.

Mr. Edward Salomons, F.R.I.B.A., the well-known Manchester architect, died on May 12th. A native of London, he went to Manchester early in life and started practice there in 1852. He designed various banks, warehouses, and other buildings in the city, and was much sought after as an architect of large residences. Mr. Salomons was one of the founders of the Manchester Society of Architects, and was twice elected president of that body.

Lieut.-Col. J. Gale, F.R.I.B.A., died in August. He was one of the oldest members of the Institute, and designed some of the first of the London Board Schools.

Mr. Thomas Barnes-Williams died on August 8th. He was senior member in the firm of Barnes-Williams, Ford & Griffin, architects, London.

Mr. Stanford White, partner in the well-known firm of McKim, Mead & White, architects, was shot at a roof-garden theatre in New York on June 25th.

Mr. Bradley Batsford, for many years senior partner in the well-known architectural publishing house on High Holborn, died on July 10th in his 60th year. Not long before, his father died, the founder of the firm. The business is now carried on jointly by the late Mr. Bradley Batsford's brother and by his nephew.

Mr. J. Henry Christian, the well-known architect, died on July 3rd, aged 73.

Mr. H. A. Prothero, M.A., F.R.I.B.A., of Cheltenham, died on November 25th, in his 58th year.

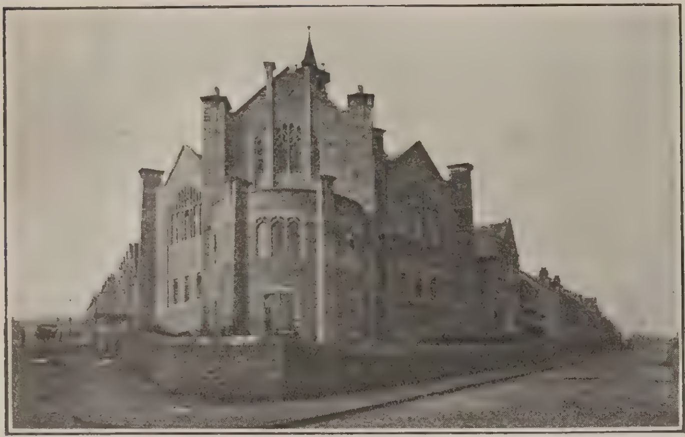
Mr. Ernest Godman, architect, died at Banstead on February 15th. He was the author of works on Norman and Medieval architecture in Essex, and secretary of the Committee for the Survey of the Memorials of Greater London.

Mr John Price, city surveyor of Birmingham, died on March 6th, aged 51.

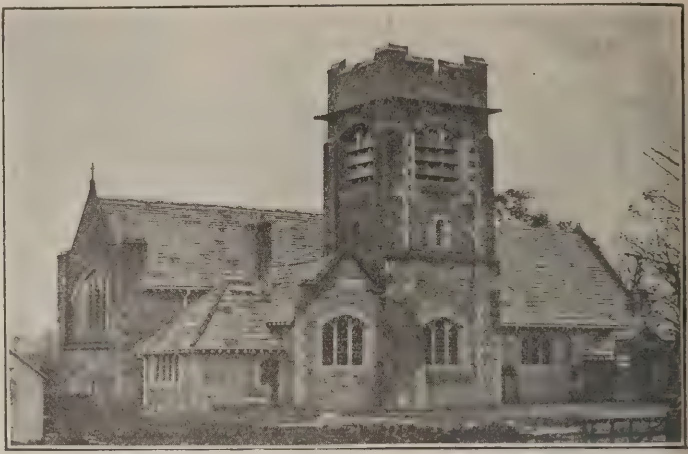
Mr. Charles Long, of the firm of Wylson & Long, theatre architects, London, died in September.

Sir Wyke Bayliss, president of the Royal Society of British Artists, died on April 5th, aged 70. Architecture was the subject of many of his pictures.

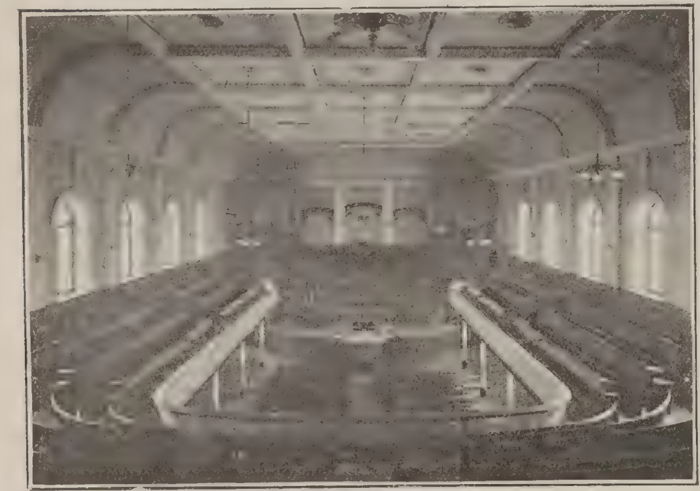
Mr. John Fyfe, the well-known Aberdeen granite merchant, died on July 18th.



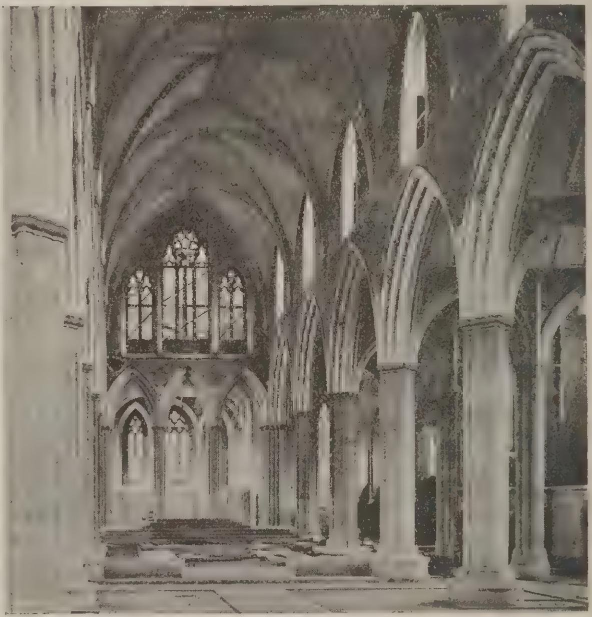
Congregational Church, Crookes, Sheffield. W. J. Hale, F.R.I.B.A., Architect.



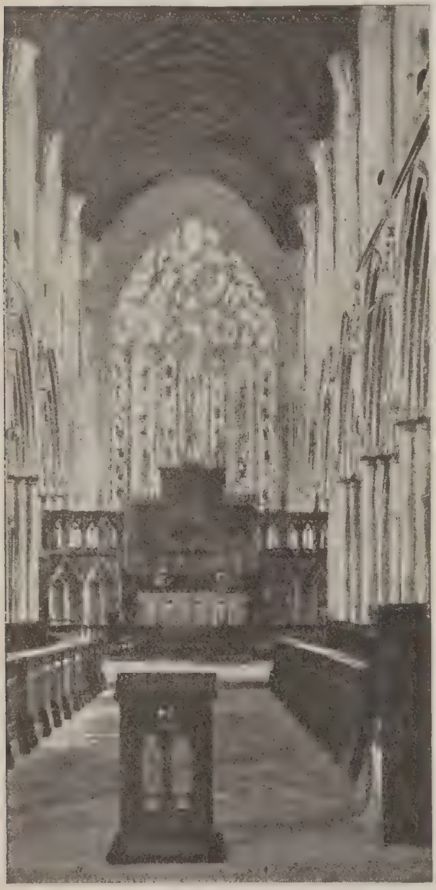
Hellifield Church, Yorks. Connon and Chorley, Architects.



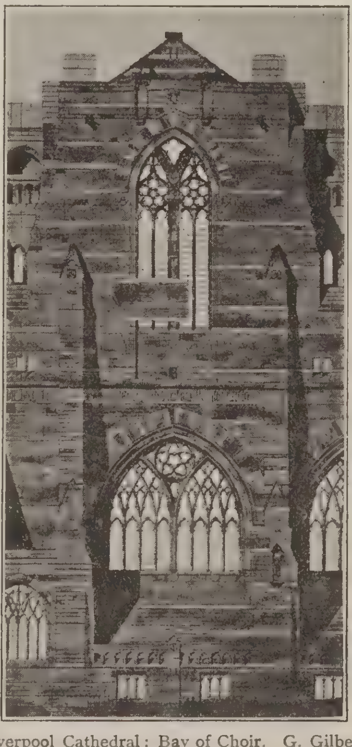
New Central Hall, Commercial Street, Newport, Mon.
Habershon, Fawckner and Co., Architects.



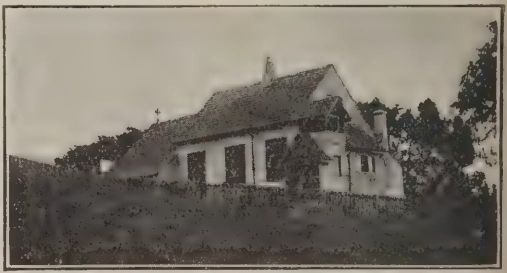
All Saints, Tooting Graveney. Temple Moore, Architect.



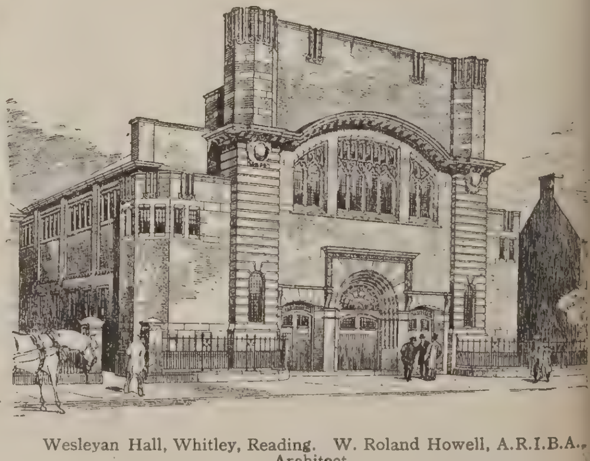
Selby Abbey, Yorks.



Liverpool Cathedral: Bay of Choir. G. Gilbert Scott and G. F. Bodley, Joint Architects.



Mission Church, Cleeve Hill, Cheltenham. E. D. Hoyland, Architect.



Wesleyan Hall, Whitley, Reading. W. Roland Howell, A.R.I.B.A., Architect.

Group on Birmingham Soldiers' Memorial.

MEMORIALS.

A beautiful memorial to the Birmingham men who fell in the South African War was unveiled in June, in Cannon Hill Park, Birmingham. Mr. Albert Toft designed it.

A statue of Charles Kingsley was unveiled at Bideford on February 7th.

A memorial to the late Marquis of Salisbury, in front of the entrance gates to Hatfield House, was unveiled in the autumn. Mr. George Frampton, R.A., was the sculptor.

At Liverpool the Queen Victoria Memorial at the top of Lord Street, after having been completed for some time, was unveiled by Princess Louise on September 27th. It is a well-designed memorial with the seated figure of the Queen below a dome supported by sixteen Ionic columns and crowned by a winged figure of Fame. Mr. C. J. Allen was the sculptor, and Prof. F. M. Simpson and Messrs. Willink and Thicknesse were the joint architects.

Soldiers' Memorial, Cannon Hill Park, Birmingham.
Albert Toft, Sculptor.

CHURCHES AND CATHEDRALS.

St. Columba's R.C. Church, Drumcondra, Dublin, has been erected from designs by Messrs. Ashlin and Coleman.

At Portobello, Edinburgh, a Roman Catholic church has been erected from designs by Mr. J. T. Walford.

A Congregational church has been erected at Crookes, Sheffield, from designs by Mr. W. J. Hale. The plan is octagonal, with transepts, &c.

On November 17th the new tower and spire of Emmanuel Church, Woodhouse Lane, Leeds, was dedicated. Mr. H. S. Chorley was the architect.

At Manselton, Swansea, the new Church of St. Michael and All Angels was consecrated at the end of January. Mr. Bruce Vaughan, of Cardiff, was the architect.

The new chapel in St. Paul's Cathedral was dedicated in June. It is on the south side of the nave and was originally the Wellington Chapel. Mr. Somers Clarke was the architect.

At the Catholic Apostolic Church in Glasgow a north aisle, south and west porches, and other additions were erected from designs by Messrs. Salmon & Son & Gillespie. The original church was built from sketch designs by Pugin.

On July 7th the Bishop of Southwark consecrated the Church of All Saints, Tooting Graveney, built at a cost of £50,000 from designs by Mr. Temple Moore. The plan includes a nave and choir of seven bays, with Lady Chapel beyond.

On October 20th a disastrous fire occurred at Selby Abbey, the nave and choir roofs, pews and other woodwork being destroyed, the reredos demolished, and the stonework generally spalled and damaged. The fire was due to a light left by some workmen engaged in installing a new organ. The damage done has been estimated at £50,000. A scheme of restoration has been drawn up by Mr. J. Oldrid Scott, architect to the Abbey.

On January 31st Christ Church, Down Street, Mayfair, was gutted by fire. The greater part of the roof (which was lined with matchboarding and covered with felt) was destroyed and the woodwork more or less consumed. The outbreak was due to a defect in the heating apparatus.

Considerable anxiety was caused through the subsidences at the eastern end of Winchester Cathedral. Extensive shoring had to be adopted, and subsequently it was found necessary to commence underpinning in order to make the foundations satisfactory. The work is being carried out by Mr. Colson, the cathedral architect, in conjunction with Mr. T. G. Jackson, R.A.

Towards the end of the year considerable attention was directed to St. Paul's Cathedral by reason of the statement made that a serious further settlement had taken place at the south-west corner. The Dean and Chapter appointed a committee of inspection (consisting of Mr. Collcutt, Mr. Belcher and Sir Aston Webb) to go into the matter with the cathedral architect, Mr. Mervyn Macartney, and the cathedral engineers, Messrs. Barry, Leslie & Co. The report of this committee has not yet been published, but in December the Dean and Chapter announced that they had given permission to the London County Council to construct the proposed deep-level sewer beneath St. Paul's Churchyard.

Queen Victoria Memorial, Lord Street, Liverpool.
F. M. Simpson, and Willink and Thicknesse, Architects. C. J. Allen, Sculptor.

On July 17th the Duke of Connaught laid the corner-stone of the chapter-house of Liverpool Cathedral. This forms part

War Memorial, St. Paul's School, Hammersmith.

Sir Lawrence Alma-Tadema, R.A.
(Royal Gold Medallist, 1906).

of the first portion of the building now in process of erection—comprising, in addition, the transepts with their twin towers, the choir, vestries and Lady Chapel. This first portion is estimated to cost £240,000. The choir will not be ready for service for ten or twelve years, but the Lady Chapel is to be completed in four years. The nave of the cathedral will be built after the first section has been finished. The joint architects are Mr. G. Gilbert Scott and Mr. G. F. Bodley, the contractors being Messrs. Morrison & Sons, of Liverpool. In February it was announced that a set of choir stalls would be presented to Liverpool Cathedral by Mr. S. J. Waring (of Waring & Gillow, Ltd.) and his sons, in commemoration of the firm's long connection with Liverpool. These stalls will be carved in Messrs. Waring & Gillow's workshops, from designs by Mr. Bodley. The cost will be nearly £8,000.

At Cleeve Hill, Cheltenham, a mission church was erected from designs by Mr. E. D. Hoyland. The construction is of timber framing with "Frazzi" filling for walls, rough-cast externally, with cement dado inside.

At Westminster Cathedral the new baldachino and the canopy for the Archbishop's throne were completed, the architects being Messrs. J. F. Bentley and Son.

PERSONAL.

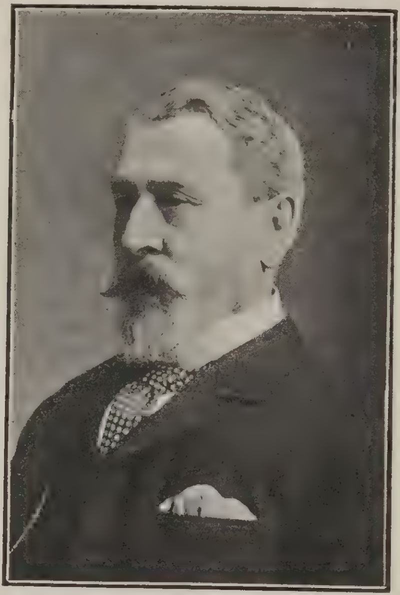
Sir Aston Webb, R.A., was awarded the first Gold Medal of the American Institute of Architects.

Sir Lawrence Alma-Tadema, R.A., was awarded the Royal Gold Medal for 1906.

Mr. T. E. Collcutt was elected president of the R.I.B.A. in June. Later he was elected a *membre d'honneur* of the Société Centrale d'Architecture de Belgique.

Mr. R. S. Balfour was elected president of the Architectural Association, in succession to Mr. E. Guy Dawber.

Mr. Reginald Blomfield, A.R.A., was appointed Professor of Architecture at the Royal Academy in succession to Mr. George Aitchison, R.A. Mr. Blomfield was also elected an Honorary Fellow of Exeter College, Oxford.



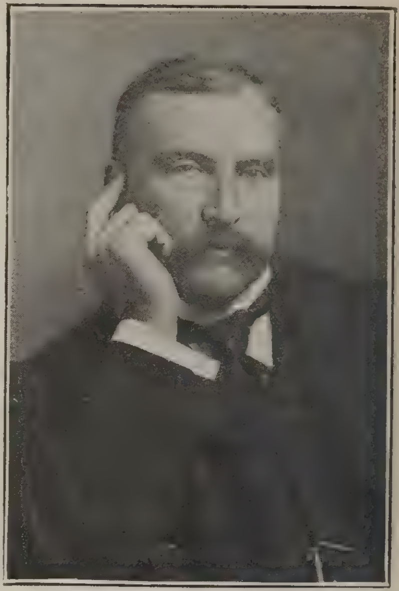
T. E. Collcutt,
President of the Royal Institute of British Architects.

R. S. Balfour, F.R.I.B.A.,
President of the Architectural Association.

Sir A. Brumwell Thomas, F.R.I.B.A.

Mr. A. Brumwell Thomas, F.R.I.B.A., architect of the new City Hall at Belfast, and the new Town Hall at Woolwich, was included among the new knights in the November birthday honours list.

At the Milan Exhibition Mr. E. T. Hall was awarded a gold medal for hospital design, and Mr. H. Percy Adams a gold medal for architectural works.



Mervyn Macartney, F.R.I.B.A.,
Architect to St. Paul's Cathedral.

Mr. R. Phenè Spiers retired from the mastership of the Architectural School at the Royal Academy.

Mr. W. D. Caröe was elected Master of the Worshipful Company of Plumbers.

Mr. A. E. Pridmore was re-elected president of the Society of Architects.

In January Mr. Pomeroy, the well-known sculptor, was elected an A.R.A.

Mr. D. S. MacColl was appointed keeper of the Tate Gallery, in succession to Sir Charles Holroyd, now Director of the National Gallery.

The first gold medal of the Institute of British Decorators was presented to Sir William Richmond on November 26th, in consideration of his work at St. Paul's Cathedral.

At the end of February a complimentary dinner was given to Prof. Henry Adams by students who had worked under him at the City of London College, where he was professor of engineering for 35 years.

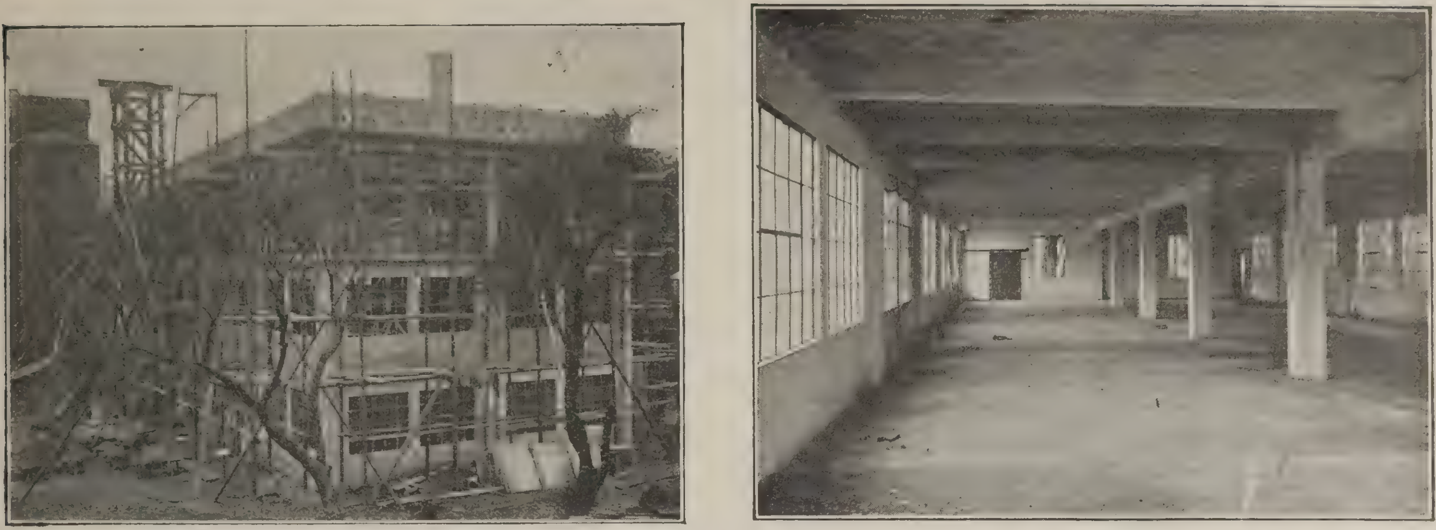
Among those returned to Parliament in the General Election last January was Mr. T. B. Silcock, of the firm of Silcock and Reay, architects, of Bath.

Mr. G. F. Bodley, R.A., went to Washington in November in order to consult the authorities about the Protestant Episcopal Church which is proposed to be built on Mount St. Albans, Washington. This will be the largest cathedral in the United States.

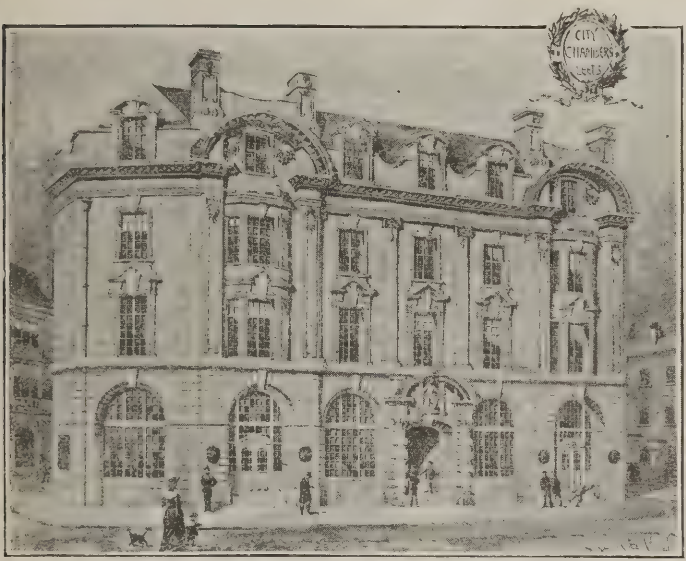
Mr. Mervyn Macartney, F.R.I.B.A., was appointed consulting architect to the Dean and Chapter of St. Paul's Cathedral, *vice* Mr. Somers Clarke, F.S.A., resigned.

Prof. W. R. Lethaby was appointed surveyor of the fabric of Westminster Abbey, and Mr. Arthur G. Wallace was appointed assistant surveyor.

The seventh International Congress of Architects was held in London in July. There was a large attendance of delegates from all over the world, and many papers on architectural and kindred subjects were read at the numerous meetings, and resolutions passed.



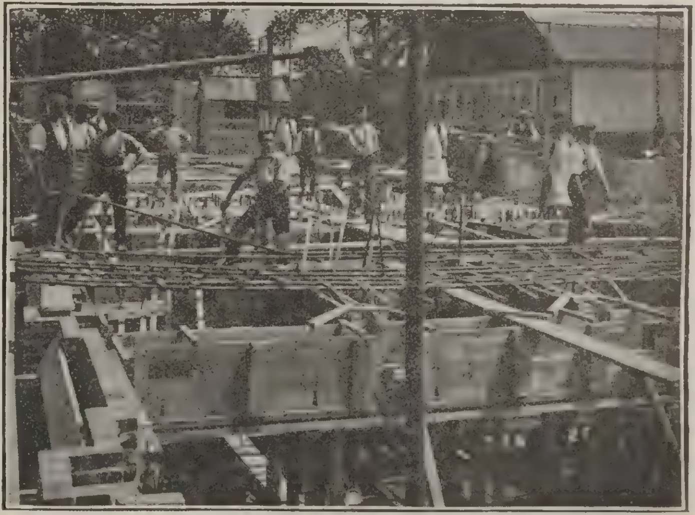
Reinforced Concrete Factory (Kahn System) for Hudson Scott and Sons, Ltd., Carlisle. H. W. Taylor, A.M.I.C.E., Engineer.



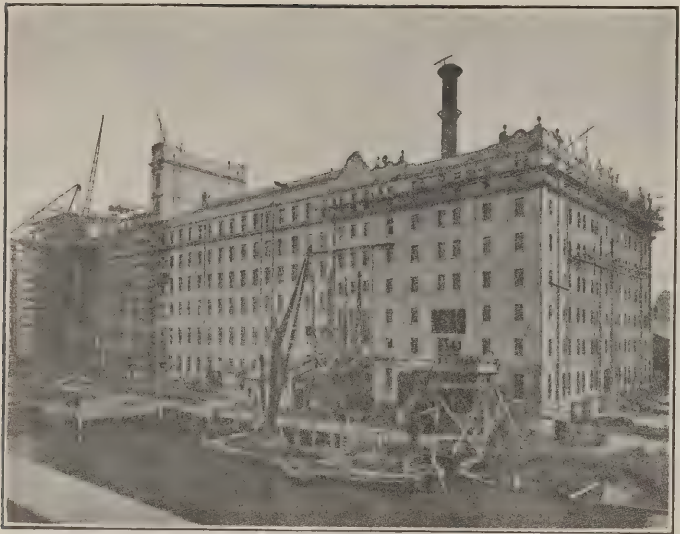
City Chambers, East Parade, Leeds. Perkins and Bulmer, Architects.
Floors of Reinforced Concrete, Kahn System.

Nos. 1—4, Lombard Street, London, E.C. Dunn and Watson, Architects.
Reinforced Concrete Beams and Landings, Kahn System.

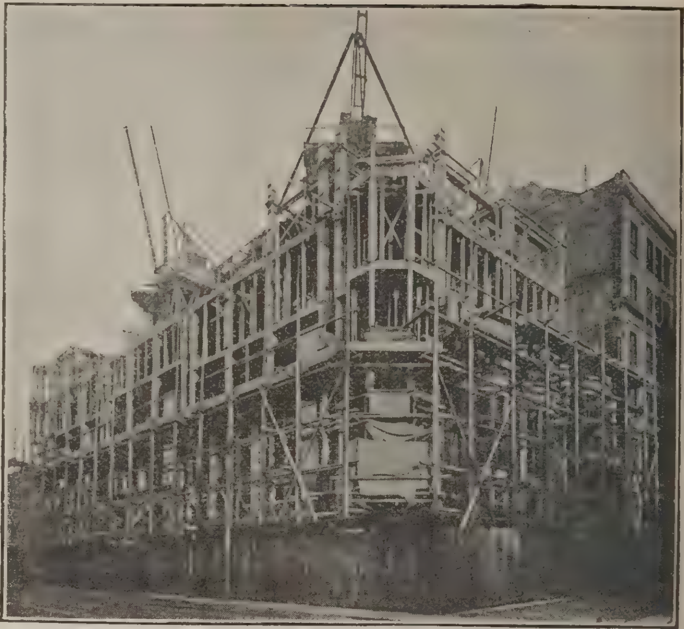
Reinforced Concrete Floor (Kahn System), Whitbread's Brewery, London, E.C.
W. Dixon, Architect.



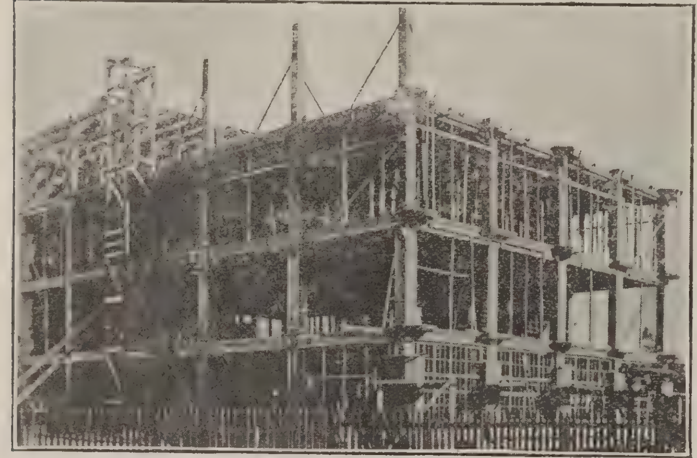
Reinforced Concrete Warehouse Floor, King Street, Norwich.
Morgan and Buckingham, Architects. E. P. Wells, Engineer.



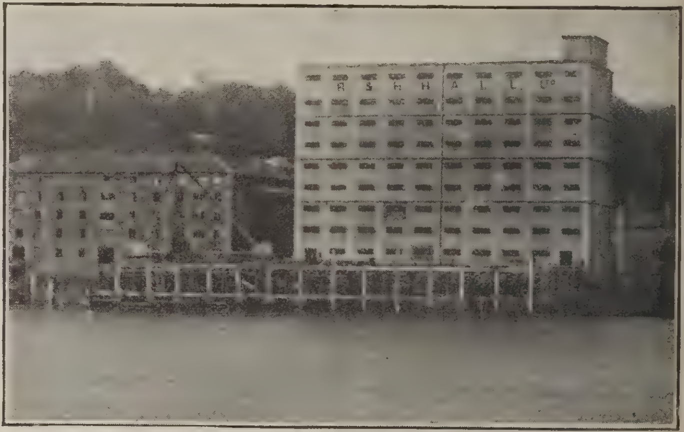
Reinforced Concrete Flour Mills (Hennebique System) at Victoria Docks, London, for Vernon & Sons. William Cubitt, Contractor.



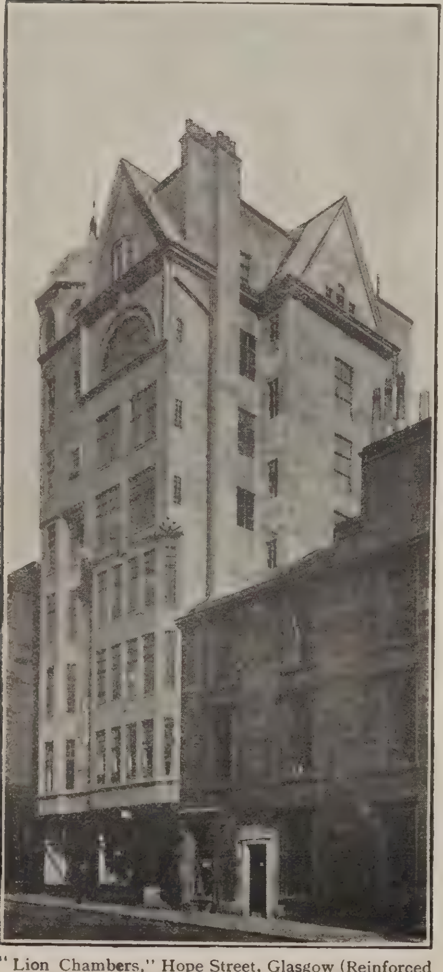
Reinforced Concrete Warehouse (Hennebique System) for the Colne Co-operative Society, Colne.



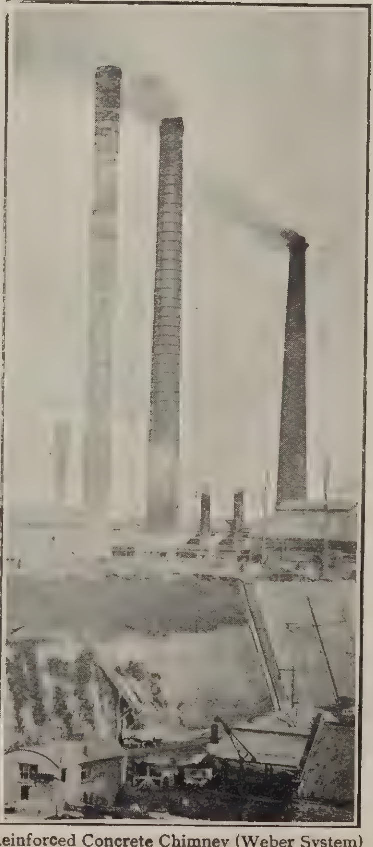
Reinforced Concrete Factory (Hennebique System) at York, for Rowntree & Co., Ltd.



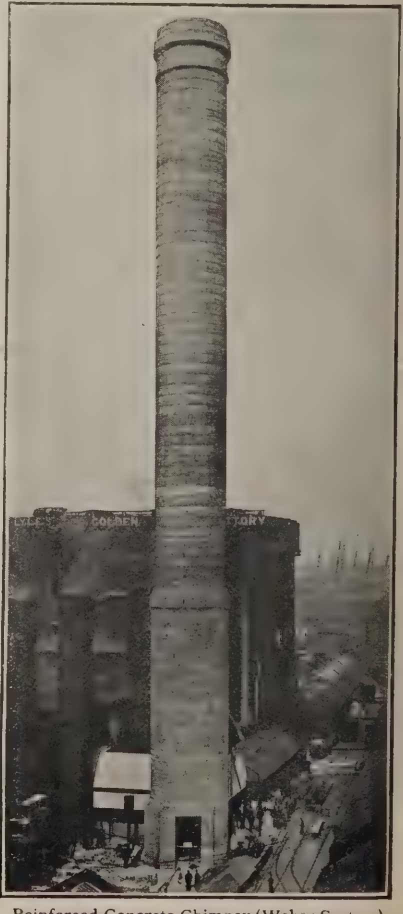
Reinforced Concrete Grain Warehouses (Hennebique System) at Waterford for R. & H. Hall, Ltd. W. Friel, Harbour Engineer.



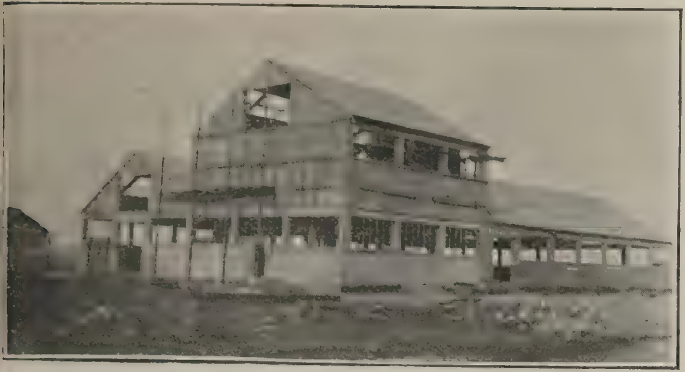
"Lion Chambers," Hope Street, Glasgow (Reinforced Concrete on Hennebique System). Salmon & Son and Gillespie, Architects.



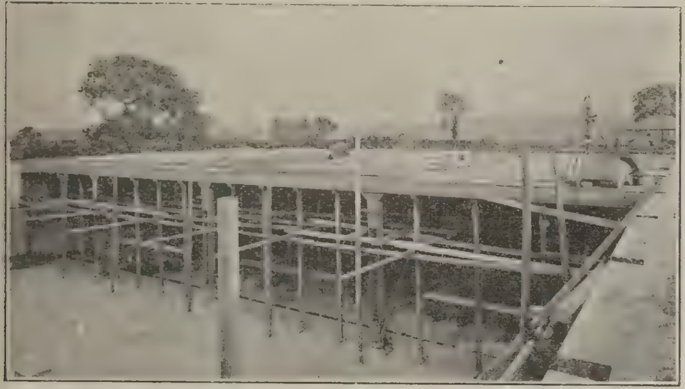
Reinforced Concrete Chimney (Weber System) at Associated Portland Cement Manufacturers, Works at Northfleet.



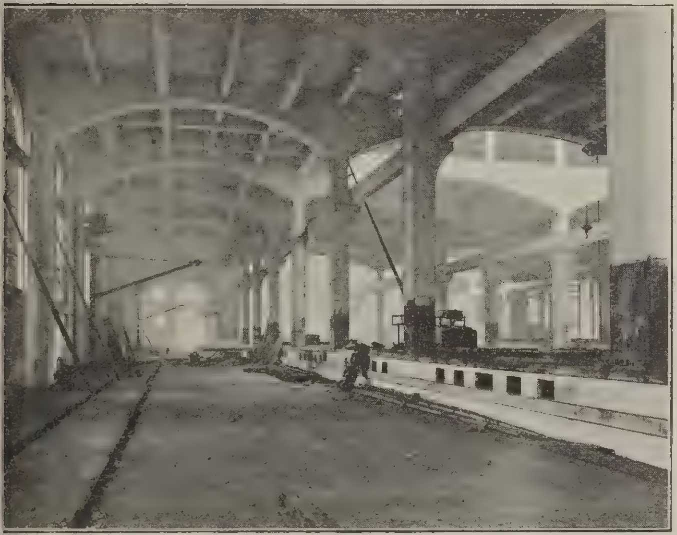
Reinforced Concrete Chimney (Weber System) at Lyle's Refinery, Victoria Docks, London.



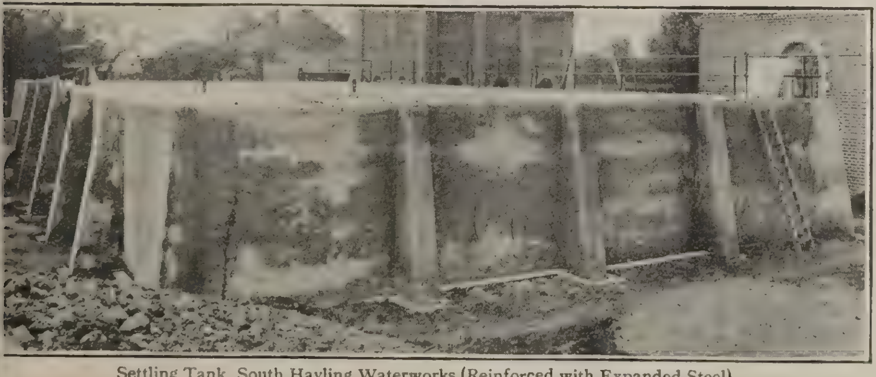
Reinforced Concrete Warehouse (Coignet System) at Rainham, Essex, for J. C. and J. Field, Ltd. Scott, Hanson & Fraser, Architects.



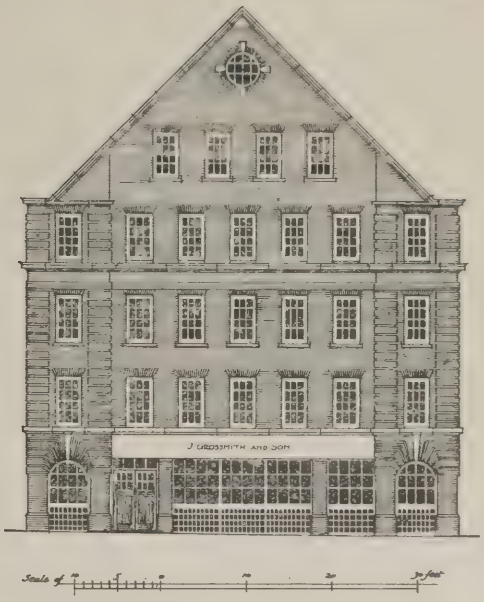
Concrete Reservoir, Downside Abbey (Cover Reinforced by Indented Bars).



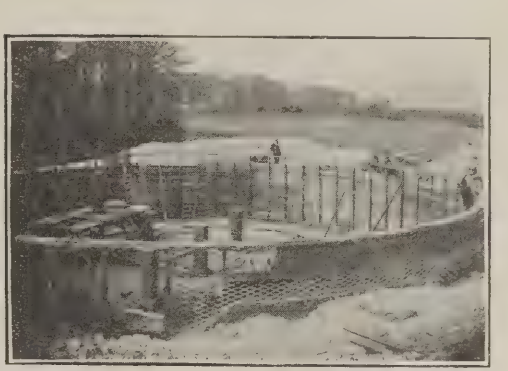
New Bridge Street Goods Station, Newcastle-on-Tyne. (Reinforced Concrete on Hennebique System.)



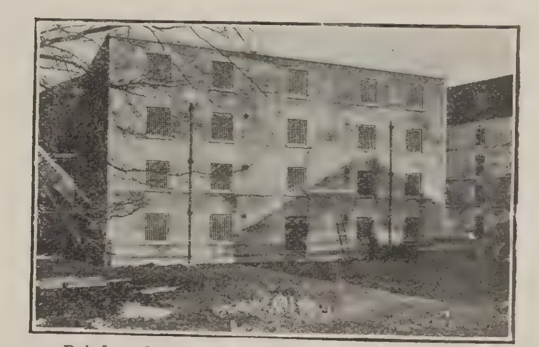
Settling Tank, South Hayling Waterworks (Reinforced with Expanded Steel)



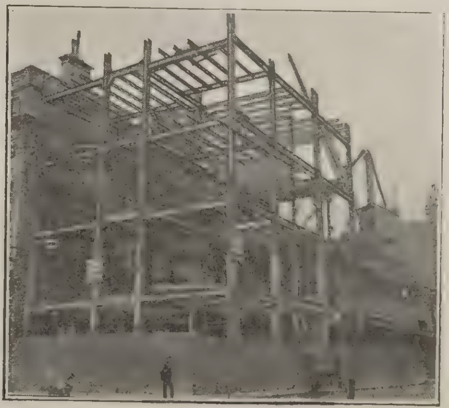
Building in Duke's Head Passage, London, E.C. (Reinforced Concrete Floor and pillars on Coignet System.) H. A. Saul, A.R.I.B. ., Architect.



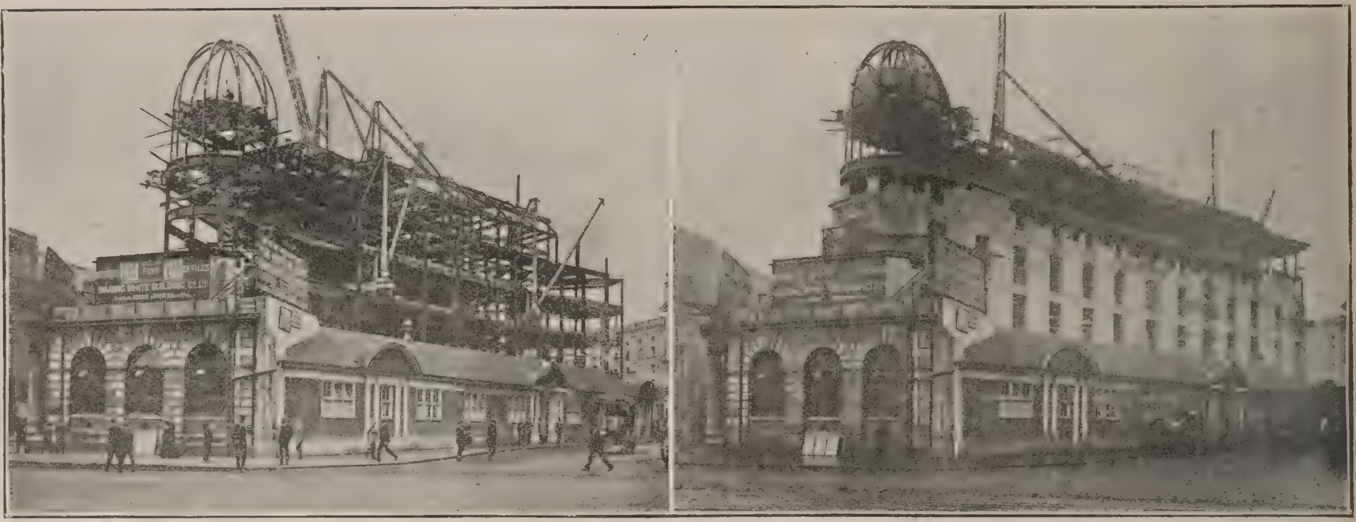
Reinforced Concrete Circular Tank (Expanded Metal System), at Hursley Park, near Winchester. A. Marshall Mackenzie & Son, Architects.



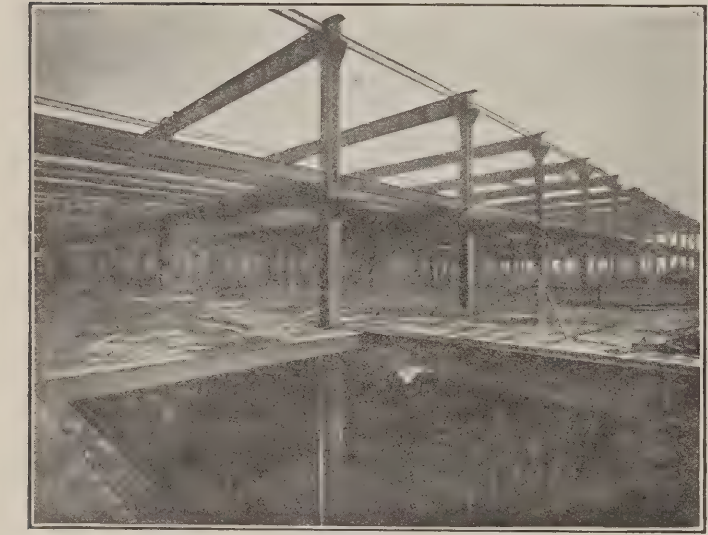
Reinforced Concrete Malting Store, (Expanded Metal System), at Beamish & Crawford's Brewery, Cork. L. A. McDonnell, M.R.I.A.I., Architect.



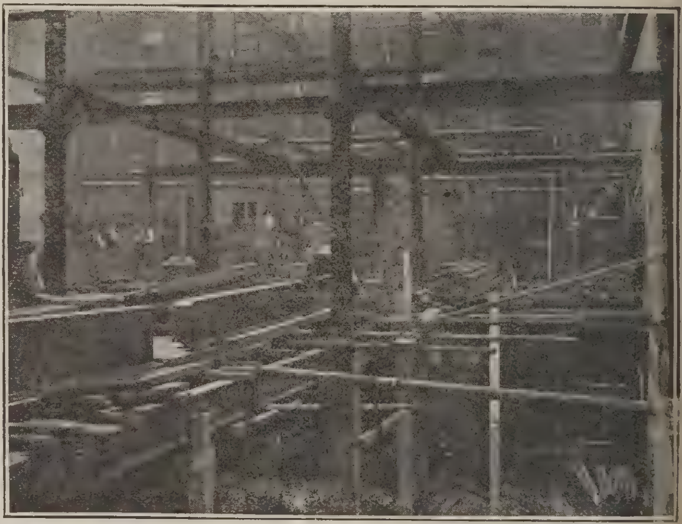
Gloucester House Flats, Piccadilly, London. Collcutt & Hamp, Architects. Steelwork by Drew-Bear, Perks & Co, Ltd.



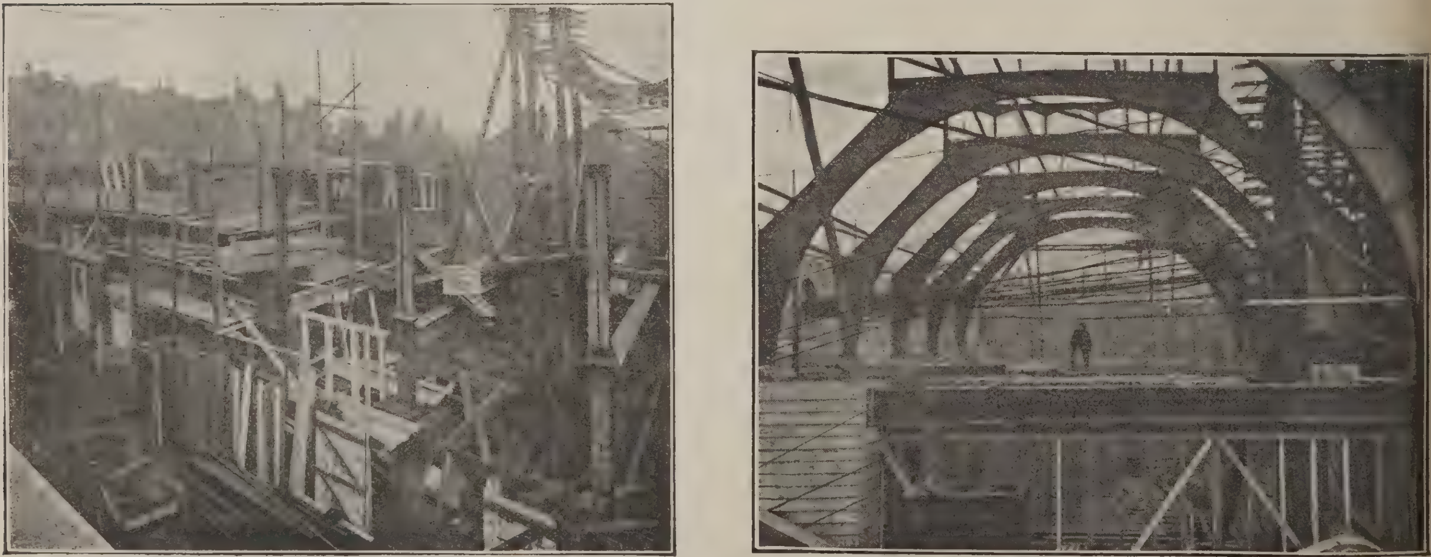
The "Morning Post" Building, Aldwych, London. Mewès & Davis, Architect. S. Bylander, Engineer for Steelwork. (Reinforced Concrete Floors on Columbian System External Norwegian Granite facing by A. & F. Manuelle, Ltd.)



College Goods Station, Glasgow, for North British Railway. Reinforced Concrete Floors on Expanded Metal System. (Steelwork by Redpath, Brown & Co., and the Brandon Bridge Building Co.

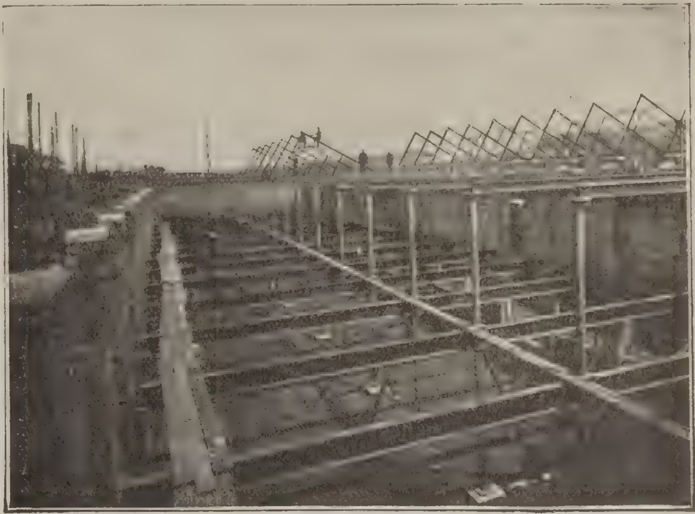


Messrs. Sanderson's New Premises, Berner's Street, London. L. A. Hayes. Architect (Steelwork by D. G. Somerville & Co.)



National Telephone Co.'s Premises, Paddington. Leonard Stokes, F.R.I.B.A., Architect (Steelwork by D. G. Somerville & Co.)

Aberdeen Theatre in course of construction. F. Matcham & Co., Architects (Steelwork by Drew-Bear, Perks & Co., Ltd.)



New Enfield Cycle Co.'s Works at Redditch in course of construction (Steelwork by the St. Pancras Ironwork Co., Ltd.).

REINFORCED CONCRETE.

The use of reinforced concrete for architectural and engineering structures has made great strides in the past year, and a number of important contracts have been completed, while a still larger number have been settled and are in course of construction or are to be started immediately. Undoubtedly the most important contract decided is that for the extension to the General Post Office in Newgate Street, London, but this work has not yet been begun.

We publish views of some of the most important jobs.

Two of the largest American systems made their appearance in the English market this year—namely, the Kahn Trussed Bar and the Indented Bar. Both have made substantial progress, while the older established specialists have done much better than formerly.

The Kahn system has made remarkable progress since commencing last February, due to the energy of Mr. Moritz Kahn, the European representative, whose portrait is published on this page. Mr. Kahn was born in December, 1879, at Berlin, Germany, was taken to America in 1881, and received his engineering training in the University of Michigan, U.S.A.

Below we give lists of a few of the most important contracts in the various systems completed or settled upon this year.

The Trussed Concrete Steel & Co. (Kahn System).

Factory, Carlisle, for Hudson, Scott & Sons, Ltd. H. W. Taylor, A.M.I.C.E., engineer.
Coal Hopper, Bevan's Cement Works, Northfleet. C. P. Taylor. A.M.I.C.E., engineer.
Extensions to Town Quay, Southampton. A. Cooper Poole, A.M.I.C.E., engineer.
Administrative Block, Peter Brotherhood's Works, Walton, Peterborough.
Bridges at Lucker and Lilburn, Northumberland. H. W. Taylor, A.M.I.C.E., engineer.
Arching, Cobwall Covering, Blackburn. W. Stubbs, A.M.I.C.E., engineer.
Coal Hopper and Floors, Cement Works, Swanscombe, Kent. C. P. Taylor, A.M.I.C.E., engineer.
Cooling Tower, Central London Railway, Shepherd's Bush. H. F. Parshall, M.I.C.E., engineer.
Rainwater Tank, Leiston, Suffolk, for R. Garrett & Sons, Ltd.
Wall, Felixstowe Mills, Felixstowe. Brown and Burgess, architects.
Floor, Whitbread's Brewery, London, E.C. W. Dixon, architect.
Foundations, Reservoir, Chilcompton.
Floors, City Chambers, East Parade, Leeds. Perkins and Bulmer, architects
Roof, Chronic Block, Norwich City Asylum. A. Collins, M.I.C.E., engineer.
Beams and Landings, 1-4, Lombard-street, London, E.C. Dunn and Watson, architects.
Strengthening Tar Tank, Poole, Dorset. H. W. Woodall, engineer.
Floors, roof, etc., East Anglian Cement Works, Shepreth, Herts
Decking, Ryde Pier, Ryde, I.W., for L.B. & S.W. Joint Railway Companies.
Floors and Roof, 54-55, Berners-street, London, W. L. A. Hayes, A.R.I.B.A., architect.
Beams, Bournemouth Gas & Water Co., Bournemouth. H. W. Woodall, engineer.
Floor and Kiln Roof, Sanitas Works, Limehouse, London, E. A. T. Bolton, A.R.I.B.A., architect.
Public Baths, Lime-grove, Shepherd's Bush, for the Hammersmith Borough Council. J. E. Franck, A.R.I.B.A., architect.
Lintels, Scottish Provident Building, Glasgow.
Floor, Factory, Goldsmith-row, E. Horace Helsdon, F.R.I.B.A., architect.
Battery Roof, R.E. Forth Defences, Kinghorn, N.B.
Roof Beams, Roker Church, Sunderland. A. Randell Wells, architect.
Floors, Horsforth Hospital, Leeds. A. Walker & Sons, contractors.
Floors, Co-operative Stores, Tamworth. F. Andrews, A.R.I.B.A., architect.
Beams, Blyth Lighthouse, Northumberland. A. Watt Sandemann, engineer.
Foundations, Union Bridge Widening, Aberdeen. G. R. G. Conway, engineer.
Bridge Widening, Broadheath, U.D.C., Broadheath. Maxwell & Tuke, engineers.
Floors and Roof, Repository, Rye, Sussex. Philip Tree, F.R.I.B.A., architect.
Floors and Beams, Leeds Forge, Leeds. Perkins and Bulmer, architects.
Factory, Histon, Cambs, for Chivers & Sons.
Foundations, Shops, Belfast. W. D. R. Taggart, engineer.
Foundations, Factory, Purfleet, for the Vacuum Oil Co., Ltd.

Stuart's Granolithic Stone Co., Ltd. (E. P. Wells's System).

Hull Town Hall, Law Courts Section.
Newcastle Grammar School.
Floor for Oil Mills, Sculcoates, Hull.

Moritz Kahn.

"Dundee Courier" Annexe, Dundee.
Japanning Stoves and Roof, Beeston.
Floors, Staircases, &c., 103-104, Cheapside, E.C.
Columns, Floors, Staircases, &c., Rochester Technical Institute.
Warehouse Floors, Staircases, &c., High-street, Manchester.
Technical Institute, Bury St. Edmunds.
Grammar School, Maldon, Essex.
Technical Institute, Erith.
Warehouse Floors, Barking.
Schools, Haverhill, Suffolk.
Chocolate Factory, Galleywall-road, S.E.
Stables, Holborn.
Tank, Mansion House Chambers, E.C. (10ft. head of water).
Tank and Roof to carry Railway Trucks, Beeston.
Floors, &c., Beeston.
Floors, Royton Schools.
Chocolate Factory, Portobello.
Private House, Little Hampden, Bucks.
Factory Floors, &c., Venesta, Ltd., Millwall, E.
Furniture Depository, York-road, N.
Davidson-road Schools, Croydon.

F. Bradford & Co. (E. P. Wells's System).

Star Laundry, Hackney.
Warehouse Floor, King-street, Norwich (5cwt. per square foot, 28ft. span).
Retaining Walls, (34ft. high), Floors, Staircases, &c., Norfolk County Council, Shire Hall, Norwich.
Tank for Messrs. Schweppes, Kensington (8ft. water).
Floors, &c., Hackney Furnishing Co.

Coignet System.

Warehouses, Foundations for Boilers, Economiser, and Gas Engines, Coal Bunkers, Two Bridges, Slipway, &c., at Rainham, Essex, for J. C. & J. Field, Ltd. Scott, Hanson, & Fraser, architects.
Shop Premises, Lyme-street, West Hartlepool, for M. Robinson & Sons, Ltd. Barnes and Burton, architects.
Floors, Pillars, &c., Premises in Duke's Head Passage, London, E.C., for J. Grossmith, Son & Co., wholesale perfumiers. H. A. Saul, A.R.I.B.A., architect.
Floors, Pillars, &c., Extension to Goodman-street Works, Birmingham. Buckland and Farmer, architects.
Strong Room and Partition Walls, Hatton Garden, London, E.C., for Stewart Dawson. Niven and Wigglesworth, architects.
Strong Room, Southampton, for Messrs. Thorneycroft. Scott, Hanson, and Fraser, architects.
Strong Room, St. James's-street, London S.W., for the London & County Banking Co., Ltd. Thompson and Walford, architects.

Patent Indented Steel Bar Co., Ltd. (Johnson System).

Floors, Waldorf Hotel, Aldwych, London. A. Marshall Mackenzie & Son, architects.
Reservoir, Downside Abbey (600,000 gallons).
Factory for Coventry Ordnance Co., Glasgow.
Foundations of Factory, Northfleet, for Wall-paper Manufacturers, Ltd.
Foundations of Chimney at Bootle, Lancs.

Homan & Rodgers (Waved Tee Bar).

Floors at: Brentwood Asylum, Isleworth; Workhouse Infirmary, Coventry; Daybrook Laundry, Nottingham; Welsh C.M. Chapel, Hammersmith; Talbot Hotel and Shops, Wrexham; Brunswick Council School, Cambridge; Nurses' Home, Rotunda Hospital, Dublin; Savings Bank, Preston; Workhouse Infirmary, Otley; School of Art, Burslem; Holmbrook Hotel, Preston; Warehouse, Compton Mills, Leek; Doubling Mill, Barrow Ash; Broomhall Schools, Nantwich; Congregational Church, Burslem; Barnton School, Northwich; Summit Works, Walsall; Additions to Rockside Hydro, Matlock; Workhouse Infirmary, Atherstone; Union Infirmary, Boston; Science Schools, Warwick; Alvaston Schools, Derby.

New Expanded Metal Co., Ltd.

Floors, &c., Milburn House, Newcastle-on-Tyne.
Floors, &c., Pavilion and Café, Bridlington.
College Goods Station, Glasgow, for North British Railway Co.
Circular Tank at Hursley Park, near Winchester (56ft diameter, 10ft. depth of water).
Malting Store at Beamish & Crawford's Brewery, Cork (Floors, Walls, and Roof).
Settling Tank at South Hayling.
Floors, &c., Marischal College, Aberdeen.
Floors and steelwork encasing, Hull General Post Office.
Floors, Superstructure, Holborn Tube Station, London.
Concrete Domes and Corridors, Victoria and Albert Museum, South Kensington.
Cadbury's New Factory, Bournville, near Birmingham.
Public Baths, South Shields.
Public Baths, Manor Street, Chelsea, S.W.
Sea Wall at Hornsea, near Hull.
Schools, Gainsborough.
New Isolation Hospital Cheshunt.
Scunthorpe Reservoir.
New Public Baths, Shepherd's Bush.
Floors, &c., Messrs. Todd, Burns' Premises, Dublin.
Foundation Raft, New Generating Station, Blackfriars, S.E.
New Underground Electric Railway Stations.
Decking, L.C.C. Bridge, Denmark Hill, S.E.
Floors, G.E.Ry. Generating Station, Stratford.
Sewage Tanks, Greystones, Ireland.
Co-operative Bakery, Winsford.
Floors, General Post Office, Aberdeen.
Floors, North End Spinning Mill, Bolton.
Floors, Artisans' Dwellings, Kingstown.
Floors, Scottish Provident Institution, Glasgow.
Pumping Station, Chandlers Ford.
Aqueducts and Tanks, Loch Leven Water Supply.
Reservoirs: Tranmere, Birkenhead; Waterworks: Colchester; Wilford Hill, Nottingham; Cranleigh; Highbridge, and Sevenoaks.
Floors, Oak View Mills, Greenfield.
Woolwich Arsenal.
Floors, Armstrong, Whitworth & Co.'s Works, Elswick.
Floors, Strood Generating Station.
Floors, British Museum Extensions.
Floors, &c., New Offices for Messrs. Vickers, Sons and Maxim, Sheffield.
Floors, Edinburgh and Leith Gas Works, Granton and Newport Gas Works.
Floors and Roofs, Shepton Mallett, Northallerton and Gloucester Prisons.

Richard Johnson, Clapham & Morris, Ltd. (Johnson's Wire Lattice System).

Coke Oven Floors, Leeds, for Mackey-Seymour Eng. & Coke Oven Co.
Office and Warehouse Floors for Dixon & Heydorn, London and Barking.
Bridge Deck Work, Regent's Park (two more bridges to be started immediately), for H.M. Office of Works.
Deck work, Ryde Railway Pier (one bay 9ft. 4in. wide, by about three-quarters of a mile), for L. & S.W. and L.B. & S.C. joint companies.

William Cubitt & Co.

Flour Mills at Victoria Docks, London, for Vernon & Sons (Hennebique System).

L. G. Mouchel (Hennebique System).

Extension to the General Post Office, Newgate-street, London, for H.M. Office of Works. Sir Henry Tanner, architect.
New Bridge-street Goods Station, Newcastle-on-Tyne. (Roofs covered with "Ruberoid.")
Warehouse, 143, Grosvenor-road, London, for the Associated Portland Cement Manufacturers, Ltd.
Grain Warehouse, Waterford, for R. & H. Hall, Ltd.
Warehouse, Colne, for the Colne Co-operative Society.
New Stationery Offices, Royal Oak, London, for the Great Western Railway Co.
Maise Mill and Silos, Sligo.
Bridge, Stanford, for the Worcestershire County Council (96ft. span).
Grain Silos, Ipswich, for R. & W. Paul.
Goods Station, Canons Marsh, Bristol, for the Great Western Railway Co.
Factory at York, for Rowntree & Co., Ltd.
Warehouse, Dublin, for Hely & Co., Ltd.
Dyeing and Cleaning Works, Belfast, for the Monarch Cleaning Co., Ltd.
Factory at Harrow, for the Kodak Co., Ltd.
Wolseley Works, Birmingham.

Weber Steel-Concrete Chimney Co., Ltd.

The first Reinforced Concrete Chimney erected in England, at Lyle's Refinery, Victoria Docks, London (diameter of flue 20ft., height 261ft. 4in.).
Chimney at Northfleet Works of the Associated Portland Cement Manufacturers, Ltd.
Chimney at Works of Thames Paper Co., Ltd., at Purfleet, Essex.
Chimney near Adisham Kent, for the Foncage Syndicate, Ltd.

STEELWORK.

The year has not been an ordinary one as regards the use of steel in buildings, for the American system of steel-frame construction has been found advantageous and is being increasingly adopted. The Ritz Hotel, Piccadilly, the first thoroughly typical frame building in London, was completed and opened in June. The "Morning Post" building in Aldwych, London, is nearing completion; and the Waldorf Hotel in the same thoroughfare is rising rapidly. The steelwork in all three buildings was designed by Mr. S. Bylander and erected by the Waring White Building Co., Ltd. In London also Messrs. Drew-Bear, Perks & Co., the well-known steelwork contractors, were responsible for steel-frame structures—namely, Gloucester House Flats, corner of Park Lane and Piccadilly (1,400 tons of steel), Nos. 168 to 172, Piccadilly, and a building on the site of St. Philip's Church, Regent Street. This firm were also responsible for interesting steelwork in a building in Long Acre, London, girders and stanchions supporting the Hammersmith offices of the Great Northern, Piccadilly and Brompton Railway for the Underground Electric Railways Co., of London, Ltd. (the whole of this steelwork was delivered, erected and handed over in the short contract time of 12 weeks), the Aberdeen Theatre, and the new Empire Theatre, Sunderland. Messrs. D. G. Somerville & Co. have also carried out steel-frame buildings in London—namely, Messrs. Sanderson's new premises in Berners Street, and the National Telephone Co.'s exchange at Paddington. The latter has an interesting steel arched roof 38ft. span and 80ft. long. The floors and roofs are constructed throughout with Messrs. Somerville's patent system of hollow reinforced concrete tiles. This firm is also responsible for the steelwork of Chelsea Town Hall Extension (Mr. Leonard Stokes, architect).

Messrs. Measures Bros. supplied the steelwork for warehouses at Davis' Wharf, near the Tower Bridge, London.

Another interesting job was the extension of the Queen's Hotel, Birmingham, carried on a new form of cantilever over the platform of New Street Station; this was illustrated in our issue for September 5th.

The first steel-frame building in Edinburgh is in course of erection in Princes Street. Mr. J. J. Burnet, F.R.I.B.A., is the architect.

Another important steel-frame building is the College Goods Station at Glasgow for the North British Railway Co. Messrs. R. McAlpine & Sons were the general contractors. Over 60,000 sq. yds. of expanded steel concrete flooring at two levels are to be found in this building.

Messrs. E. F. Blakeley & Co., of Vauxhall Ironworks, Liverpool, have been very busy throughout the year in the erection of steel buildings, roof principals, churches, &c. They have completed a steel frame and concrete building for Messrs. G. H. Lee & Co., Basnett Street, Liverpool (Messrs. Matear and Simon, architects); also steelwork extensions have been carried out for Messrs. Lever Bros., Ltd., Port Sunlight (Messrs. Wm. and Segar Owen, architects); the Wolverhampton Corrugated Iron Co., Ltd., at Ellesmere Port; electric car sheds at Swinton (Messrs. Matear and Simon, architects); the new grand stand for the Liverpool Football Club (Mr. Archibald Leitch, architect); and churches at Birmingham, Horwich, Blackley, Wallasey, &c.

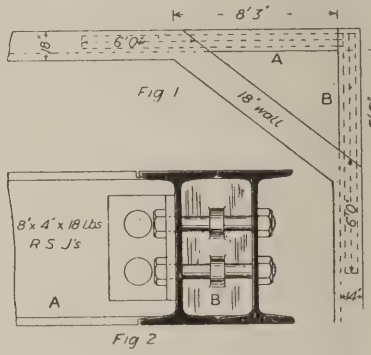
Messrs. Power's and Deane Ransome's Ltd., carried out the steel frame for new printing works at Aylesbury (W. Ernest Hazell, A.R.I.B.A., architect).

The whole of the steelwork for the works of the New Enfield Cycle Co., Ltd., at Redditch and the Adams Manufacturing Co., Ltd., at Beaford, has been carried out by the St. Pancras Iron Works Co., Ltd. The firm have erected steel roofs for the Borough of Devonport, the Western Electric Co. at North Woolwich, the London County Council at the Streatham car sheds, at Banstead Asylum, and at Radcliffe Infirmary, Oxford. They have constructed spiral staircases, air uptakes, inlets and outlets to fans, &c., for the Underground Electric Railways Co. of London, Ltd., and staircases on the City and South London Railways extension. The St. Pancras Ironworks have also erected fire escape staircases at Metropolitan and City Police Orphanage, Strawberry Hill, Hackney New Infirmary, Stock Exchange, Stoke-on-Trent Workhouse, Sheffield Union Infirmary, Portsmouth Union Infirmary, St. Bartholomew's Hospital, Greycoat Hospital, Westminster, Rowton Houses, King's Cross, London, City of London Lying-in Hospital, Lever Bros., Ltd., Works, Port Sunlight, Imperial Tobacco Co. (Gt. Britain), Ltd., Works at Bristol, and at various London houses.

Enquiries Answered.

Joists to Carry Projecting Brickwork.

Wellingborough.—F. writes: "The accompanying sketch shows a splay corner in a building 35ft. high to eaves. From a height of 25ft. to the top this corner has to be brought out square (as indicated by broken line). Up to 25ft. high is an 18-in.



wall and above that height a 14-in. wall. The wall A is the end wall of the building with a gable end for roof of 8ft. 4ins. pitch. No roof principals will rest on the walls. I propose carrying out this corner on two steel joists, depending on the weight on the back portion of the joists to hold up the corner; the joists to be 18ft. long, 9ins. × 7ins. × 54lbs. It is not possible to get a vertical support at *b*, as a railway siding runs underneath. Is this sound construction?"

The accompanying sketch, Fig. 1, shows the plan of walls, the projecting shaded portions on first floor having to be carried on projecting rolled joists. Taking the 14-in. walls as, say, 12ft. mean height, the weight of wall $a = \frac{7\cdot5 \times 12 \times 1\cdot125}{20} =$ 5 tons, giving a bending moment of $\frac{\text{WL}}{2} = \frac{5 \times 7\cdot5}{2} = 18\cdot75$ ton-ft., or a tabular value of $18\cdot75 \times 8 = 150$, the nearest sections being two (B.S.B.15) 9ins. by 4ins. by 21lbs. steel joists. The weight of wall $b = \frac{7 \times 12 \times 1\cdot125}{20} = 4\cdot72$ tons, giving a bending moment of $\frac{\text{WL}}{2} = \frac{4\cdot72 \times 7}{2} =$

16·52 ton-ft., the tabular value will then be 16·52×8=132, requiring two (B.S.B. 11) 8-in. by 4-in. by 18-lb. steel joists. As each joist of this size has a tabular value of 70, or 140 for the pair, using all four this size would give 2×140=280, against the requirements of 150+132=282, which is practically identical. Therefore, the joists will be 8ins. by 4ins. by 18lbs., and must be carried back not less than 6ft. into each wall, as shown in Fig. 1. The joint between the pairs of joists A and B will be as shown in Fig. 2.

HENRY ADAMS.

Thrust from Chancel and Nave Arches.

OLD SUBSCRIBER writes:—"Referring to the accompanying illustration, I shall be glad to know whether there is sufficient abutment on each side of the chancel arch to enable it to support the weight of the tower above without fear of settlement. Is sufficient abutment provided for the nave arches to prevent settlement?"

Fig. 1 shows half elevation and Fig. 2 half plan of chancel arch and abutment. The loads above from tower, &c., are marked on the assumed voussoirs, and the line of thrust is shown by stroke-and-dot line as obtained from Fig. 3. The maximum thrust in the arch reaches about 25½ tons per sq. ft., which is rather high, but this is the maximum possible, and the efficiency of bonding in the work above it may reduce the natural load. Combining the thrust with weight of abutment gives a final resultant nearly in the centre of the foundations, but causes a load of about 5 tons per sq. ft. above the footings. Fig. 4 shows half elevation of the adjoining nave arch with thrust line obtained from Fig. 5. The maximum thrust will be about 12 tons per sq. ft. It will be observed that the buttress has been increased in projection by 1ft. 6ins., which will then leave the maximum pressure on top of the footings 7¼ tons per sq. ft. compression at outer edge.

HENRY ADAMS.

"Sticky" Paint; Compensation for Drain Laying.

LONDON.—A. P. H. writes: "(1) What is the cause of 'sticky' paint? I know of internal paint-work, done six years ago, which is still 'sticky.' (2) On complaint from a tenant a landlord finds it necessary to relay drains which run through a shop. About 12 or 18 months of the agreement remain to run. Can tenant claim compensation for inconvenience during work? The property is to be pulled down for rebuilding immediately after the tenancy expires. It appears to me that the landlord has no alternative but to do the work (to buy the tenant out would cost more than the work), although he has not covenanted to do so. Is that the legal position?"

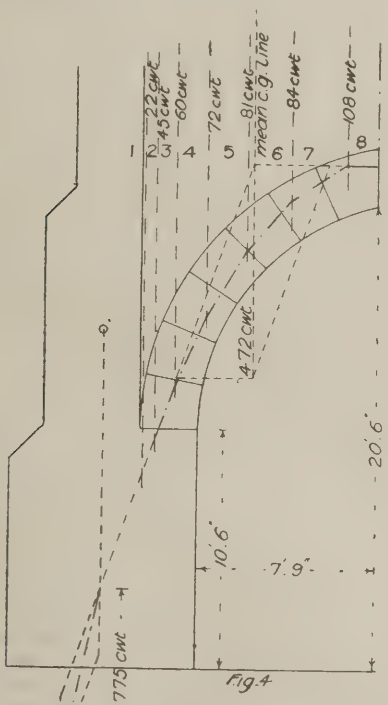


Fig. 4

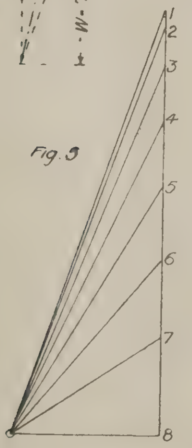


Fig. 5

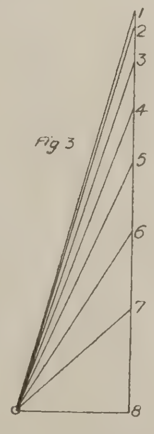


Fig 3

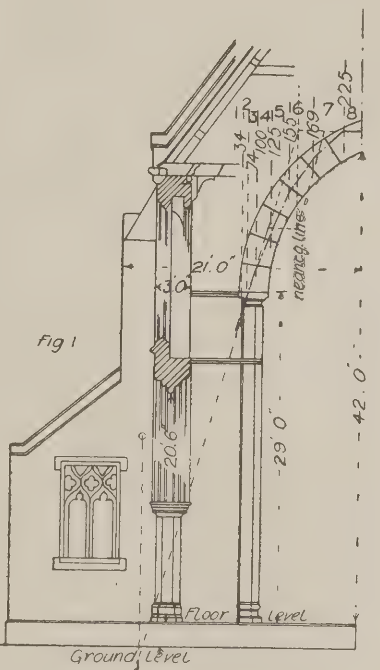


Fig 1

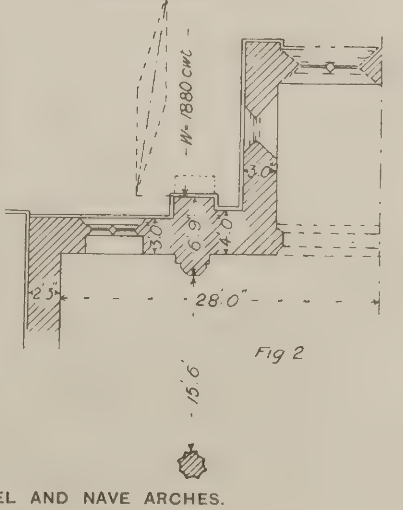


Fig 2

THRUST FROM CHANCEL AND NAVE ARCHES.

(1) The use of bad oil or varnish, non-drying oils being used as substitutes.

(2) We should think not, but the question will turn on the terms of the agreement. Usually there is a clause giving the landlord power to enter and effect all necessary repairs.

Book on Boiler-making.

RUNCORN.—ANXIOUS writes: "Kindly name a good book dealing with practical boiler-making. I may say that I am in possession of one called 'Plating and Boiler-making' by a foreman pattern-maker, but I want something dealing more with the marking-out of work."

Sexton's "Pocket-Book for Boiler-Makers and Steam Users" (E. & F. N. Spon) would probably meet the case.

Views and Reviews.

Hudson's Building Contracts.

We have received Vol. II. (the first vol. will be ready next month) of the above work, containing the reports and precedents. It is almost needless to refer at length to a work which is regarded as a standard authority on this vexed and complicated branch of English Law. In the recent ruling cases reported in this particular volume the disputes seem to have arisen in most instances from discrepancies between drawings, quantities and specification, and in some cases these errors have worked hardly on the contractors, who have been debarred by one of the usual stringent clauses from any remedy. Of course, in the case of many engineering contracts it is an impossibility to give absolute and precise information before the ground is opened and the site is fully disclosed. In the case of *Pearson versus the Dublin Corporation*, the well-known firm of contractors sought to recover damages for loss sustained by fraudulent misrepresentation of the character of a certain existing wall which was to be utilised in the new sewage outfall works at Dublin for which they had contracted. The work proposed was the conversion of an old harbour at the mouth of the Liffey, which had on one side an existing sea-wall some 900ft. long (shown by dotted lines on the engineer's plans to go down 9ft. below ordnance datum), into a dry basin for the reception of sewage tanks, &c. It was essential to the scheme that the wall shown should extend to the depth indicated, so that it was watertight, and the plaintiffs accepted the engineer's plans on this point apparently without question. After closing the harbour mouth with a coffer-dam the plaintiffs found the water pouring under the wall, which practically rested in the surface of the mud. The whole scheme had, therefore, to be revised. The plaintiffs, however, failed to prove the misrepresentation or to get over the stingency of clause 43 of the conditions, which threw all the responsibility, for ascertaining the nature and extent of the existing works, upon them. Another interesting case is that of *Geary, Walker & Co. versus Lawrence & Son*, which turns upon the terms of payment in contracts between a general contractor and his sub-contractors.

The Law of Building, Engineering, and Ship Building Contracts, and of the duties and liabilities of Engineers, Architects, Surveyors, and Valuers; with precedents and reports of cases. By Alfred A. Hudson, of the Inner Temple, Barrister-at-Law. Third edition. 1907. London: Sweet & Maxwell, Ltd., 3, Chancery-lane. Two vols £2 12s. 6d. the two.

Complete List of Contracts Open.

WITH a few exceptions, news of Contracts Open are not repeated after they have been published once in these columns, so that readers will find particulars in our previous issues of other contracts that still remain open.

Unless expressly stated to the contrary, all deposits required for bills of quantities, &c., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair-wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

Dec. 28. Warwick.—*Erection of a workshed at* the Workhouse, Warwick, according to plan and specification, which may be seen at the office of F. P. Trepess, F.I.A.S., 1, Church Street, Warwick, any day (except Saturday) between 10 a.m. and 4 p.m. Tenders, sealed and endorsed "Tender for Workshed," addressed to C. H. Passman, clerk to the Guardians, 48, Bedford Street, Leamington Spa, must be delivered not later than 9 a.m. on Dec. 28.

Dec. 31. Edinburgh.—*Executing the following works*, in connection with the extension of Tower Bank School, Portobello:—1. Mason and Brick Works. 2. Carpenter and Joiner Works. 3. Smith Work. 4. Slater Work. 5. Plaster and Cement Works. 6. Plumber Work. 7. Painter Work. Plans and specifications may be seen, and schedules and measurements may be obtained at the office of Mr Carfrae, architect, 3, Queen-street. Estimates, marked outside "Estimates for ——— Work for Tower Bank School," to be sent to G. W. Alexander, clerk to the board, School Board Offices, Castle Terrace, Edinburgh, not later than Dec. 31.

Jan. 1. Ruthin.—*Erection of new County Offices* to be erected at Ruthin. Builders desirous of tendering are requested to forward their names, together with a deposit of £1 1s. to the County Architect and Surveyor, W. D. Wiles, 42a, High-street, Wrexham, on or before Jan. 1.

Jan. 4. London, S.E.—*Enlargement of the Sorting Office* at Catford, S.E., for the Commissioners of H.M. Works. Drawings, specification, and a copy of the conditions and form of contract may be seen on application to J. Wager, H.M. Office of Works, S.W. Bills of quantities and forms of tender may be obtained on payment of £1 1s. Tenders must be delivered before 12 o'clock noon on Jan. 4, addressed to the Secretary, H.M. Office of Works, &c., Storey's Gate, London, S.W., and endorsed "Tender for Catford Sorting Office Enlargement."

Jan. 7. Hartlepool.—*Erection of about 104 lineal yards* of 9-in. brick boundary wall, with piers, at Holy Trinity Churchyard, Seaton Carew, in accordance with plans and specification to be seen, and further particulars to be obtained upon application to N. F. Dennis, A.M.Inst., C.E., borough engineer, Municipal Buildings. Tenders, endorsed "Boundary Wall," and addressed to the Chairman of the Property and Lighting Committee, are to be delivered at the Town Clerk's office, 78, Church-street, not later than 4 p.m. on Jan. 7.

Jan. 7. Hornchurch.—*Erection and completion of a fire station*, with works incidental thereto, in Billet-lane, Hornchurch, for the Town Council. The plans and specification may be seen and forms of tender obtained between the hours of 10 a.m. and 5 p.m., and on Saturday 10 a.m. and 1 p.m., of E. J. Little, architect, Longfield Gardens, Hornchurch-road, Romford. Sealed tenders, endorsed "Tender for Fire Station," are to be sent to R. G. Ward, chairman, Hornchurch Parish Council, Hornchurch, not later than 12 o'clock (noon) on Jan. 7.

Jan. 9. Landport.—*Erection of* a store at the factory of Doudney & Co., Ltd., soap manufacturers, Landport. Specifications, plans, and quantities to be seen of Cook & Tutte, architects, 394, Commercial-road. Sealed tenders to be sent by Jan. 9 to 333, Commercial-road, the registered offices of Doudney & Co., Ltd.

Jan. 9. Margate.—*Erection of Laundrymaids' Quarters* at East Cliff House, Cliftonville, Margate, in accordance with drawings and specification prepared by W. T. Hatch, M.Inst.C.E., M.I.Mech.E., Engineer-in-Chief. Drawings, specification, conditions of contract, and form of tender may be inspected at the Office of the Board, Embankment, London, E.C., and can then be delivered at the office of the Board not later than obtained upon payment of a deposit of £1. Tenders, addressed as noted on the form, must be 10 a.m. on Jan. 9.

Jan. 10. Stewarton.—(1) *Digger, brick, and mason works* in One Contract; (2) Carpenter and joiner works; (3) Slater and plumber works in connection with keeper's house, &c. (4) Plaster, cement, and rough cast works; and (5) Drainage, levelling, and road making, at Stewarton Cemetery. Plans and specifications may be seen at the Parish Council Office, Stewarton, or at the office of J and J. Armour, architects, Irvine. Schedules of measurement can be obtained from the architects on the deposit of £1 sterling. Sealed offers, marked "Offer for Cemetery," to be lodged with J. Kerr, F.S.A.A., clerk to the Parish Council, Parish Council Office, Stewarton, on or before Jan. 10.

Jan. 11. Reading.—*Erection of a new school* for 250 scholars at Swallowfield, Berks. Builders desirous of tendering are required to send in their names to the Secretary to the Education Committee, The Forbury, Reading, on or before Jan. 2, together with a deposit of £3 3s. for bills of quantities, which will be supplied by post. Plans, specification, and form of contract will be open for inspection at the Education Secretary's Office between the hours of 10 and 5. Tenders must be delivered at the office of the Education Secretary, on the form and in the envelope provided, not later than the first post on Jan. 11.

Jan. 14. Winchester.—(1) *The erection of a new school* at Totton; (2) the installation of low pressure hot water apparatus therein. Plans, specification, and conditions of contract may be seen, and bills of quantities obtained, at the office of W. J. Taylor, County Surveyor, The Castle, Winchester, between the hours of 9 a.m. and 5 p.m. (Saturdays 9 a.m. and 1 p.m.). A deposit of £2 2s. will be required for a copy of the bills of quantities for estimate (1). A similar deposit will also be required for a copy of the specification for estimate (2). Deposits must be made by cheque payable to Hants County Council and crossed Bank of England, or particulars will not be sent. Tenders, endorsed "Council School, Totton," are to be delivered to H. Barber, clerk of the County Council, The Castle, Winchester, by 10 a.m. on Jan. 14.

No Date. Ramsbottom.—*Erection of a weaving shed* at Stubbins Vale, Ramsbottom. Quantities will be sent, on deposit of £1 1s., on application to Moulds & Porritt, Victoria-buildings, Bury.

No Date. Winterton.—*Erection of three almshouses* at Winterton, Lincolnshire, for the Trustees of the late Mrs. M. Clarke. Plans may be seen at the Vicarage, Winterton, and bills of quantities obtained from Joy, Cross, & Son, solicitors, Barton-on-Humber.

ENGINEERING.

Dec. 27. Newport, I.W.—*Extension of the quay wall* on the quay at Newport, I.W. Plans may be seen and specifications and form of tender may be obtained on application at the Town Clerk's Office, 19, Quay-street, Newport. Sealed tenders, endorsed "Tender for Extension of Quay," to be delivered to T. R. Pratt, town clerk, not later than 10 o'clock a.m. on Dec. 27.

Dec. 27. London, S.W.—*Supply and fixing of electrically-driven screens* at their Pumping Stations, Durnsford-road and Kingston-road, Raynes Park, for the Corporation. Specification and form of tender may be obtained on application to the Borough Engineer, Town Hall, Wimbledon. Sealed tenders, on forms and enclosed in envelopes provided, to be delivered at the Town Hall on or before noon on Dec. 27.

Dec. 28. Widnes.—*Erection of an engine* and boiler house for the Corporation Waterworks, at their Stockswell Pumping Station. Copies of specification, conditions of contract, and bill of quantities may be obtained and the plans inspected on application to the Water Engineer, Widnes, and on payment of £2 2s. Tenders, endorsed "Engine and Boiler House," must be addressed to the Chairman of the Gas and Water Committee and delivered at the Town Hall, Widnes, on or before noon on Dec. 28.

Dec. 28. Dublin.—*Supply of 320yds. of wrought-iron railings* to enclose Recreation Ground at Dollymount, for the Improvements Committee. The railing are to be made and supplied in 6-ft. sections, having round iron bars passed through horizontal bars and rivetted underneath, in accordance with the design prepared by the City Engineer, copy of which, with a full memorandum of particulars, can be had on application to P. Tobin, secretary, any day between 11 and 4; Saturdays 11 and 1. Tenders, addressed to the Chairman, Improvements Committee, City Hall, and endorsed "Tender for Wrought-Iron Railings," must be received by the Secretary not later than Dec. 28, at or before 12 noon. Fair wages clause. The railings shall be of Irish manufacture.

Dec. 29. Melton Mowbray.—*Construction of a girder bridge*, with brick abutments, iron palisading, and road metalling, &c., complete, over the Scalford Brook, from Regent Street to Brook Street, for the U.D.C. Plans and specifications may be seen at the office of E. Jeeves, surveyor to the Council, Nottingham Street, Melton Mowbray, and applications for quantities and particulars of tendering must be sent to him not later than Dec. 29.

Dec. 31. Guildford.—*Supply of a new boiler and* heating apparatus, at the Public Baths. A plan and specification may be seen and forms of tender obtained on application to C. G. Mason, C.E., borough surveyor. Sealed tenders, endorsed "Tender for Heating Apparatus," are to be sent to F. S. Miller, town clerk, Town Clerk's Office, Bridge-street, Guildford, on or before Dec. 31, by 12 noon.

Dec. 31. Brackley.—*Sinking a well* in the Borough of Brackley. Specification and forms of tender may be obtained and plans seen at the office of the Town Clerk at Brackley, and information and any further particulars may be obtained on application to J. Eunson, C.E., Northampton. Copies of specification may be obtained on payment of £2. Tenders, upon the forms supplied, must be delivered not later than 10 a.m. on Dec. 31, addressed to C. E. Barnes, town clerk, endorsed "Tender for Well."

Jan. 2. Manchester.—*Strengthening of the Ashton Old Road Bridge*, over the Ashton Canal, and for repairs to Fairfield-street and Sackville-street Bridges over the River Medlock. Drawing may be seen and specification, bill of quantities, and form of tender obtained on application to the City Surveyor's Office, Town Hall, Manchester, on payment to the City Treasurer of £2 2s. All cheques or postal orders are to be made payable to the order of "The Corporation of Manchester." Tenders, enclosed in the official envelope, and addressed to the Chairman of the Paving, &c., Committee, to be delivered at the City Surveyor's Office not later than 10 a.m. on Jan. 2.

Jan. 3. York.—*Construction of the Selby and Goole Railway*, about 10 miles in length, for the North-Eastern Railway. The works comprise double-line railways chiefly on embankment (upwards of 1,000,000 cubic yards), with stations, station yards, warehouses, cottages, and other buildings, sidings, and bridges. The steelwork of the latter will amount to about 1,100 tons. Plans may be seen, and specification, detailed quantities, and form of tender obtained, on personal application at the office of W. J. Cudworth, Company's engineer, York. Sealed tenders, marked "Tender for Selby and Goole Railway," to be addressed to R. F. Dunnell, secretary, and delivered at his office at York not later than noon on Jan. 3.

Jan. 7. York.—*Construction of a group of carriage sidings* (about four miles in length) at Scarborough, on the west side of the Scarborough and Whitby Railway, for the Directors of the North-Eastern Railway. Plans may be seen and specification, detailed quantities, and form of tender obtained on personal application only at the office of W. J. Cudworth, company's engineer, York. Sealed tenders, marked "Tender for Carriage Sidings, Scarborough," to be sent to the Secretary at York not later than noon on Jan. 7.

Jan. 9. Worthing.—*Sinking a well* 115ft. deep, lined with iron cylinders, and the driving of headings and other works in connection therewith, for the Corporation. Plan and specification may be seen and form of tender obtained on application to F. Roberts, A.M Inst.C.E., borough water engineer and surveyor. Sealed tenders, endorsed "Tender for Well," to be sent in to W. Verrall, town clerk, Municipal Offices, Liverpool Road, Worthing, not later than 12 noon on Jan. 9.

Jan. 10. Swansea.—*A two-ton portable high pedestal* hydraulic crane with a radius of 40ft., for the Swansea Harbour Trustees. Further particulars can be obtained on application to A. O. Schenk, Mem.Inst.C.E., Trustees' engineer, at the Harbour Offices, Swansea. Tenders, sealed and marked "Hydraulic Crane," should be delivered to T. Strick, clerk, Harbour Offices, before 10 a.m. on Jan. 10.

Jan. 30. Penllwyn.—*Supplying and erecting* the steel and iron work of the proposed Rhiwarthen Bridge over the Rheidol. Plans and specifications can be seen at the office of H. Hughes, clerk to the District Council, Aberystwyth. Tenders to be sent to R. Adams, secretary to the Joint Committee, Penllwyn, Aberystwyth, on or before Jan. 30.

IRON AND STEEL.

Jan. 5. Winton.—*Erection of latrines and fencing* (wrought iron and wood) at the New Recreation Ground, Sutherland-street, Winton, for the Parks, &c., Committee of the Borough of Eccles. Plans and specifications may be seen at the office of the Borough Surveyor, where bills of quantities may also be obtained on deposit of £1 1s. Tenders must be accompanied by a fully priced out schedule, and must be made out on an official envelope which will be supplied. Sealed tenders, properly endorsed, must be left at the office of E. Parkes, town clerk, Eccles, by noon on Jan. 5.

Jan. 7. Beckenham.—*Supply of about 250 lin. yds.* of W. I. unclimbable fencing, 6ft. high, together with ornamental entrance gates, for the U.D.C. Specifications and forms of tender obtained on application to J. A. Angell, surveyor, on the production of a receipt from the Collector (who attends his office daily from 9 to 10 a.m. only, except on Tuesdays, when his hours are from 9 a.m. to 1 p.m.), for a deposit of £1. Tenders, duly sealed and endorsed "Tenders for Railings and Gates," to reach F. Stevens, clerk to the Council, not later than 4 p.m. on Jan. 7.

PAINTING AND PLUMBING.

Jan. 2. Pendoylan.—*Re-painting the iron bridge* across the River Ely near Duffryn Mawr, Pendoylan. Specification can be seen of J. Holden, A.M.I.C.E., surveyor, 20, Park Place, Cardiff. Tenders to be sent to M. Warren, clerk to the Council, Park House, Cardiff, not later than 12 o'clock noon on Jan. 2.

ROADS AND CARTAGE.

Dec. 27. Burslem.—*Making-up of Back Tellwright-street*, under the Private Street Works Act, 1892. Plan and specification can be seen, and quantities obtained, at the Borough Surveyor's Office, Queen-street, on payment of £2 2s. Fair wages clause. Sealed tenders, endorsed "Private Streets," to be sent to A. Ellis, town clerk, Town Hall, Burslem, not later than 10 a.m. on Dec. 27.

Jan. 3. Luton.—*Paving and doing other works* of private improvement in Clarendon-road and Ridgeway-road in accordance with the plans and specifications prepared by the Borough Surveyor and to be seen at his office at the Town Hall, Luton Separate tenders for each street to be received by G. Sell, town clerk, Town Hall, Luton, by four o'clock p.m. on Jan. 3.

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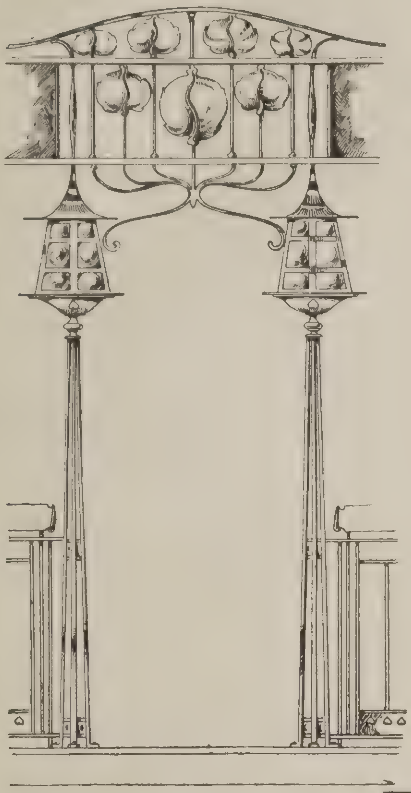

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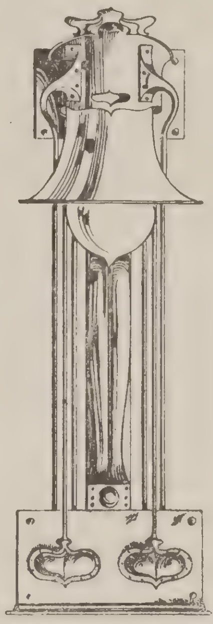

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Jan. 7. Batley.—*Levelling, paving, flagging,* and completing of each of the following streets:—Borough Road, Fleece Street, Cooper Street, Ambler Place, Fox Place. Plans, sections, specifications, and conditions of the said works respectively may be seen, and forms of tender, together with schedules of quantities and other particulars, obtained at the office of O. J. Kirby, borough engineer, Town Hall, Batley. Sealed tenders, on the forms provided, endorsed "Tender for ——," to be delivered to J. H. Craik, Town Clerk's Office, not later than Jan. 7.

Jan. 7. Erith.—*Private street works* in Alexander road, Erith, for the U.D.C. Plans and specification may be seen, and form of tender, estimate of quantities, and further particulars obtained, at the Office of the Surveyor of the Council, Bexley Road, Erith, upon payment of £1. Tenders, endorsed "Private Street Works Tender," must be received by C. H. Fry, clerk of the council, District Council Offices, Erith, Kent, not later than 4 p.m. on Jan. 7. The Contractor will be required to enter into a contract and bond, with two sureties, for the due performance of the contract. Fair wages clause.

SANITARY.

Jan. 2. Epping.—*Construction of sewage disposal works* and the laying of about 2,500 yds. lineal of pipe sewers, with manholes and contingent works in the parish of Chigwell, for the Epping R.D.C. Drawings can be seen, and further particulars and bills of quantities obtained, at the office of H. Tooley, A.R.I.B.A., Buckhurst Hill, upon the deposit of £10. Applications for bills of quantities must be made before Dec. 19. Tenders to be on the forms supplied, and sent in the envelopes provided, to R. D. Trotter, clerk, Epping, Essex, on or before 6 p.m. on Jan. 2.

Jan. 13. Kettering.—*Provision of distributing apparatus* on rectangular percolation filter beds. Full particulars of requirements may be obtained from the Council's Surveyor. Tenders to be delivered at the office of T. R. Smith, engineer and surveyor, Surveyor's Office, Market place, Kettering, not later than Jan. 13.

Jan. 19. Bexley.—*Providing and laying* about 2,079 yards lineal of 9-in. and 309 yards lineal of 6-in. best glazed stoneware pipe sewers, with manholes complete, in the Oaklands and Broadway Estates in the Christchurch Part, for the U.D.C. Plans and specifications may be seen and bills of quantities and form of tender obtained on application to W. T. Howse, surveyor to the Council, at the Council Offices, Bexley Heath, on payment or deposit of a cheque for £2 2s. Sealed tenders, endorsed "Christchurch Part Sewers, Oaklands and Broadway Estates," to be delivered to T. G. Baynes, clerk to the Council, Council Offices, Bexley Heath, Kent, not later than Jan. 19.

TIMBER.

Jan. 7. Dartford.—*Supply (at per fathom) of about 100 fathoms* of best Baltic Yellow Deal and Batten Ends for the purpose of splitting for firewood, for the Guardians of the Dartford Union. Tenders are to be delivered to J. C. Hayward, clerk, Union Offices, Dartford, on or before Jan. 7, at two p.m., endorsed "Tender for Timber." Contractors to state the earliest date at which the timber can be delivered.

Jan. 7. London, S.W.—*Supply of timber* from March 31 next, for the Wandsworth B.C. Form of tender and specifications may be obtained and form of contract seen of H. G. Hills, town clerk, Council House, Wandsworth, S.W., between the hours of 10 a.m. and 4 p.m. (Saturdays, 10 till 1). Tenders sealed and endorsed "Tender for Timber," must be delivered not later than Jan. 7. No tender will be received unless it is made upon one of the printed forms issued for the purpose.

MISCELLANEOUS.

Dec. 27. Hartlepool.—*Supply of the following goods* and materials during the year ending Dec. 31, 1907:—1. Bass brooms and ironmongery. 2. Iron castings and smith's work. 3. Oils and disinfectants. 4. Portland cement and building lime. 5. Stoneware and fireclay pipes. 6. Broken and unbroken whinstone. Specifications and forms of tender may be obtained on application to H. C. Crummack, A.M.I.C.E., borough engineer, Borough Engineer's Office, Hartlepool. Sealed tenders, endorsed "Tender for Stores," are to be delivered at the Town Clerk's Office not later than 12 o'clock noon on Dec. 27. Labelled samples of the articles tendered for must also be delivered to H. C. Crummack.

Jan. 8. Chislehurst.—*Supply of the following materials, &c.*, for the twelve months ending March 31, 1908:—Cherbourg quartzite or Quenast granite, pit flints, gravel and sand, tar, tar paving, granite kerb and setts, stoneware pipes and goods, cement and bricks, tools, sewer, and general ironmongery, steam rolling, miscellaneous materials and goods, supply of horses, carts, and harness only (the Council finding drivers and other men) for removal of house refuse. The contractors to find shoots for the disposal of the refuse. Particulars and forms of tender may be obtained on application being made at the Council Offices. No tender will be considered unless made on the Council's form. Tenders endorsed "Tender for ————" must be delivered, addressed to H. E. Knight, clerk, Council Offices, Chislehurst, not later than 4 o'clock on Jan. 8.

TOO LATE FOR CLASSIFICATION.

Jan. 1. Horsham.—*Supply of the following road materials*:—450 tons of good hard stone, broken to 1½-in. gauge; 350 yards of broken pit flints, 1¾-in. gauge; for the U.D.C., to be delivered free at Horsham Railway Station not later than March 30, in such quantities and at such times as shall be directed in writing by the Council's Surveyor; the weights and measurements to be as taken in the trucks at Horsham Station by the said Surveyor. Sealed tenders, endorsed "Tender for Road Materials," quoting a price per ton or yard, and accompanied by a small sample of the material quoted for, to be delivered to S. Mitchell, clerk, Council Offices, Horsham, not later than Jan. 1. Forms of tender are not supplied.

Jan. 7. Stourport.—Contract No. 1.—*Provision, laying, and jointing* of cast iron and stoneware pipe sewers, together with manholes, lampholes, and flushing chambers, the construction of tank sewer, engine-house, liquefying tanks, distributing carriers, effluent drains, and other incidental works, in accordance with the drawings and specification prepared by the Engineers, for the U.D.C. Drawings and specification may be seen, and bills of quantities obtained, of Willcox and Raikes, engineers, 63, Temple Row, Birmingham, on payment of a deposit of £5 5s. Sealed tenders, in the envelopes supplied, endorsed "Stourport Sewerage—Contract No. 1," to be delivered to C. H. Watson, clerk to the Council, Stourport, not later than 12 o'clock noon on Jan. 7.

Jan. 7. Leek.—*Building of coal breaker*, wagon tipper, and weighbridge pits, gas engine house, tunnel under Newcastle Road, and other appurtenant works for the U.D.C., at the Council's Gas Works, near Leek Station. Plans, sections, stipulations, may be seen, and copies of specification, the Office of W. E. Beacham, C.E., surveyor to the Council, Town Hall, Leek, upon payment of the sum of £2 2s. Sealed tenders (upon the form supplied only) and priced quantities to be forwarded under separate covers, endorsed "Buildings for Coal Handling Plant," and addressed to the Chairman of the Gas Committee, to be delivered to the Surveyor to the Council before noon on Jan. 7.

Jan. 10. London, N.W.—*Constructing, supplying, delivering*, and setting two Lancashire steel boilers to schools at Leavesden, King's Langley, Herts. Specifications and form of tender may be obtained of A. A. Millward, clerk to the Guardians, Town Hall, Pancras-road, N.W., and should be delivered to him not later than Jan. 10, endorsed "Tender for Boilers." Plans and drawings may be inspected at the Town Hall, or at the Office of the Superintendent of the Schools, at Leavesden.

Jan. 11. Londonderry.—*Heating and ventilating* the Municipal Technical School, according to plans, specification, and schedules prepared by E. J. Toyle, architect, 20, Great James Street, Londonderry. Copies of the plan may be seen and obtained from Architect on a deposit of £2 2s. Tenders will be received by J. A. Williams, secretary, Technical Instruction Committee, The Savings Bank, Londonderry, up till 3 p.m. on Jan. 11.

Jan. 14. Romford.—*Erection of four sanitary annexes* at the Workhouse, in accordance with plans and specification prepared by J. Kennedy, architect, 25, Bedford Row, London, W.C., from whom bill of quantities and form of tender may be obtained, before Dec. 29, upon payment of a deposit of £3 3s. The person whose tender is accepted may be required to enter into a bond with two approved sureties in the sum of £250 for the due performance of the contract. Sealed tenders, endorsed "Tender for Sanitary Annexes," must be sent to W. Smith, clerk, 13, North Street, Romford, on or before Jan. 14 by 4 p.m.

Jan. 22. Bampton.—*Construction of Bampton main drainage*, for the U.D.C., under the advice of their engineer and subject to the approval of the Local Government Board to the scheme. The plans, specifications, and all documents can be seen upon application at the offices of N. Lailey, M.I.C.E., F.G.S., 53, Victoria Street, Westminster, S.W., until Jan. 18, from 10 o'clock a.m. until 4 o'clock p.m., Saturdays excepted. Duplicate plants, &c., will also be on view, and particulars can be obtained upon application to E. P. Row, clerk, Urban District Council Offices, Bampton, N. Devon, during the same period. Sealed tenders, endorsed "Bampton Main Drainage," are to be sent to him on Jan. 22 by 12 o'clock noon.

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Tenders.

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Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Aldborough.—For the erection of Aldborough proposed new school, for the Norfolk Education Committee. Mr. C. J. Brown, architect, Cathedral Close, Norwich :—

R. Chapman, Hanworth ...	... £2,560
G. A. Lines, East Runton ...	... 2,525
W. G. Porter, Cromer	... 2,470
G. T. Baker, Ltd., Holt	... 2,390
W. J. Hannant, Norwich ...	...£2,300
J. McKay, Clacton-on-Sea ...	... 2,298
J. Mickleburgh, Norwich ...	... 2,295
Blyth and Son, Sheringham ...	... 2,282
J. Youngs and Sons, Norwich	... 2,187
R. Shanks, Chatteris	... 2,150
T. Blyth, Foulsham	... 2,120
T. Yelf, Norwich	... 2,094
H. G. Greengrass, Norwich ...	... 2,076
J. W. Neale, Baconsthorpe ...	... 2,070
G. Stowers, Norwich	... 2,055
R. C. Watts,* Buxton, Norfolk	... 2,035

*Provisionally accepted.

Eastville (Bristol).—Acepted for the erection of a fire and police station for the Eastville district, for the Bristol City Council :—

A. J. Colborne, Swindon ...	... £3,500

Enfield.—For the erection of an infirmary for 50 beds at The Chase Farm Schools, Enfield, for the Guardians of the Edmonton Union. Mr. Stuart Hill, architect, 106, Cannon-street, E.C. Quantities by Mr. Joseph Peebles, 7, Southampton-street, Bloomsbury, W.C. :—

S. J. Collins	... £8,500	0	0
A. Roberts & Co. ...	... 7,200	0	0
Hyde & Co.	... 7,080	0	0
Robt. Jackson & Co. ..	... 6,997	0	0
A. Faulks	... 6,986	0	0
Patman & Fotheringham	... 6,965	0	0
J. Thomas	... 6,929	0	0
F. Webster & Son	... 6,850	0	0
L. & W. H. Patman ...	... 6,780	0	0
H. Knight & Son ...	... 6,749	0	0
Leasby & Salmon	... 6,600	17	0
J. Greenwood & Co., Ltd.	... 6,57[illegible]	0	0
Rowley Bros....	... 6,558	0	0
Allen Fairhead & Son ...	... 6,497	0	0
Albert Monk	... 6,492	0	0
B. E. Nightingale	... 6,474	0	0
C. Wall, Ltd.	... 6,440	0	0
Mattock Bros.	... 6,375	0	0
W. Lawrence & Son ...	... 6,294	0	0
Fitch & Cox	... 6,264	0	0
F. & G. Foster	... 6,155	0	0

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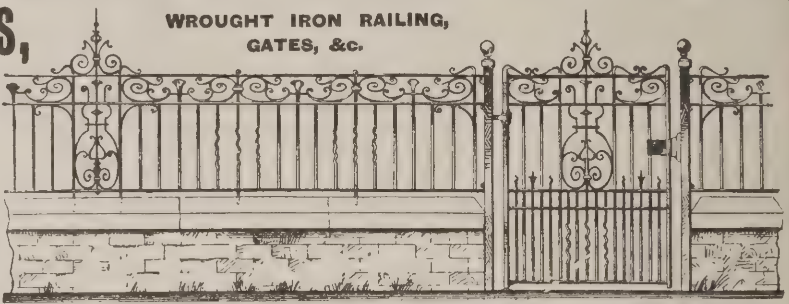

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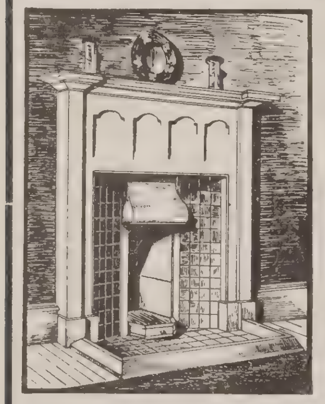

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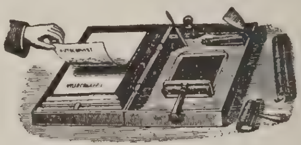

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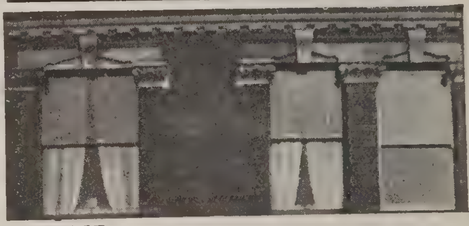

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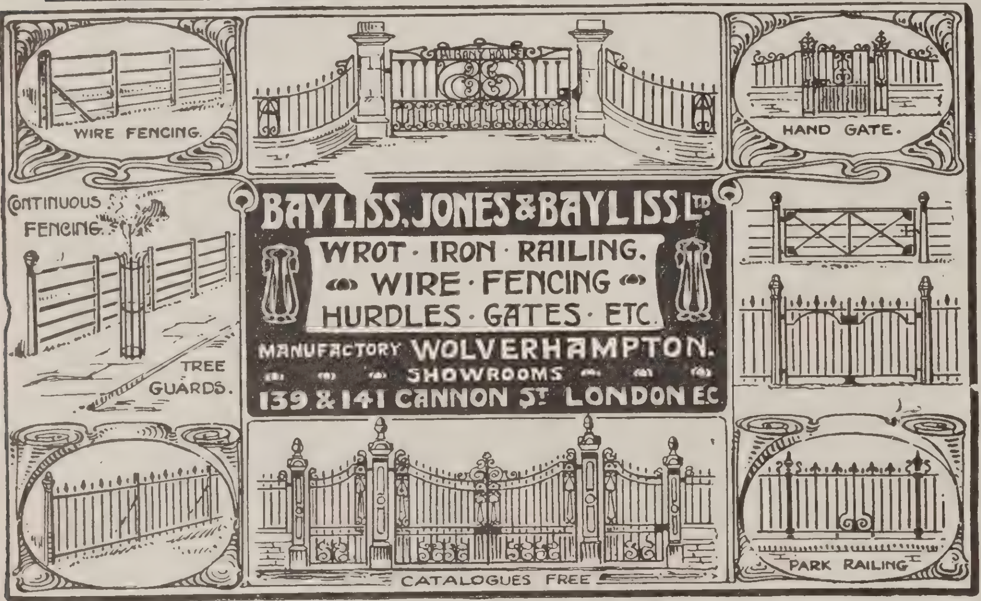
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